

**School of Economics and Finance**

**Modeling Inward Foreign Direct Investment for Jordan and Australia: A  
Comparative Study**

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**This thesis is presented for the Degree of  
Doctor of Philosophy  
of  
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## Declaration

To the best of my knowledge and belief this thesis contains no material previously published by any other person except where due acknowledgment has been made.

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university.

A handwritten signature in blue ink, appearing to read "Gitau", with a long, sweeping flourish extending to the right.

**Signature:** .....

**Date:** ...2/12/13.....

## **List of Publication from the Thesis**

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## **Abstract**

Inward foreign direct investment (FDI) and foreign indirect investment (FII) are the most significant factors of economic growth in the national economy, encouraging productivity, augmenting the use of technology, reducing unemployment by creating new jobs and other beneficial outputs that differentiate this form of investment from other funding sources. Consequently, most developing countries have realised the need for FDI and FII to increase their rates of economic growth. There is a race among Arab economies to improve their business environment in order to attract foreign investment through contemporary legislation in order to attract this form of investment and increase the competitiveness of their national economy. Nevertheless, most of these countries are still experiencing a low volume of inward FDI and FII compared to other economies. This is due to the absence of effective legislation that supports the process of attracting inward FDI and FII. For example, the imposition of higher taxes, the absence of political and economic stability in some countries, and the existence of administrative and financial corruption, diminish these countries' appeal to foreign investors. Therefore, the main objective of this thesis is that to determine of inward FDI and FII in Jordan and Australia.

Country risk is a proxy for financial and economic health and political stability. The financial health of a country includes the stability of the exchange rate, interest rate, external debt and current account. The economic health of a country includes real gross domestic product (GDP), growth, the annual inflation rate, and gross national product per head. Political stability (for example, protection of property rights, voice and government accountability, low corruption, transparency and legislation) is one of the factors influencing the inward FDI and FII flows. It is clear that greater financial and economic health and political stability lead to greater inward FDI and FII flows.

Classical trade theory suggests that the basis for international trade can be traced to differences in production characteristics and resource endowments, which are founded on domestic differences in natural and acquired economic advantages. According to product life cycle theory, FDI takes place as part of the parent firm's effort to spread its capability to extract oligopoly rents from an internal array of intangible assets in the face of on-going challenges from competitors.

The environment, system and political (ESP) paradigm Koopman and Montias demonstrates the interaction of host countries' economic environment, economic system and government policies and inward FDI and FII flows. If the host country's environment has capabilities, including a wide range of intangible assets, there are gains to be made from attracting inward FDI and FII. Also, the host country government's strategic objectives and the macro or micro measures to implement and advance these objectives within its system and environment are considered to be factors impacting on inward FDI and FII. Dunning's eclectic paradigm indicates that the extent, geography and composition of inward FDI and FII flows are determined by the interaction of three sets of interdependent variables: ownership, location, and internationalisation advantages.

In this research the determinants of inward FDI and FII in Jordan are compared with those of Australia's developed economy so as to arrive at policy implications for Jordan. Australia has an AAA international credit rating, with a well-developed, strong and sophisticated financial market, regulated in accordance with international criteria. In terms of global turnover, Australia's foreign exchange market is the seventh largest in the world and the Australian dollar/U.S. dollar is the fourth most traded currency pair globally. In 2011, Australia received over \$2 trillion in total foreign investment stock.

Internationally, several studies have concentrated on the individual impact of a country's determinants on inward FDI and FII. Previous Jordanian studies have concentrated on inward FDI, using the sub-components of political risks and trade openness. Australian empirical studies have focused on the advantages of inward FDI ownership in line with theoretical prediction and the testing of variables in various locations. This study differs from the other Jordanian and Australian studies in terms of the period of time for which data were collected, the determinant variables of inward FDI and FII, and data analysis techniques.

The current study is focused on the determinants of inward FDI and FII during the period 1996-2010 using monthly data. Also, this study analyses whether or not contemporaneous relationships differ for the three structure break periods using unlagged models in the preliminary analysis stage. This study considers all the determinant factors in Jordan and Australia including: financial, economic and

political. The degree of liberalization or trade openness is considered and stock market price. Also, the macro-economic environment is considered by controlling for interest rate and inflation.

In Jordan and Australia a number of researchers have studied the dynamic determinants of inward FDI and FII. A few of them have considered the dynamic relationship between all country risk determinants, stock market price and inward FII. Despite the fact that past studies have examined the dynamic movements between foreign investment and part of country risk determinants, trade openness and macroeconomic environment, there is no evidence showing the long-term relationship, short-term relationship and exogeneity between the variables. Past studies have used the vector autoregressive (VAR) model and Granger causality to determine the long-term and short-term relationships between inward FDI and FII and their direction of exogeneity. A limited number of studies have considered the structure breaks in the data.

One of the study's first objectives is to explore the contemporaneous relationship between the specified variables based on Jordanian and Australian data. The Autoregressive conditional heteroskedasticity (ARCH) model is used to compare and contrast preliminary findings for the entire period and for the major structural breaks between the Jordanian and Australian time series data. Based on the evidence from ARCH model for the full period from 1996 to 2010, the main determinants of inward FDI in Jordan are economic risk rate, trade openness, inflation and interest rates. During the period from 1996 to 2008, economic risk rate, stock market prices and inflation rates are found to be the main drivers of inward FDI in Jordan.

The main objective of the study is to investigate the determinants of inward FDI and FII by estimating VAR and VEC models to uncover the transmission mechanisms of the specified variables. Long-term determinants of inward FDI and FII co-movements are detected by employing Johansen cointegration tests, and the short-term determinants of inward FDI and FII dynamic is analysed by the Granger causality/Block Exogeneity Wald test with variance decompositions and impulse response function and an examination of error correction terms to investigate the time taken by the models to reach equilibrium and thus long-term exogeneity.

In the case of Australia over the full period (1996-2010), financial risk rate, political risks, trade openness, stock market prices and interest rates drive the inflows of inward FDI. In the period up to the major structural break (1996-2008), economic risk rate, trade openness, stock market prices and interest rate are the major factors driving inward FDI in Australia.

In relation to the determinants of inward FII for the entire period (1996-2010) and up to the major structural break (1996-2008), political risks, stock market prices, inflation and the interest rates are the main determinants of inward FII in Jordan. In contrast, economic risk rate, trade openness, stock market prices and inflation rates are found to be statistically significant in driving inward FII in Australia.

The main determinants of inward FDI flows to Jordan based on the long-term equilibrium relationships and ECT techniques are political stability, trade openness and inflation rate. In the short-term, financial health, economic health and trade openness are the main determinants of inward FDI flows to Jordan. According to long-term equilibrium relationships and ECT-techniques findings of determinants, economic health, stock market price and interest rate are the major factors influencing inward FII flows to Jordan. The main findings of short-term dynamic techniques are the same as those for the long-term techniques besides political stability and inflation rate.

In case of Australia, the main determinants of inward FDI flows to Australia in the long-term equilibrium techniques are economic health, trade openness, stock market price and inflation rate. The main findings of the short-term dynamic techniques are the same findings as those for the long-term techniques besides interest rate. The results of long-term techniques of determinants of inward FII in Australia indicate that financial health, political stability, trade openness, stock market price and inflation rate are the major factors driving inward FII. The results of short-term dynamic movement indicate that the determinants of inward FII are similar to the long-term equilibrium results excluding the effect of trade openness.

The study recommends that future research should attempt to use a set of data over a longer study period. It is important to understand the impact of the sub-components of country risks on foreign investment. This will provide valuable knowledge about the extent to which particular sub-components drive foreign investment and lead to

understanding more about interaction between foreign investment and the sub-components of foreign country's financial and economic health and political stability.

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## Glossary of Terms

Akaike Information Criterion	AIC
Arab Maghreb Union	AMU
Augmented Dickey Fuller	ADF
Autoregressive Conditional Heteroskedasticity	ARCH
Breusch–Godfrey	BG
Central and Eastern European Countries	CEEC
Coordinated Portfolio Investment Survey	CPIS
Consumer Price Index	CPI
Economic and Social Commission for Western Asia	ESCWA
Economic Health	ER
Error Correction Term	ECT
Export of Goods and Services	XGS
European Free Trade Association	EFTA
Europe Union	EU
Financial Health	FR
Forecast error variance decomposition	FEVD
Foreign Direct Investment	FDI
Foreign Indirect Investment	FII
Free Trade Agreement	FTA
Generalized Autoregressive Conditional Heteroskedasticity	GARCH
Greater Arab Free Trade Area	GAFTA
Greater Arab Free Trade Area Agreement	GAFTA
Global Financial Crisis	GFC
Gross Domestic Product	GDP
Hannan-Quinn criterion	HQ
Inflation Rate	INF
Interest Rate	INT
Intellectual Property Rights	IPR
International Country Risk Guide	ICRG
International Monetary Fund	IMF
Likelihood Ratio Test	LR test
Middle East and North Africa	MENA
Multinational Corporations	MNCs
New South Wales	NSW
Ordinary Least Squares	OLS
Organisation Economic Co-operation and Development	OECD
Organisation for Economic Co-operation and Development	OECD
Ownership-specific, Location-specific, Internalisation-incentive advantages	OLI
Phillips and Perron	PP
Political Stability	PR
Political Risk Services	PRS
Ramsey Regression Equation Specification Error Test	RESET
Schwarz Information Criterion	SIC
Stock Market Price	IS
Sub-Saharan Africa	SSA
Trade openness	OP
United Nations Conference on Trade and Development	UNCTAD
Vector Autoregressive Model	VAR
Vector Error Correction Model	VECM
World Trade Organization	WTO

# CHAPTER ONE

## INTRODUCTION

### 1.1 Chapter Overview

This chapter discusses the structure of the dissertation, as well as the background of the research problem and the significance of the study, including its main areas of focus and its objectives. An overview of the relevant theories and brief description of the methodology are presented. This is followed by an explanation of the types of foreign investment. The chapter concludes with a summary of the thesis content.

### 1.2 Description and Types of Foreign Investment

According to the definition provided by IMF (1993) and OECD, direct investment refers to a resident in one economy (the direct investor or source economy) gaining a lasting interest in an enterprise that is present in another economy (the direct investment enterprise). The lasting interest suggests a long-term relationship between the direct investor and the direct investment enterprise and a significant degree of influence on the management of the enterprise. The owner of 10% or more of a company's capital is considered to be a direct investor. However, when a non-resident holds less than 10% of the shares of an enterprise, this is considered to be an indirect investment. The FDI comprises not only mergers, takeovers acquisitions (Brownfield investments) and new investments (Greenfield investment), but also reinvested earnings, loans and similar capital transfers between parents and affiliates (Duce, 2003; Burke et al., 2003; and Jansen & Stokman, 2004).

According to UNCTAD (1999) FDI is categorised into three components: Equity capital comprises of the shares of companies in countries foreign to that of the investor. Reinvested earnings include the earnings not distributed to shareholders but reinvested into the company. Intra- company loans relate to financial transactions between a parent company and its affiliates. However, FII includes investments by a resident entity in one country in the equity and debt securities of an enterprise resident in another country which seek primarily capital gains and do not necessarily reflect a significant and lasting interest in the enterprise. The category includes

investments in bonds, notes, money market instruments and financial derivatives other than those included under direct investment, or in other words, investments which are both below the ten per cent rule and do not involve affiliated enterprises. In addition to securities issued by enterprises, foreigners can also purchase sovereign bonds issued by governments (UNCTAD, 1999).

The pattern of FDI can be divided into two types (Aizenman & Marion, 2004): horizontal FDI and vertical FDI. Horizontal FDI is investment in the same industry abroad as in the home country. This can occur when a multinational company produces the same product or service in multiple countries. Vertical FDI occurs when the multinational firm segments the production operations internationally, locating each step of production in the country where it can be done at the lowest cost. Vertical FDI has two forms: backward and forward. Backward FDI is investment in an industry which supplies the firm in the home country. Forward FDI is investment in an industry which buys from the firm in the home country. Therefore, vertical FDI is a strategy to establish sales and service centres for products in new markets in different countries (host countries).

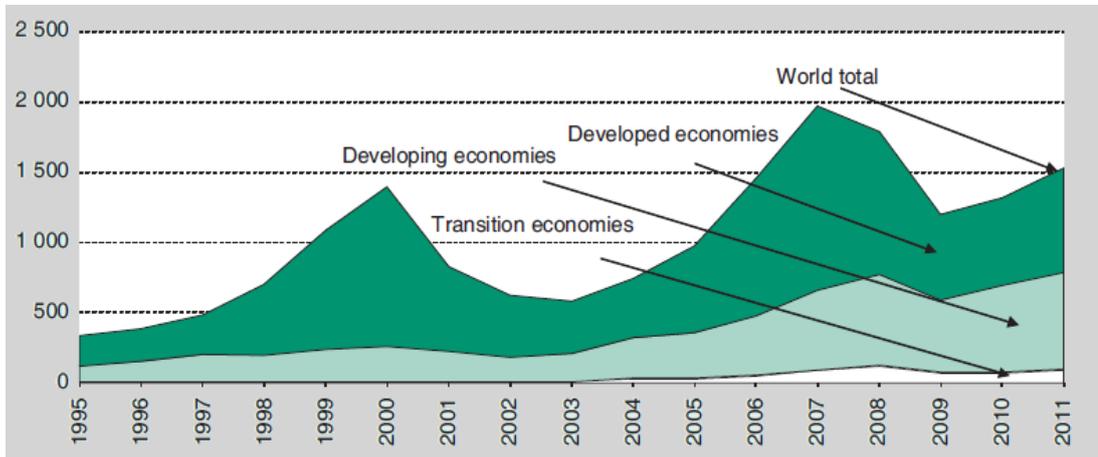
Another type of foreign investment is Foreign Portfolio Investment. This is considered to be an indirect investment (FII) by individuals, firms or public bodies; for example, national and local governments in foreign financial instruments. The inward FII is defined by the IMF (Balance of Payments Manual (1993) as equity and debt issuances, which have including country funds, depository receipts and direct purchases by foreign investors of less than 10% control. The difference between FDI and FII is that the latter is a transaction involving buying and selling of equity and debt securities in the form of bonds, notes, money market instrument and financial derivatives (Knill, 2005). The significance of the study is discussed in the next section.

### **1.3 Research Background**

The FDI inflows rose globally 16% in 2011, exceeding the 2005–2007 pre-crisis global financial crisis (GFC) level for the first time. This was despite the ongoing effects of the GFC of 2008–2009, and continuing sovereign debt crises. This increase occurred against a background of greater profits of transnational

corporations (TNCs) and relatively greater economic growth in developing countries during that year. Figure 1.1 shows the inflows of FDI in different groups of economies from 1995 to 2011.

**Figure 1.1: FDI, Inflows, Global and by Group of Economies, 1995-2011**



Source: World Investment Report, UNCTAD, (2012, 3).

The global FDI flows increased from \$1,309 billion in 2010 to \$1,524 billion in 2011 representing a 16% upward movement. However, the rise of FDI flows in developing and transition economies was driven mainly by robust Greenfield investments; whereas the growth in developed countries was due largely to cross-border mergers and acquisitions (UNCTAD, 2012).

The rise of FDI inflows in 2011 was widespread, covering all three major groups of economies (developed, developing and transition). Flows to developed countries increased by 21%, to \$748 billion. In developing countries, FDI increased by 11%, reaching a record \$684 billion. The FDI flows in the transition economies increased by 25% to \$92 billion. Developing and transition economies respectively accounted for 45% and 6% of global FDI. The UNCTAD's projections show these countries maintaining their high levels of investment over the next three years (UNCTAD, 2012).

In recent years, foreign investment (FDI and FII) has been a major driver of global economic growth. Both developed and developing countries have gained significant achievements. This foreign investment offers direct benefits to host countries, including job creation and increased tax revenue. In addition, foreign investment helps source countries, that is, those where multinational firms are based, by

allowing these firms to compete and earn profits abroad. Foreign investment is also important to the global economy as a way to finance current account imbalances.

Since the 1990s, Jordan has taken significant steps to reform its economy, and accordingly established inclusive financial, economic and political reform programs. The goal is to shape a modern country, built on a dynamic economy with extensive effort expended on growth, financial and political stability and subsequent prosperity. The improvement and enhancement of the business environment have been prioritized in order to unlock the potential for growth, changing the country from an economy based on the export of primary goods into an investment-determined, knowledge-based economy. Trade openness, privatisation of the government-owned enterprises, institutional and structural reforms, as well as the sound monetary and exchange rate policy; have positively contributed to economic environment. Such an environment has enabled high growth rates of both nominal and per capita GDP; this is in spite of the impact of major external shocks, including ongoing political instability in the region.

During the 1990s, Jordan's performance in terms of attracting foreign investment was below its potential. From 2000 to 2002, however, Jordan exceeded expectations in terms of attracting FDI. In late 2003, Jordan's economy successfully attracted a considerable amount of FDI response in anticipation of a war in Iraq. This due to Jordan becoming the only access for Iraqi imports and reconstruction effort and the home of nearly 700,000 displaced Iraqis in the aftermath of the Iraq War. The performance of inward FDI in Jordan surpassed all expectations in 2004 and 2005. Regional events, such as Iraq war and conflict between Israelis and Palestinian dictated the FDI inflows, in spite of the country's seemingly unchanged potential for attracting FDI (Mansur, 2008).

There are several factors contributed to the success of Jordan in attracting foreign investment, particularly inward FDI, which lead to registered sizable inflows of Jordanian capital financial account at \$2,358 billion in 2009. These included an abundance of regional liquidity, political stability and an attractive investment environment. The inflows of inward FDI augmented significantly from an average \$551.95 million over the period 2001-2004 to almost \$10, 89 billion in 2005-2008. According to the World Investment Report (UNCTAD, 2010), Jordan was ranked in

2007 by the UNCTAD investment benchmarking system as the sixth most attractive country for FDI, and the world's 12<sup>th</sup> most successful country in attracting FDI inflows.

Australia is also a country that has policies as examples that can be considered in this study as a comparison to Jordan as well as to enhance and improve Jordanian micro- and macro-policies. Since the 1970s, there have been major developments in every part of Australia's financial and economic policy. These developments have opened the economy to the rest of the world and supported its economic growth. Australia has a liberalised foreign investment regime, which helps it to continue protecting its prosperity in a progressively open global economy.

Other reasons for considering Australia in this study include: firstly, it has AAA international credit rating with a well-developed, deep and sophisticated financial market, regulated in accordance with international criteria. Secondly, in terms of global turnover, Australia's foreign exchange market is the seventh largest in the world, and the Australian dollar/U.S. dollar is the fourth most traded currency pair globally (Bank for International Settlements BIS, Triennial Central Bank Survey, 2010).

In addition, the total stock of foreign investment in Australia stood at almost \$2 trillion as at December 2010. Portfolio investment made up 58% of total foreign investment in Australia, while direct investment contributed 24% to foreign investment from 2005 to 2010, the world's investment in Australia grew by 59%, with FDI increasing by the same amount (NSW Trade and Investment 2011). The Australian economy retained a robust level of foreign investment in 2010 despite global economic disruption associated with the GFC.

According to Dunning and Lundan (2008), in the early to mid-1970s, the characteristics of several economic theories, including capital, trade, location and investment and the beginning of the phenomenon of international production, were reflected in two aspects of the theory on international production (Hymer, 1974; Ragazzi, 1973 and Calvet, 1981). One aspect is the micro-oriented theory (Dunning, 1976), which explains why companies choose the location of a particular

value-added activity in different host countries after comparing total costs and profits.

The other aspect is the macro-oriented theory, which suggests that companies' activities are best undertaken in different host countries because of the comparative costs and profits (Dunning, 1976). Mark (1982) argues that the theory of foreign investment consists of three theories: International capital market, theory of the firm, and the theory of trade. The integration of all three theories delivers solutions to complex foreign investment (FDI and FII) issues. The theory of international capital markets examines the origins of finance including funding, risk bearing including ownership and utilisation risks. The theory of the company deals with the issues of registration, location of headquarters, cultural affiliation and source of management. The theory of trade deals with the location of production and destination of final sales.

The theory of FDI and FII explains and analyses and explains economic production and impact issues in relation to foreign investment. In particular, the International Trade theory, Dunning's Eclectic Paradigm (OLI) and the ESP Paradigm of (Koopmans and Montias, 1971, cited in Dunning, 2008) confirm the importance of factors that are relevant in the choice of foreign investment over alternative forms of internationalisation.

#### **1.4 Significance of the Study**

There is limited research on the determinants of foreign investment (FDI and FII) in Jordan and Australia. Previous research addressed factors important to foreign investment in the Jordanian economy, such as market-seeking advantage. However, the testing of variables in these studies focuses on framework policy factors, such as corruption, institutions, quality of governance infrastructure, exports, openness ( For example, Méon & Sekkat, 2004; Habash, 2007; Bakir & Alfawwaz, 2009; Khrawish & Siam, 2010 and Sekkat, 2012). These studies provided mixed results and therefore more evidence is needed. Drawing on recent data, analysis of the financial, economic and political structure in Jordan and its international counterparts, will allow examination of the impact of rapid change since GFC.

Previous Australian studies concentrated on ownership advantages in line with theoretical prediction, but the testing of variables in these studies focused on location factors, such as market size, factor costs, transport costs and protection and risk factors, ( For example, Yang et al., 2000; Faeth, 2005b; Wijeweera & Mounter, 2007 and Iyer et al., 2009). As with the Jordanian context, more evidence is needed to analyse recent data and take structural breaks into account. For example, the effect of GFC, agreements and regional events on foreign investment are considered as structural breaks.

Despite the fact that past studies examined the dynamic movements between foreign investment and part of country risk determinants, trade openness and macroeconomic environment, there is no evidence of showing the long-term relationship, short-term relationship or exogeneity between the variables. Past studies,(For example, Wijeweera & Mounter, 2007; Constant & Yue, 2010; Pradhan & Saha, 2011 and Siddiqui & Ahmad, 2012; ) used the VAR model and Granger causality to determine the long-term relationship and direction. A limited number of studies, such as Uctum and Uctum (2011) have considered the structure breaks in the data.

This study differs from the previous Jordanian and Australian studies for several reasons, including periods of time during which data are collected, the use of determinant variables of inward FDI and FII and data analysis techniques. Firstly, the current study is focused on the determinants of inward FDI and FII during the period 1996 -2010, using monthly data. Secondly, this study also analyses whether or not contemporaneous relationships differ for the three structural break periods through the use of unlagged models in the preliminary analysis stage. Thirdly, the study considers all determinant factors in Jordan and Australia including the financial health, economic health and political stability. The degree of liberalisation or trade openness is examined by using exports and imports as a percentage of GDP, stock market price as well as the macroeconomic environment is considered by controlling for interest rate and inflation.

Fourthly, this study differs from previous studies in that it tests for dynamic balanced long-term relationships and short-term relationships. Johansen and Juselius (1990) cointegration and a VECM are used to capture long-term relationships between country risks, trade openness, stock market price and macroeconomic factors.

Granger causality Block Exogeneity Wald tests measure, impulse responses function, variance decomposition to capture the short-term dynamic relationships, and examination of error correlation terms (ECT) allows consideration of the speed of the models to equilibrium.

### **1.5 Objective of the Study**

The objective of this research is to evaluate the determinants of inward foreign investment (FDI & FII) in Jordan and Australia. It also examines the long-term equilibrium relationships and short-term exogenous relationships between inward foreign investment (FDI & FII) and their determinants. The primary research question addresses the factors that motivate, attract, and sustain foreign investments in Jordanian economy comparing to those in Australia.

The specific objectives of this research include:

- To provide an overview of inward foreign investment (FDI & FII) studies, such as International Trade theory, Dunning's Eclectic Paradigm (OLI) and the ESP Paradigm of Koopmans and Montias, in order to explain the patterns and the dynamic model of inward foreign investment in Jordan and Australia.
- To evaluate through the use of dynamic models the determinants of FDI inflows and FII the long-term equilibrium relationships and short-term exogenous relationships within Jordan and Australia.
- To examine the effects of different structure break periods using unlagged models in the preliminary analysis stage and their subsequent contemporaneous relationships.
- To provide policy recommendations to Jordan policy-makers in relation to improving Jordan's investment climate for attracting of inward foreign investment (FDI & FII).

## **1.6 Conculsion**

The main determinants of inward FDI flows to Jordan based on long-term equilibrium relationships and short-term dynamic relationships techniques are financial health, economic health political stability, trade openness and inflation rate. In relation to inward FII flow, the major factors are economic health, political stability, stock market price, inflation rate and interest rate influence such flows to Jordan. Thus, indicates of long-term political stability, such as protection of property rights, voice and accountability government, low corruption, transparency and legislations and trade openness can be used in making a decision in relation to FDI decision in Jordan.

The main determinants of inward FDI flows to Australia, using long-term equilibrium relationships and short-term dynamic relationships techniques are economic health, trade openness, stock market price, inflation rate and interest rate. Regarding the determinants of inward FII in Australia, indications of financial health, political stability, trade openness, stock market price and inflation rate are the major factors driving inward FII.

The study recommends that based on the determinants of inward FDI and FII flows to Australia, the Jordanian government should establish a regional financial service institution. This is an opportunity in a rapidly expanding domestic market, an institution ideally located for servicing markets in the Middle East time zones, supporting a regulatory environment and financial sector expertise and firmly establishing Jordan as a financial centre in the Region. Hence, the government of Jordan should take a number of initiatives to support this policy. The Jordanian Government should actively encourage and support foreign investment that is consistent with its national interest, regardless of source country, through a range of services and programs. These will be considered within the thesis. The next section describes and discusses the various types of foreign investment.

## **1.7 Organistion of the Thesis**

This thesis is organised into eight Chapters. Chapter One presents the introduction, objectives of the research and scope of the work. Also, it describes the background of inward foreign investment (FDI and FII) in Jordan and Australia from 1996 to

2010. Chapter two reviews the conventional inward foreign investment (FDI and FII) literature based on the International Trade theory, Dunning's Eclectic Paradigm (OLI) (1976) and the ESP Paradigm of Koopmans and Montias (1971). Chapter three provides an overview of the formulation of contemporaneous relationships hypotheses, dynamic long-term equilibrium relationships and short-term exogenous relationships hypotheses and constructed through the use of unlagged and lagged models. Chapter Four describes the research methodology and data collection. Chapter Five presents the results of analysed against unlagged models and discusses the research findings. Chapter Six presents the main findings in relation to the dynamic models. Chapter Seven examines the main findings of this research and its contributions to the research. Chapter Eight summarises the research findings and presents conclusions. This Chapter also acknowledge the limitations of the research, the policy implications for Jordan, and suggestions for future research.

## **CHAPTER TWO**

### **FOREIGN INVESTMENT THEORY AND LITERATURE**

#### **2.1 Chapter Overview**

Foreign investment is a significant factor in driving economic growth. It encourages productivity, augments the use of technology, and reduces unemployment. Foreign investment is widely viewed as advantageous for economic growth and job creation in the destination countries. It finances domestic investment and can be a vehicle for productivity growth through the use and distribution of advanced production techniques and management skills.

As mentioned, the IMF defines FII as equity and debt issuances including country funds, depository receipts and direct purchases by foreign investors producing less than 10% control. As with FDI, the income derived from these assets is recorded in the current account of the Capital Account Entry and will only be for any international buying and selling of the portfolio assets (Sloman, 2004). The advantages of FII include an increase in the liquidity of domestic capital markets and in the level of market efficiency. Thus, both FDI and FII provide economic benefits. Many theoretical and empirical studies have suggested various factors that influence the location choices of multinational enterprises (MNEs) and foreign investors, such as financial health, economic health, political stability and trade openness. This chapter examines international theory and literature related to inward FDI and FII and literature covering past Jordanian and Australian studies.

#### **2.2 Theoretical Structure of FDI and FII**

The international movement of large-scale capital in the form of FDI and FII is a recent phenomenon. For instance, foreign investment flows have constituted a major part of economic development over the past two decades. Given the central importance of inward foreign investment, this study seeks to contribute to the knowledge of the determinants of foreign investment by focusing on the influence of the host country's conditions. Attention to these conditions, there has been little attention given to these conditions in the past literature and previous research.

The movement of foreign investment across borders has traditionally been approached through portfolio investment at arm's length, or alternatively, the internalised investment of a multinational organisation. One of the fundamental distinctions between these two approaches is the polar implications for level of control and effect that the investing party possesses over the investee.

As international financial markets are increasingly interlinked, an emerging phenomenon is foreign investment across borders invested by direct venture capital firms in local ventures. This type of cross-border foreign investment has been recognised primarily as a non-equity capital flow. Therefore, it is not captured by the extant frameworks within the field of international business.

With regard to FII, the forecast influence of an international portfolio is restricted to welfare effects. The theoretical understanding of this form of international capital movement is covered by extensive economic theory stemming from Ohlin's ideas on interest rate differentials between economies (Ohlin, 1933, cited in Juozapaviciene & Eizentas, 2010). Even if there are some differences from the early classical definition of FII that concentrated on the acquisition of securities, The pooling of investment funds is constructed as a purely financial transaction (Dunning 1970). Despite the observation that the transaction is purely financial, the nature of these capital flows may lead to further effects. Specifically, those effects relating to the strategic and managerial requirements are sought by international capital owners.

In addition, investment activities are considered to be FDI when there is control through a substantial equity shareholding and there is a shift of the company's assets, production or sales to the host country. Nonetheless, this may not be the case, as a project may be financed totally by borrowing in the foreign economy. Thus, the distinguishing feature of FDI, in comparison with FII, is the element of control over management policy and decisions. The motivations underlying FDI and FII are developed by Casson (1937), Hymer (1960) and Caves (1971) and Dunning (1970).

### **2.2.1 History of FDI and FII Theories**

In the years prior to World War II, FDI constituted only a small share of international business. As international trade formalised the largest element of international business, international Economists focused their effort on explaining trade among nations. The Ricardian and other versions of the comparative advantage doctrine, which assumed perfect international immobility of the factors of production (thus zero FDI), were utilised to explain such trade (Hosseini, 2005). After World War II, the features of international business began to change. It was during this period of international economic history that the multinational enterprise (MNE), FDI and other forms of international production began to appear and grow significance.

International Economists adhered to the neo-classical arbitrage theory of portfolio flows to explain the unprecedented rise of FDI through the comparative advantage doctrine. According to Hosseini (2005), this theory was utilised to expound the foreign investment movement in its portfolio and not direct form. Nevertheless, portfolio theory was unable to explain FDI. Therefore, there emerged other attempts to explain FDI theory, but these the new FDI theories gradually shifted away from Economics and across to the new and interdisciplinary field of International Business. This shift could be explained by the absence of realism on the part of neo-classical theory and the complexity of the international production environment, both of which encompass more than the propositions of Classical Economics.

Historically, financial capital flows have been of interest to scholars due to their particular impacts. Examples of such roles include short-term cyclical fluctuations, financing booms and surplus pools of savings with provision of higher returns. Given the differing function of inflows and outflows to an economy, the net flow of capital was the primary focus of Economists and Scholars. These impacts were tied to the understanding that international movements of capital were a result of capital-seeking interest rate differences and that a market transaction could be approached through portfolio theory (Geroski, 1984). Indirect investment (portfolio) theory explains not only capital-seeking higher returns, but also indirect (portfolio) investments appearing as a result of the search for country or industry

diversification (Lipsey et al., 1999 ). The IMF defines foreign indirect investment (FII) as equity and debt issuances including country funds, depository receipts and direct purchases by foreign investors with less than 10% control.

The concept of control was absent from early academic research on foreign investment movements until research by Hymer (1960). This is research noted the difference between FDI and FII, emphasising the characteristic distinction between one type of investment and the other was the aspect of control over company. This control could be attributed to assets in a host economy either competition reasons or appropriate returns on skills and abilities. Thus, Barclay (2000) implies that Hymer differentiates between the hierarchical and market governance forms for the two types of foreign investment movement. In summary, there is fairly universal agreement amongst Business and Economics scholars that the defining characteristic of direct investment, as compared to indirect investment, is the intent to control.

Dunning (1970) clearly distinguishes between direct and indirect investment, and points out that the purchasing unit in a direct investment gives the power to exert control over decision-making processes within the invested-in unit. The purchase of control suggests that something other than money is generally involved in direct investment. However, these factors do not apply to indirect investments.

The FDI involves two main components. Firstly, there is the power to control decision-making in a foreign enterprise. Secondly, this power is usually accompanied by the transference of other inputs in the form of knowledge and ideas (Dunning, 1970). In Dunning's research, the main reason for highlighting this difference was to clarify the existence and characteristics of the multinational corporation (MNC). Therefore, the MNC is more strongly perceived as a disseminator of other factor inputs and/or services rather than as a provider of finance. Dunning (1970) also mentions the potential scope of consequences of capital movement, which include informal managerial or technical guidance, and dissemination of valuable knowledge/entrepreneurship in the form of research and development, production technology, marketing skills and managerial expertise.

Indeed, there is a clear distinction between direct and indirect investments in both the Economics and Business literature. This is further evident in international statistical reporting practices between indirect investments and direct investments. Indirect investments are indicated when many buyers and sellers are competing to supply or acquire standardised types of assets, with fairly well-defined prices, in markets in for bank loans, government securities, and traded company bonds and equity. However, FDI direct investment occurs when the investor owns 10% or more of the ordinary shares of a firm, and shows a persistent interest in having power over the firm.

### **2.2.2 Overview and Application of FDI and FII Theory**

Several economic theories related to foreign investment occurred in the early and mid-1970s considered capital, trade, location and international production (For example, Ragazzi, 1973; Hymer, 1974 and Calvet, 1981). There are two schools of thought regarding foreign investment. The first school is micro-oriented theory, which seeks to explain how companies choose the location of a particular value-added activity from various host countries after comparing total costs and profits (Dunning, 1976).

The second school of thought is macro-oriented theory, which suggests that companies' activities are best undertaken in different host countries because of the comparative costs and profits (Dunning, 1976). Mark (1982) argues that the theory of foreign investment consists of the theory of International Capital Market, the theory of the Firm, and the theory of Trade. The integration of all three theories delivers solutions to complex foreign investment (FDI and FII) issues. The theory of International Capital Markets provides answer in relation to the origins of finance including funding and risk bearing (including ownership and utilisation risks). The theory of the Company deals with the issues of registration, location of headquarters, cultural affiliation and source of management. The theory of Trade demonstrates the location of production and destination of final sales.

The theory of FDI and FII explains and analyses economic production and their impact on foreign investment. In particular, the International Trade theory, Dunning's (2008) Eclectic Paradigm and the Environment, System and Policy

(ESP) Paradigm of (Koopmans & Montias, 1971, cited in Dunning, 2008) confirm the importance of factors that are relevant in the choice of foreign investment over alternative forms of internationalisation.

### **2.2.3 International Trade Theory**

International trade issues are based on three questions. The first question is: What are the constructions of trade movements between at least two nations? The second question asks, what is the nature and extent of earns or losses to an economy? Finally, the third question is around trade policies: What are their on an economy? Most theories of International Trade are devoted to the first question and attention will now turn to theoretical reactions to associated questions in the form of: Classical Trade Theory, Factor Proportion Theory and Product Life Cycle Theory (Morgan & Katsikeas, 1997).

Classical Trade Theory describes the trading pattern of a country's exports and imports with other nations. The underlying basis of Classical Trade Theory is that countries are able to earn if each dedicates resources to the generation of goods and services, which give it an economic benefit (Morgan & Katsikeas, 1997). Hence, Classical Trade Theory effectively characterises a situation where a country benefits from producing goods and services for domestic consumption and thereafter exporting the surplus. In other words, it is sensible for countries to have an economic disadvantage in importing those goods and services. There are several factors responsible for the economic advantages/disadvantages that may arise from such situation this including resource endowments, labour, capital, technology or entrepreneurship. Therefore, Classical Trade Theory suggests that the basis for international trade can be sourced to differences in production characteristics and resource endowments, which are in turn founded on domestic differences in natural and acquired economic advantages.

The Theory of Absolute Advantage (Smith 1776, cited in Hill, 2004) was advanced to buttress Smith's argument that if there is no government involvement in trade processes and each individual is left to pursue his own interests, more goods and services will be available, and prices will decrease. As a result, the wealth of each nation will increase. Smith's Theory was offered to replace mercantilism. The theory

of Comparative Advantage (Ricardo, 1817, cited in Hill, 2004)) advances refines and supports Smith's Theory of Absolute Advantage. In doing so, Ricardo's (1817) extends Smith's view to the case where one of the two countries has an absolute advantage in both commodities, and shows that even in such situation trade is good for both countries (Hill, 2004).

Smith's Absolute Advantage Theory and Ricardo's Comparative Theory share similar assumptions and inherent limitations (Hill, 2004). These include consideration of simple world (two countries, two products), no transportation costs, no price differences in resources, resources being immobile across countries, constant returns to scale, each country having a fixed stock of resources and an absence of efficiency gains in resource use from trade and full employment.

According to the Factor Proportion Theory, countries generate and export goods and services that harness a large amount of abundant production factors that they possess, while they will import goods and services that require a large amount of production factors, which may be relatively scarce (Hosseini, 2005). This neo-classical Factor Proportion Model of International Trade preserved the international immobility of the factors of production assumption while assuming the production function is the same in both countries, but discounts the possibility of absolute advantage.

Hosseini (2005) claims that foreign investment decisions (FDI and FII) can be explained using the attributes of Behavioral Economics Theory and Neoclassical Trade Theory. Hosseini (2005) concludes that the Neoclassical Arbitrage Theory of portfolio flows does not capture the reality of FDI and other forms of international investment. In other words, when the risks, uncertainties and barriers are introduced to the movement of capital across nations and assumes the reality of the MNE and the possibility of cross-movement of capital, this theory is no longer applicable.

Mundell (1957) incorporates FDI into the Neo-Classical framework as the result of barriers to trade in goods. Factor prices are equalised by the movement of Capital between countries; it is exported by capital-abundant countries until the returns are equalised. If barriers to trade are then liberalised (such as via GATT post 1947),

Capital flows are not rationalised because FDI is now part of the factor endowments of the host-country - sunk and fixed costs. New FDI flows however, will reflect changes in factor prices. Trade barriers encourage FDI (or migration). Trade liberalisation neither reduces FDI nor increases trade. Restrictions on factor mobility increase trade flows. FDI is therefore shown to be a response to distortions in a perfectly competitive equilibrium. FDI (or migration) and trade are therefore substitutes.

Posner's (1961) analysis on how an initial product innovation in one country led to both cumulative technological and trade advantage resulted in the development of a set of theories around the concept of "technological gap". Posner (1961) proposed the technological gap theory based on different propensities of firms for learning and innovating, which led to the development of dynamic economies of scale. For Posner, trade advantages were the result of cumulative advantages of innovating firms that managed to gain experience in international production.

Another type of international trade theory is the Product Life Cycle Theory. Foreign investment in host countries occurs late in the product cycle model. The important insight of this model is its ability to explain the behaviour of multinational corporations (natural resource and infrastructure corporations) investing first and heaviest in foreign countries. In the Product Cycle Model, FDI takes place as part of the parent firm's effort to spread its capability to extract oligopoly rents from an internal array of intangible assets, in the face of on-going challenges from competitors (Vernon, 1979).

This work, on the part of the mother firm leads to other developed country markets where exports have already established a presence through exporting and where indigenous companies have begun to challenge those exports in meeting local demand. Vernon (1979) indicates that the willingness to maintain control over hard-to-duplicate technology and business practices explains the international firms' decision to move to other capital-intensive high-wage countries and choose the difficult route of direct investment rather than licensing to domestic companies (Moran, 2000).

The use of International Trade Theory provides identification of additional intricate foreign investment (FDI and FII) patterns. Coughlin and Segev (2000) investigate export platform FDI by exploring possible regional/spatial FDI patterns to find evidence for export platform FDI and agglomeration externalities. This is consistent with (Baltagi et al., 2007) who developed a general model of FDI for a multi-country world. It predicts how the characteristics of neighbouring countries (e.g., GDP, trade costs, endowments, etc.) affect FDI in a given host country, depending on the specific FDI motivation (horizontal, vertical, export-platform, etc.). They found mixed evidence and only weak support for export-platform and vertical interaction FDI. Eicher et al. (2012) provide evidence on the exports platform FDI theories (international trade). Export platform motivations for FDI are largely driven by differences in levels of country development, which is not surprising since export platform FDI exploits not only the proximity to other large markets, but also the cost advantage of a particular producer.

Although more realistic, the more recent theories of international trade still cannot capture the entire complexity of FDI and other forms of investments. That is, they do not attempt to explain foreign direct and indirect investment and other forms of international investment (Morgan & Katsikeas, 1997 and Hosseini, 2005).

#### **2.2.4 The Eclectic Paradigm of Dunning**

Dunning's (1980) Eclectic Paradigm offers an analytical basis for nearly all studies of international production and FDI. Its constructs are based on Internalisation Theory by including location-specific factors in various countries in order to determine foreign investment (Dunning, 1980). The Eclectic Paradigm indicates the extent to which, geography and composition of FDI are determined by the interaction of three sets of interdependent variables: Ownership, Location and Internationalisation (OLI) advantages. The Eclectic Paradigm offers an analytical framework, which accommodates a variety of operationally testable theories on FDI. While much of the academic research is dominated by firm-specific determinants of international economic activity, there is now a growing recognition of the spatial aspects of FDI and how they influence the competitive advantage of firms. The location needs of firms are not just limited to those of access to markets, resources, or knowledge intensive assets. The institutional framework of

the host country is considered to be an important location variable that influences existing ownership advantages of firms (Dunning, 1988 and Dunning & Fortanier, 2007).

According to Dunning's Eclectic Paradigm, the OLI framework considers foreign investment to be determined by the ownership, location and internalisation advantages. In other words, a firm will directly invest in a foreign country if it meets these three conditions (For example, Dunning & Dilyard, 1999; Jones & Wren, 2006 and Dunning & Lunden, 2008):

Ownership-specific (O) advantages (one nationality or affiliates of the same over those of another) and they can refer to the origin of investment. Location-specific (L) advantages (those that may favour home or host countries) refer to the direction of investment. Internalisation-incentive (I) advantages (e.g., to protect against or exploit market failure) refers to the externalisation or reasons for foreign investment. The MNE has various choices of entry mode, ranging from the market to the hierarchy examples include: (exporting, capital participation, joint venture, mergers and acquisition, Greenfield and wholly-owned subsidiary).

The Theory of Institutions postulated by North (1990), emphasises the quality of governance infrastructure of a host country. It has received attention from many academics as a means of explaining the flows of modern foreign capital (FDI and FII) across nations. The economic essence of this Theory is that, apart from the traditional macro-economic factors, other factors to consider are formal instruments and policies, such as constitutions, prudential laws and regulations, taxations, insurance and government policies. In addition, informal norms of behaviour, such as traditions, habits and customs of a foreign country affect the perception and willingness of investors to commit to foreign investment (FDI and FII) in that foreign country. Such rules and regulations limit opportunism and construct transactional trust in financial transactions eventually influencing international investors to become involved in cross-border transactions (North, 1990).

A number of studies have further documented the link between institutional quality and international capital movements. For example, Globerman & Shapiro (2002);

Acemoglu et al. (2005b); Alfaro et al. (2005) and Fan et al. (2007) argue that political, institutional and legal environments are the main determinants of FDI inflows to the host country. Globerman and Shapiro (2002) conclude that investments in governance infrastructure not only attract capital, but also create the conditions under which domestic multinational corporations emerge and invest abroad. Alfaro et al. (2005) and Fan et al.(2007) further suggest that policies aimed at strengthening the protection of property rights, reducing corruption, increasing government stability, bureaucratic quality and law and order, should be at the top of the list of policy makers seeking to increase foreign investment in poor countries.

Hill et al. (1990) explore the factors that affect foreign investors' choice of entry mode into the foreign market, these include strategic, environmental, and transaction and integrated factors within the framework of an Eclectic Theory of choice of entry mode. Hill et al. (1990) Framework of Entry Modes into Foreign Markets is consistent with a different level of control, resource commitment and dissemination risk.

Hill et al. (1990) focus on three factors to be considered in relation- strategic, environmental and transaction cost. These are: to the decision regarding entry mode. Strategic factors indicate the extent of national differences, scale economies and global concentration. Environmental factors refer to country risk, location familiarity, demand conditions and volatility of competition. Finally, transaction cost relate to the value of firm-specific know-how, and tacit nature of know-how. They indicate firms pursuing a global strategy with a high-control entry mode preference. Nonetheless, when the country risk is high, licensing and joint ventures are favoured over wholly-owned subsidiaries. According to the transaction cost logic, if the reduction in transaction costs exceeds the costs of establishing and transferring know-how, wholly-owned subsidiaries make more sense. The authors (Hill et al., 1990) point out that the relative weight of the strategic, environmental, and transaction-specific factors should be considered as part of Eclectic Theory by management decision-makers to identify, select, and influence the mode of entry.

Mallampally and Sauvart (1999) adapted Dunning and Dilyard framework (1999), in order to summarise the differences between the kinds of variables thought to affect the decision of location foreign investment. Table 2.1 shows the determinants for making a foreign investment in the foreign countries. Given the potential role of FDI in accelerated growth, economic transformation and contribution to economic development, developing countries are highly interested in attracting FDI. Therefore, developing countries are taking steps to improve the principal determinants and the location choice of FDI.

According to Mallampally and Sauvart (1999), foreign countries have begun passing legislation to liberalise their national policies and create an attractive business environment for FDI by relaxing rules and regulations in terms of market entry and foreign ownership. In doing so, they improve the standards of treatment accorded to foreign firms along with the operation of markets. However, with FDI policy frameworks becoming more similar, countries interested in attracting foreign investment inflows need to focus on measures that facilitate business. These include: investment promotion, investment incentives, after-investment services, improvements in amenities and measures that reduce the ‘hassle’ costs of doing business.

Seyoum (2009) considers Dunning’s (1980) Eclectic Paradigm from the perspective of an institutional approach and attempts to examine one aspect of institutions, corporate transparency, and its influence on inward FDI inflows. Seyoum argues higher levels of corporate transparency attract higher levels of inward FDI. Seyoum (2009) also suggests that the level of corporate transparency is a strong determinant of inward FDI flows to developing countries.

Mengistu and Adhikary (2011) use Institutional Theory to investigate the effects of six components of good governance (voice and accountability, political stability, absence of violence, government effectiveness, regulatory quality and rule of law) on FDI inflows in 15 Asian economies over the period 1996-2007. These researchers confirm that the good governance infrastructure exerts a significant and positive influence on FDI inflows. Owusu-Antwi (2012) analyses the potential determinants of FDI for Africa economies. This research highlights that African countries have not been successful in attracting significant FDI flows, likely due to

the combined effects of political and macroeconomic instability, poor infrastructure and intensification of competition for FDI flows, within a context of globalisation, lack of transparency, high protectionism and poor marketing strategies.

**Table 2.1: Host Country Determinants of FDI**

Host country determinants	Type of FDI classified by motives of firms	Principal economic determinants in host countries
<p>Policy framework for FDI</p> <p>Economic, political, and social stability            Rules regarding entry and operations            Standards of treatment of foreign affiliates            Policies on functioning and structure of markets (especially competition and policies governing mergers and acquisitions)            International agreements on FDI            Privatization policy            Trade policy (tariffs and nontariff barriers) and coherence of FDI and trade policies            Tax policy</p>	Market seeking	<p>Market size and per capita income            Market growth            Access to regional and global markets            Country specific consumer preferences            Structure of markets</p>
Economic Determinants	Resource asset seeking	<p>Raw materials            Low cost unskilled labour            Skilled labour            Technological, innovative, and other created assets (e.g. brand names), including those embodied in individuals, firms, and clusters            Physical infrastructure (ports, roads, power, telecommunications)</p>
<p>Business Facilitation</p> <p>Investment promotion (including image building and investment generating activities investment facilitation services)            Investment incentives            Hassle costs (related to corruption and administrative efficiency)            Social amenities (e.g. bilingual schools, quality of life)            After investment services</p>	Efficiency seeking	<p>Cost of resources and assets, adjusted for labour productivity            Other input costs, such as transport, communication costs to/from and within host economy and other international products            Membership of a regional integration agreement conducive to the establishment of regional corporate networks</p>

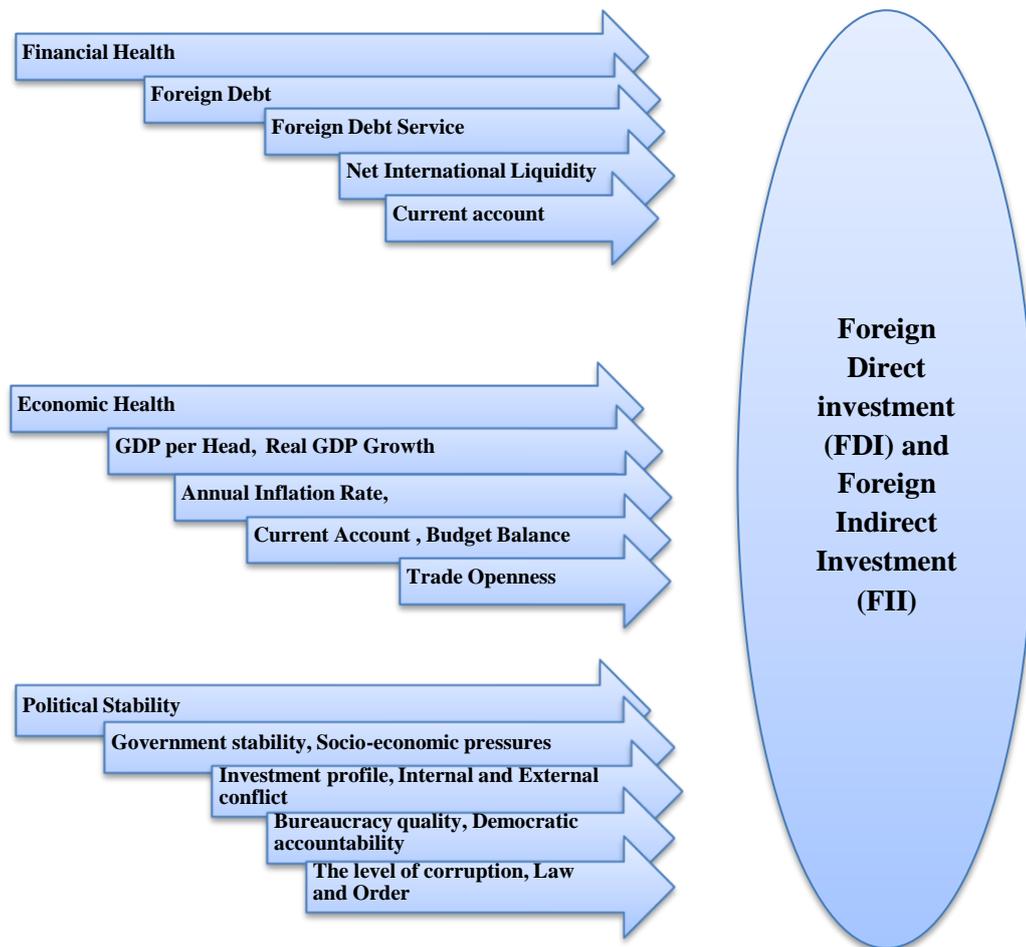
Source: Mallampally and Sauvant (1999)

In summary, the motivations of underlying FDI and FII have been examined by Coase (1937), Hymer (1960) and Caves (1971) and Dunning (1977). Generally, International Trade Theory describes the trading pattern of a country's exports and imports with other nations. Smith's Absolute Advantage Theory (1776) and Ricardo's (1817) Comparative Theory shares similar assumptions, such as no transportation cost and no price differences in resources. Another International Trade Theory is that the product life cycle theory foreign investment in host countries occurs late in the product cycle model. The Eclectic Paradigm indicates that the extent, geography, and composition of FDI and FII are determined by the interaction of three sets of interdependent variables: ownership, location, and internationalisation (OLI) advantages. The next section of this Chapter reviews the applications of using these theories in determining foreign investment in host countries.

### **2.3 The Determinants of FDI**

This section reviews the international literature regarding host countries' risks, such as financial, economic and political, in determining inward FII. It reviews the interacting behaviour of the host country's, trade openness, stock market price and the level of inward FII inflows into the host country. According to the International Country Risk Guide (ICRG) financial, economic and political risks have different components. The components of financial health (risk) for the host country are exchange rate, interest rate, external debt and current account. Economic health (risks) has different factors, such as real gross domestic product (GDP), growth, annual inflation rate, and gross national product per head. Political stability (risk) components are government stability, government quality, prominence rule of law, adequate protection of property rights, voice, accountability governance, transparency and legislation. Figure 2.1 shows the major determinants of inward FDI and FII in foreign country, such as: financial health, economic health and political stability compiled by this study as part of hypotheses formulation.

**Figure 2.1: Major Determinants of Foreign Direct and Indirect Investment**



### **2.3.1 Financial Determinants**

Financial health (risk) is an umbrella term for any risk associated with any form of financing. Typically, in finance, risk is synonymous with downside risk and is intimately related to the shortfall or difference between actual return and expected return. This section describes the relationship between FDI and the sub-components of a country's financial risk rate, such as exchange rate, interest rate risk, external debt, and current account.

Numerous studies have examined the nexus between the exchange rate and inward FDI. For example, Cushman (1985) finds a positive relationship between

depreciating host-country currency or appreciating home-country currency and home-country's outward FDI. In contrast, Goldberg (1993) finds that weaker currency in host countries discouraged FDI from other countries.

The development of a domestic financial system can measure the ability of foreign firms to borrow in order to continue their innovative activities in a host country. FDI activities are measured by the financial flow data and may be only part of the FDI to developing countries. That is, some of the investment is financed through debt and/or equity arising from financial markets in the host countries (Borensztein et al., 1998). Hence, availability and quality of domestic financial markets affect foreign investment (FDI and FII) and its impact on the diffusion of technology within the host country. This diffusion process is more effective when financial markets are better developed in the host country. As a result, this allows the subsidiary of an MNC to expand its investment once it has entered the country. Foreign investment (FDI and FII) and domestic financial institutions are complementary with respect to enhancing the process of technological diffusion, thereby enhancing the level of attractiveness of foreign investment inflows into the host country.

The development of a financial system affects the efficiency of allocating financial resources to investment projects. Additionally, investment linked to the promotion of existing, or implementation of new, technologies is more risky than other investment projects. Financial institutions may help to diminish these risks and motivate domestic entrepreneurs to undertake upgrading of existing technology or implement new technologies adopted by foreign firms (Huang & Xu, 1999). The more developed the domestic financial system, the greater the capacity to reduce risks associated with investment in upgrading old and adopting new technologies and subsequently attracting capital flows (Huang & Xu, 1999). Therefore, financial institutions positively affect the speed of technological innovation, thereby enhancing economic growth.

Financial markets play a major role in influencing inward FDI and FII flows into an economy. Wurgler (2000) defines the roles of financial markets and institutions as providing a sideshow to the real economy, thus, performing a fundamental allocation function. In doing so, they allocate resources to the sectors that need

them and can produce an adequate return on them. Financial market development involves: Improving in production of exchange information about possible investments; monitoring investments; implementation of corporate governance, trading, diversification and management of risk; mobilisation and pooling of savings, and exchange of goods and services.

The area of interest rate risk and inward receives extensive attention in the literature. For instance, Farrell and Sturm (2000) review the annual data of manufacturing industries in 16 countries for the period 1984-1995, and identified the determinants of Japanese FDI. Farrell and Sturm (2000) report that a negative interest rate significantly impacts Japanese FDI. This means that Japanese's FDI is strongly linked to domestic macroeconomic conditions and the size of the host country's market. In addition, the authors find that the relationship between exports and FDI depends very much on the industry and country in question. They also find a robust positive relationship between imports and FDI. In part, this suggests that FDI may have been motivated by the need to diversify and invest in industries in which Japan has comparative disadvantages. Pan (2003) explained the influence of host country factors, such as interest rate and inflation on inward FDI in China between 1984 and 1996. Pan maintains that firms in countries with low interest rates enjoyed a cost advantage, enabling them to raise more capital with a lower burden of interest payment. This means the cost of borrowing in the source country has a negative association with its inward FDI in China.

A low interest rate has the effect of decreasing the inward FDI. Mencinger and Zcirc (2003) explored the relationship between inward FDI and eight European countries. The researchers used cross-sectional data from 1994 to 2001. Mencinger and Zcirc (2003) suggest that the current account and FDI are strongly linked; that is, a greater amount of inward FDI into a country increases its current account deficit and foreign debt. Moreover, Bevan and Estrin (2004) examined the effects of interest rate differences between the source and host countries on FDI, ranging from Western to Central and Eastern European countries. Those researchers find that interest rate has a negative effect on FDI. Onyeiwu and Shrestha (2004) find that interest rate is one of the determinants of inward FDI in Africa. In this context, a high interest rate creates a wider gap between the domestic rate of interest and the

world interest rate and increasingly affects inward FDI to the region. Thus, if the cost of borrowing in the home country is lower than in the host country, home country firms can have a cost advantage over host country rivals, and are in a better position to enter the host country market via FDI.

KunMing and Chia-Ching, (2006) examined the effect of exchange rate, sunken costs and host country wage rate on the movement of FDI, by employing a real option model. They find that, while depreciation of a host country's currency tends to stimulate FDI activity of cost-oriented firms, depreciation tends to deter FDI activity for market-oriented firms and vice versa. For example, in the case of the forest products industry, a strong U.S. dollar increased the outward FDI from U.S.

Naceur et al. (2007) note that the existence of an equity market is important for several reasons. Firstly, it provides investors with an exit mechanism; secondly, it attracts foreign capital (FDI and FII) inflows; thirdly, it provides important information that improves the efficiency of the financial system; and fourthly, it provides for the valuation of companies. Zakaria (2007) examined the causal relationship between inward FDI and financial development in 37 developing countries in a multivariate framework. The research used two categories of financial development credit markets and equity markets to carry out causality tests based on a multivariate model. Analyses of data to findings that there is a bi-directional causality between inward FDI and development of domestic stock market in the developing countries. The significant reverse causality from stock market development to inward FDI indicates that the existence of a better developed stock market is imperative for attracting capital flows (FDI and FII).

The above consistent with the findings of Kholdy and Sohrabian (2008) in their research exploring the Granger causality links between inward FDI, financial markets, corruption and political risks. The research considered annual data from 1976 to 2003 for a group of 22 developing countries. The researchers used the ratio of net inflow of investment to GDP to measure inward FDI and focus on liquid liability and bank credit and private sector credit to measure the financial development the finding of the research suggest that there is a reverse causal link between FDI and financial development; further it is bi-directional and likely that the development of financial institutions in a country can attract more FDI.

Ciprian and Mihai (2008) studied the behaviour of FDI in Romania and its external debt using an autoregressive model. The researchers reported that the increase in Romanian external debt led to more inward FDI, meaning that FDI dominates foreign borrowing as a tool to increase domestic investment in the country. A few years later, Azam and Lukman (2010) investigated the factors that discourage and encourage inward FDI in Pakistan, India and Indonesia. The researchers used secondary time series data for the period 1970 to 2005. In this research, it was concluded that the impact of external debt has a significantly negative impact on inward FDI. Therefore, the external debt burden acts as a disincentive for inward FDI in a host country.

Theoretical predictions for the effect of exchange-rate volatility on FDI are also offered in the literature. Schmidt and Broll (2009) studied the impact of exchange rate uncertainty, exchange rate movements and expectation on FDI by using a gravity model. According to these researchers, while a standard exchange rate risk measure reveals a discouraging effect on FDI outflows in all industries, the alternative risk specification shows a clear distinction. That is, in manufacturing industries, there is a negative relationship between increased exchange-rate risk and FDI flows and in non-manufacturing industries there is a positive relationship.

Grossmann et al. (2009) examined the link between inward FDI and exchange rate. The study covers the United States and seven developed countries during the period 1994-2004. The researchers obtained data from DataStream and the Bureau of Economic Analysis. They find that an increase in United States inward FDI is related to a strengthening of an under-valued and over-valued United States dollar. However, an increase in United States outward FDI (foreign inbound FDI) is mainly related to a strengthening of an over-valued foreign currency.

Ang (2009) examined the causal relationship between FDI, growth and financial development empirically in Malaysia from 1965 to 2004, considering the relationship between FDI and financial development in the process of economic development. Applying different econometric techniques, such as VAR, VECM and Grange causality, Ang concluded that a more developed financial system facilitates the benefits of FDI into the host country.

Salman and Hui Xiao (2009) investigated the behavioural relationship between FDI in Pakistan and current account over the period, 1971-2005, and find a long-term relationship between FDI that country and the current account deficit. Further, they find that an 11% increase in FDI causes a double increase in the current account deficit, amounting to a negative relationship between FDI and current account. The authors show a negative correlation of current account balance with FDI, meaning that the Pakistan's FDI has been long the prime factor in creating the current account deficit in the economy. In other words, the relationship of FDI and current account balance has been negative.

Jongwanich (2010) investigated the nexus between inward FDI and exchange rate in emerging Asian countries. The researcher used a dynamic Panel Data Model for the period 2000-2009 and finds that the increasing importance of merger and acquisition activities in FDI improves the level of FDI inflows. This is consistent with the findings of Rasciute and Pentecost (2010) who concluded that the exchange rate is a potentially important determinant of FDI as it affects the relative cost of production.

Azam and Lukman (2010) find that the impact of external debt has a significantly negative impact on inward FDI and, therefore, the external debt burden acts as a disincentive for inward FDI in a host country. Additionally, Gwenhamo (2011) examined the relationship between external debt and inward FDI in Zimbabwe for the period, 1964-2005, and find that the ratio of external debt to GDP in that country has significant and negative long-term coefficient effects on inward FDI. These findings indicate that an increase in the government's external debt burden increases the likelihood of balance of payments problems. That is, support is found for the contenting that increasing the government's external debt burden results in uncertainty in terms of future policy regarding foreign capital, which will in turn discourage FDI. Indeed, a large government external debt burden may be an indication of weak or poor microeconomic policies.

Nagubadi and Zhang (2011) analysed the extent to which the exchange rate influenced bilateral FDI in the United States and Canadian forest industry. The researchers also used panel data analysis methods on data drawn from the period, 1989-2008. They find that bilateral FDI is positively influenced by the depreciation

of the host country's real exchange rates and exchange rate volatility. This was supported by the conclusion reached by Uctum and Uctum (2011) who examined the effects of a macro-economic determinant. That is, the exchange rate, on inward FDI in Turkey. Uctum and Uctum concluded that inward FDI depends on the exchange rate. Moreover, Turkey's exchange rate has positive and significant effects on FDI. Hence, a depreciation of Turkish currency helps to increase FDI inflows, because this decreases the cost of production in terms of foreign investor's currency by more than the decrease in profit margins caused by the valuation effect.

Dutta and Roy (2011) researched the relationship between the role of political risk, inward FDI and financial development in group of 97 countries over a 20 year period. They find that financial development led to greater FDI inflows up to a certain level. Beyond that, the relationship became negative. However, with strong political stability, the negative impact set in at relatively higher levels of financial development. Thus, the co-existence of competent financial markets and political stability is absolutely essential to maximise and utilise the benefits of FDI.

Cuyvers et al. (2011) examined the determining factors that influence inward FDI in Cambodia by referring to its characteristics of business environment. The researchers used exclusive unbalanced panel data sets, drawn over a period of 1995-2005. The researchers find that the exchange rate had a positive and significant sign related to inward FDI in Cambodia. Thus, a real depreciation in Cambodia possibly leads to an increase in inward FDI, because a depreciation of the United States dollar makes assets cheaper in Cambodia, thereby providing an incentive for foreign investors to buy Cambodian assets. Furthermore, a depreciation of the U.S dollar would make goods produced in Cambodia relatively cheaper than the same goods produced in the home country. This conclusion supports Wei (2001) findings; they indicate the economic link between FDI and cost of borrowing. This specifies that a lower cost of borrowing in the home country than in host country gives the home country firms a cost advantage over their rivals in the host economy.

Takagi and Shi (2011) analysed the effects of exchange rate movements on FDI. The researchers used Japanese panel data inflow to examine nine dynamic Asian economies. The study analysed data drawn over period of time from 1987-2008.

They find that the level of exchange rate has a negative effect on foreign investment (FDI and FII).

Lee and Min (2011) focused on the effects of exchange rate movements and volatility on inward FDI. In their research, using extensive panel data analyses to obtain consistent estimators in the presence of omitted variables and in the absence of validated instrument variables. The researchers used two empirical models to address structural change a two group model and a crisis dummy variable model. They concluded that the change in FDI in response to exchange rate volatility is robust, while that to exchange rate level is quite mixed.

Pradhan and Saha (2011, 120) studied the drivers of FDI in seven SAARC countries over the period, 1980-2010. The researchers used a panel VAR model. Based on the estimated results of cointegration tests, they concluded that there is cointegration between FDI and the current account balance. This indicates a long-standing relationship between FDI and the current account and causality. This is consistent with Siddiqui and Ahmad, (2012 ) findings, who also considered the long-standing relationship between FDI and current account by using econometric techniques. The researchers examined quarterly data for the Pakistan economy for the period 1976-2005. They maintain that FDI and the current account are cointegrated and there is indeed a long-standing balanced relationship. That is, inward foreign direct and indirect investment in a host economy has a negative relationship with its current account. Table 2.1 shows a summary of foreign country's financial health influence on the movement of inward FDI.

**Table 2.2: A Summary of Previous Studies' Financial Key Findings on the Determinants of FDI**

Authors	Determinants of FDI	Methods	Effect (+,-)
<b>Financial Risks</b>			
<b>Exchange Rate</b>			
Cuyvers et al. (2011)	Exchanger rate, GDP, real exchange rate, trade, inflation, political risks, labour productivity	Pooled OLS, fixed-effects (FE), and random effects (RE) estimations.	Negative
Takagi and Shi (2011)	Exchange rate, exchange rate volatility, GDP growth, trade openness, labour cost	Parsimonious model	negative
Lee and Min (2011)	Exchange rate, exchange rate volatility, government stability, investment profile rating, exports, imports, trade openness, tax, GDP	Unobserved effects panel model	negative
<b>Financial Risks</b>			
<b>Interest Rate</b>			
Bevan and Estrin (2004)	Interest rate, unit labour costs, gravity factors, market size, country risks, GDP	OLS	Negative
Onyeiwu and Shrestha (2004)	Real interest rate, GDP Growth rate, inflation, openness of the economy, international reserves, external debt, taxes, political rights, infrastructures, Natural Resource Availability	Fixed Effects Model	negative
Tolentino (2010)	Interest rate, trade openness, exchange rate, exchange rate volatility	VAR, Granger, Variance decomposition	Negative
<b>Financial Risks</b>			
<b>External Debt</b>			
Ciprian and Mihai (2008)	Foreign debt, GDP	Autoregressive Models	Negative
Azam and Lukman (2010)	Market size, external debt, domestic investment, trade openness, physical infrastructure	Log linear regression model, method of least squares	Negative
Gwenhamo (2011)	The external debt to GDP ratio, capital intensity, political instability, educational levels	Multivariate co-integration framework	Negative
<b>Financial Risks</b>			
<b>Current Account</b>			
Wyk and Lal (2010)	Current account deficits, economic growth, trade openness and less restrictive business regulations	Pooled least squares regressions	Negative
Pradhan and Saha (2011)	Current account balance, economic growth, exchange rate, inflation, labour population, trade balance and long term debt outstanding	VAR	Negative
Siddiqui and Ahmad (2011)	Current account	Co-integration technique and Granger causality	Negative

### 2.3.2 Economic Determinants

The level of economic health (risk) can be ascertained by assessing a country's economic strengths and weaknesses, including real gross domestic product (GDP), growth, annual inflation rate, and gross national product per head. A summary of key findings from previous research on the determinants FDI are presented in Table (2.3). Trust and confidence of investors have an influence on FDI. That is, the awareness of investors about monetary and government fiscal policies and the macroeconomic stability of a country (Brewer 1993, Kruger & Dunning 2002, and Acemoglu et al., 2005b). Previous studies find that economic risk is an important variable for foreign investors to consider in order to make a decision to invest in a

host country. Asiedu (2002) analysed the determinants of FDI inflows to developing countries and put forward an explanation to why Sub-Saharan Africa (SSA) has been unsuccessful in attracting FDI despite policy reform. She concluded that trade openness promotes FDI to both SSA and non-SSA countries, but the marginal benefit from increased openness is less for SSA.

The above suggests that trade liberalisation will generate more FDI to non-SSA countries than to SSA countries. Neumayer (2005) proposed that countries more open to trade have higher inflows of foreign investment. This was further considered by Ang (2008) who studied the determinants of FDI for Malaysia to inform analytical and policy debates. He finds that an increase in the level of financial development infrastructure development and trade openness promotes FDI. Alfaro et al. (2004) examined the links among FDI, the financial market, economic growth and finds a positive and significant relationship between them.

Rammal and Zurbruegg (2006) selected the annual inflation rates (measured as a function of the local consumer price index) as one of the control variables frequently examined in the FDI literature. They argued their findings supported, that a higher inflation rate in a host country would be a disincentive to invest in that country. Their research identified a negative relationship between annual inflation rate and FDI. This means that an increase in the inflation rate lessens FDI in the host country.

This is supported Hasen and Gianluigi (2007) findings, who studied the determinants of FDI inflows to Arab Maghreb Union (AMU) countries. They used a set of data from 1990-2006 and applied simultaneous equation regression. They state that the annual inflation rate has a negative effect and significance, which explains why Maghreb countries attract FDI less than other countries at a similar stage of development.

Several researchers have investigated the relationship between the host economy's GDP and inward FDI. For example, Asiedu (2006) finds that the size of a country's market measured by GDP, is a key determinant of FDI inflows. This is supported by the findings of Blonigen et al. (2007) who conducted a general examination of spatial interactions in empirical FDI models using data on United States outbound

outward FDI activity. Blonigen et al. (2007) proposed that a host country's GDP has a positive and statistically significant effect on foreign investment. Further, they concluded that GDP and surrounding market potential have identical effects on FDI activity.

Jinjarak (2007) explored FDI and macro-economic risk for each United States multinational industry by measuring the vertical FDI share as a ratio of exports to a parent country relative to local sales by foreign affiliates. He finds that FDI activities of US multinationals in industries with a higher share of vertical FDI responded more disproportionately to the negative effects of macro level demand, supply and sovereign risks.

Conversely, Lim (2008) collected the IPA data through questionnaires in 68 countries where the Korean KTIPA maintains an overseas office, along with macro data from published sources, conducting a series of path analysis with maximum-likelihood estimation. Lim finds that establishing an investment promotion agency is an effective way to attract FDI flows.

Further, Kenisarin and Andrews-Speed (2008) identified quantitative relationships between levels of FDI per capita and three sets of indicators relating (governance, economic freedom and perception of corruption). The researchers concluded that the level of FDI in the former states of the Soviet Union had been significantly determined by a planned economy moving towards a market economy. Azémar and Delios (2008) examined the effect of corporate taxes on FDI in developing countries and finds a strong negative correlation between FDI and corporate tax rates.

Trevino et al. (2008) argued that the level of inflation in 16 Latin American countries is negatively associated with their level of inward FDI. They employed a fixed effects model, using several indices of institutional change and covered a 31-year period 1970-2000. The researchers' findings did not support the relationship between a lower level of inflation rate in host Latin American economies leading to a greater level of FDI.

According to Dunning & Lundan (2008) and Bitzenis et al. (2009) economic variables, such as GDP are considered to be most important in determining FDI.

Azam and Lukman (2010) later studied the impact of different economic determinants on FDI for Armenia, Kyrgyz Republic and Turkmenistan, analysing secondary data drawn from 1991-2009 and through a simple econometric model (log least squares technique). This study indicated a positive relationship between FDI and GDP in the host economy.

Constant and Yue (2010) examined the long-term relationship between FDI and trade openness in the Côte d'Ivoire for the period 1980-2007. These researchers used a cointegration approach and the VAR Granger causality Block Exogeneity Wald tests. They concluded that a long-term relationship between the FDI and trade openness, and the Granger causality Block Exogeneity Wald test supported a unidirectional causal relationship running from FDI to trade openness.

Studies have also analysed the impact of trade openness on foreign investment inflows to a host country. Babatunde (2011) investigated whether trade openness in the SSA region enhanced the record in terms of FDI attractiveness. A fixed and random effect model was used to examine the data from an unbalanced group of 42 SSA countries between 1980 and 2003. Babatunde (2011) finds that trade openness (exports and imports) encouraged the inflows of FDI in the sample and there is a positive and statistically significant relationship between trade openness and FDI.

Tekin (2012) examined Granger causality between real GDP, real exports and inward FDI in least-developed countries between 1970 and 2009. Tekin finds a Granger causality running from FDI to real exports in Benin; however, real exports Granger cause inward FDI in Haiti. Trade openness and economic liberalisation were two of the factors that increased the attractiveness of foreign direct and indirect investment to foreign economy in Tekin research.

Gohou and Soumaré (2012) analysed the relationship between FDI and GDP per capita. The researchers used a sample of five African free-trade areas over the 1990-2007 period. The researchers used panel data regression and concluded that the real GDP per capital and FDI have a positive bi-directional relationship. Indeed, the inward FDI had a positive relationship with the host economy's GDP. Thapa and Poshakwale (2012) used data of approximately 4600 observations from 36 countries, both developed and developing, over the period 2001-2009. They find

that a positive and statistically significant relationship existed between foreign equity portfolio allocation and GDP growth. Table 2.1 shows a summary of foreign country's economic health influence on the movement of inward FDI.

**Table 2.3: A Summary of Previous Studies' Economic Key Findings on the Determinants of FDI**

Authors	Determinants of FDI	Methods	Effect (+, -)
<b>Economic risk</b>			
<b>Macroeconomic Risk</b>			
Lim (2008)	GDP, market size, market growth, and low labour costs, investment promotion agency, trade openness	Structural equation analysis	Positive
Kenisarin & Andrews-Speed (2008)	GDP, governance indicators, economic freedom, corruption	OLS	Positive
Azémar and Delios (2008)	GDP, market size, trade openness, exchange rate, distance, public goods, institutions	Passion regression model	Positive
<b>Economic Risks:</b>			
<b>GDP</b>			
Bitzenis et al. (2009)	Bureaucracy, tax, corruption, labour market structure, legal framework, macroeconomic stability, political violence	Qualitative methods	Positive
Azam (2010)	GDP, market size, inflation, official development assistance	Least squares technique	Positive
Thapa and Poshakwale (2012)	GDP, market size, transaction cost, market liquidity, local equity market volatility, exchange rate volatility	OLS	Positive
<b>Economic Risks:</b>			
<b>Inflation</b>			
Hasen and Gianlulgi (2007)	Inflation, Market size, trade openness, real exchange rate, corruption and bureaucratic red tape, economic stability, political stability	Simultaneous equation regression	Negative
Trevino et al. (2008)	Inflation, currency valuation, market size, trade, educational attainment, bilateral investment, privatisation, political constraints, tax reform, trade reform, financial account liberalisation	Fixed-effects model	Negative
Asiedu and Lien (2011)	Inflation, trade, corruption, law order, bureaucracy, conflict, instability of government	linear dynamic panel-data model	Negative

### 2.3.3 Political Determinants

Political risk pertains to risks stemming from socio-political factors, such as the changes in government control, social fabric, or other non-economic aspects. These categories cover many different factors that vary from one rating agency to another. However, most rating providers, such as the International Country Risk Guide (ICRG), Political Risk Services (PRS), Moody's and Standard and Poor's refer to major components. These include: government stability, government quality, rules of law and adequate, protection of property rights, voice and accountability government, transparency and legislation. Insurance exists for some political risks and can be obtained from a number of government agencies and international organisations. The political risks posed by a host country play a major role in

foreign investors' decisions to invest abroad. Therefore, developed and developing countries work hard to attract more inward FDI by meaning their political risks.

The FDI is responsive to a country's political conditions, which means that the country with institutional efficiencies, prudential laws and regulations for the purpose of protecting the property rights and civil rights of investors, can be more effective at attracting FDI (Guy V.G 2000). Multinational enterprises and foreign investors rely on many theoretical and empirical studies dealing with the factors that influence decisions and location choices for investment abroad. Some are firm-level characteristics, while others are country-level characteristics, which in turn can be either host country characteristics or home country characteristics. For example, several studies (For example, Harms & Ursprung, 2002; Globerman & Shapiro, 2003; Rui, 2003; Shapiro, 2003; Busse, 2004; Acemoglu et al., 2005b and Li & Filer, 2007) find that MNFs are more likely to be attracted to a democracy.

Harms and Ursprung (2002) used data from 62 developing and emerging-market countries over the period 1989 and 1997. They used a fixed-effects panel regression and concluded that foreign investors are attracted by regimes that offer a high degree of political and economic freedom; however characteristics, such as free media and personal social freedom and so on are of secondary importance.

Measurements of political stability might include the frequency of changes of government, or the level of violence in the country, (such as violent deaths per 100,000 head of population), number of armed insurrections and conflicts with other countries. The purpose of these stability indicators is to predict how long the current government will be stable in power and whether that government is be willing and able to honour its foreign investment agreements. Most companies believe that greater political stability means a safer investment environment (Shapiro, 2003). Government stability ratings are an assessment of a government's ability to remain in office and carrying out declared policy plans. The sub-components of this factor are government unity and legislative strength. .

Investment is a forward-looking activity based on investors' expectations for future returns and the confidence that they can place on receiving these returns. Therefore, the foreign investor's decision involves some assessment of the political

future of the host country. Government instability is a type of risk faced by foreign corporations and can be defined as the risk of a strategic, financial, or personnel loss for a foreign company due to events related to political instability. For example, insurrection, civil war, coups, riots, and terrorism are some of the factors that cause government instability, as well as non-market factors, such as social policies and macro-economics. Factors from industrial nature, as well as income, labour, fiscal, monetary, trade, investment and development can also contribute to government instability. It is a risk that can be understood and managed depending on ability to accurately foresee future events and plan investments accordingly.

Globerman and Shapiro (2003) contend that foreign investors prefer to invest in countries where there is a rule of law and evident protection of property rights. According to these researchers, the legal system and its legislation and regulation was a key determinant of both location and amount of US FDI flow to 144 countries from 1995 to 1997. However, Globerman and Shapiro study has limitations, one of them being that the estimation of a precise relationship between environmental policies and FDI flows is hampered by multicollinearity.

Similarly, Nunnenkamp and Spatz (2004) explained the intellectual property rights IPR-FDI linkage, using sectorally disaggregated FDI stocks data from a sample of 166 host countries. The researchers reported that the significantly positive coefficient of interaction term reveals that IPR has become more important for foreign investors. This is consistent with Beata's (2004) findings, in research that investigated the effect of intellectual property rights (IPR) on the composition of FDI for Eastern Europe and the former Soviet Union. Beata analysed a unique firm-level data set description drawn from the EBRD Foreign Investment Survey. The Beata's study provides some evidence that weak IPR discourages FDI flows to the host country, whereas countries with a poor legal system and little public protection of property rights attract less FDI.

Busse (2004) also argued that the level of democracy affects FDI. Busse used data from a sample of 69 developing and emerging market countries, and conducted cross-sectional analysis to determine the link between FDI and democracy. Busse's study covered the period from 1972 to 2001, and also highlighted that the enhancement of democratic institutions (for example, freedom of expression,

selection the government, and political rights) is positively associated with higher FDI inflows per capita for the country and period sample.

Generally, regulations are used to construct detailed arrangements, which give effect to the intent and purpose of primary legislation. Foreign economy tends to regulate a high quality of foreign investment legislation abroad such as protection law and friendly business environment to attract foreign investors' attention to invest. Several studies document that investment conditions in a host country matter for FDI decisions to invest abroad. Most of these studies (Bevan & Estrin, 2004; Carstensen & Toubal, 2004 and Görg, 2005) find that countries characterised by low political risks tend to have higher FDI inflows.

Bevan and Estrin (2004) researched the determinants of FDI inflows to Central and Eastern European Countries (CEEC), analysing data on FDI flows from 18 market economies to 11 transition economies over the period, from 1994 to 2000. Bevan and Estrin state that economies that successfully transition policies were promised relatively speedy EU membership, which further attracted FDI that, in turn, produced growth and development.

There is a discrepancy between these findings and those of Carstensen and Toubal (2004) latter researchers used a dynamic panel model to identify the factors that encourage and impede FDI flows from Organisation for Economic Co-operation and Development (OECD) countries to seven transition countries in CEEC. Carstensen and Toubal (2004) contend the significant influence of country risk showing uncertainty in relation to the legal, political and economic environment as an important deterrent to FDI. Further, Egger and Winner (2005) explored the relationship between corruption and inward FDI by using general equilibrium models and data from 73 developed and less developed countries. They find a strong positive relationship between corruption and FDI, the implication being that corruption is a stimulus for FDI. In other words, As long as the national government turns a blind eye allowing the company to come clean after a corrupt dealing – conducted either via a joint venture partner or a foreign employee, corruption in the host country may very well increase the likelihood of foreign direct investment.

Görg (2005) hypothesised that labour market regulation is important for the location of US outward FDI stocks in manufacturing. The study analysed data from 33 host countries drawn from the period 1986-1996. The data were obtained from the Global Competitiveness Report (GCR), as a proxy of market labour flexibility. Görg used a dynamic model of determinants of FDI through the generalised method of moments (GMM) estimation technique. Görg finds that the labour market regulation has an influence on decisions regarding the location of FDI stocks.

Brada et al. (2006) argue that foreign investors in the host country are exposed to political and government instability caused by factors such as domestic instability, or conflict with neighbouring countries. Therefore, the value of the assets invested and future profits generated by the foreign investment in the host country is reduced by the effects of the value of the host country's currency. Another consequence stems from the effects of domestic sales, when exports are impaired, or production disrupted, or the facility is damaged. They find a positive response to reduced tensions and instability shown by the FDI flows to the Balkan countries. However, the researchers also find that FDI inflows to transition economies was unaffected by conflicts and political instability.

Asiedu (2006) investigated whether political instability deterred FDI inflows to Africa, with emphasis on three factors of political instability: coups, assassinations and revolutions. Asiedu analysed uses data from the Cross-national Time Series Data Archive and finds that a strong policy environment, good institutions and political stability were highly significant in promoting FDI inflows to Africa. Asiedu's research findings are consistent with the findings of Fedderke and Romm (2006). The later researchers developed a model of location of the investment activity as an obvious choice in an inter-temporal context of locating new capital stock; that is, either domestically or in an alternative foreign location. This is to understand how current foreign investment decisions affect the choice of a location affect FDI has been made. Fedderke and Romm (2006) find that improved property rights as well as improved political stability, increased the attractiveness of South Africa as a destination for foreign investors.

The impact of change in the quality of government regulatory effectiveness and governance practices upon the direction of FDI flows were examined by Rammal

and Zurbruegg (2006) between five Asian economies (Indonesia, Malaysia, Philippines, Singapore and Thailand). They used a panel data set containing information on FDI flows from home to host countries and a standard panel model specification to conclude that there was a significant positive relationship between the quality and effectiveness of trade and investment government regulation existing within the host country and the amount of FDI received by the host country. This finding applied to four of five Asian economies namely: Indonesia, Philippines and Singapore. Indeed, it is only for Malaysia that neither home nor host regulation quality was significant in affecting FDI. This is partially due to the capital control restrictions imposed on the market in that country.

Dupasquier and Osakwe (2006) also conclude that political and macroeconomic instability, poor governance and ill-conceived promotion strategies are responsible for poor FDI inflows into African economies. They cite, in Ethiopia as example where promotion activities went hand-in-hand with the intensification of war with Eritrea. The researchers find that promoting good governance and improving the investment climate by using a regional surveillance mechanism based on peer pressure will lead to higher FDI inflows to African countries.

Demirbag et al. (2007) analysed the primary data from 145 affiliates of Western MNEs in Turkey via a survey. They find that political risk, financial incentives and culture distance did not significantly impact on the perceived performance of affiliates. Conversely, Busse and Hefeker (2007) investigated the role of political risk and institutions in host countries as determinants of FDI using data drawn from 83 developing countries over the period, covering 1984-2003. Busse and Hefeker applied the cross-country analysis approach to cover that 20 year period, and find that government stability, religious tensions and democratic accountability were positively associated with FDI.

Busse and Hefeker (2007) applied another approach, the Arellano-Bond GMM dynamic estimator to determine the effects of political risk and find that institutional indicators are significant to decision making. The researchers state that the second approach addresses both autocorrelation and endogeneity in time-series analyses. The findings related that, in particular, government stability, law

and order, bureaucratic quality and democratic accountability, are important determinants of foreign investment inflows.

Razin and Sadka (2007) studied the effects of corporate transparency on FDI by using panel data of 24 OECD countries during the period, from 1981-1998. They find that a lower level of host source accounting (indicating less transparency) in the host country augments the likelihood of attracting FDI flows from the source to the host country. Likewise, a lower level of host source creditor rights (less transparency) augments the amount of FDI inflows to the host country from the source.

Bénassy-Quér et al. (2007) analysed the effects of institutional variables such as existence and enforcement of labour laws, legal constraints on recruiting and terminating employment and regulation of labour market on FDI. The researchers used a database established by the French Ministry of Finance network in 52 foreign countries. Their findings indicated that bureaucracy and legal institutions are important determinants of inward FDI and that weak capital concentration and employment protection tended to reduce inward FDI.

Kolstad and Villanger (2008) point out that institutional quality and democracy appear more important for FDI in services than general investment risk or political stability. According to Cuervo-Cazurra (2008), corruption, arbitrary corruption and pervasive corruption have a negative influence on FDI. However, transition economies show high levels of corruption and also high levels of FDI. Kolstad and Villanger (2008) analysed the data of industry level FDI from 57 countries over a period of 1989-2000. They investigated the foreign economy determinants of FDI flows in services as a whole and in the major service industries. Their research finds that institutional quality and democracy appear more important for FDI in services, than general investment risk or political stability. Further, democracy is essential for FDI in developing economies and institutional quality matters in industrialised economies.

The above findings are consistent with those of Lskavyan and Spatareanu (2008) who used data from the commercial Amadeus to examine the effects of a host country's governance characteristics on the size of FDI. The researchers used

various property rights and corruption indices as proxies for the quality of governance in the host countries and population size as a proxy for market size. They find that poor government in host economies, such as (low institutional quality, property rights and corruption) had a significant restrictive effect on smaller foreign investors.

Kenisarin and Andrews-Speed (2008) also explored the extent of correlation between levels of FDI and three selected indicators relating to governance, economic freedom and corruption for each country in FSU. They find relationships between levels of FDI per capita to the year 2004 and three types of indicators relating, to governance, economic freedom and corruption perception. The researchers concluded that FDI, voice, and accountability governance have a negative relationship. These results support the outcomes of a study by Dutta and Roy (2009). Dutta and Roy established that greater media freedom meant higher FDI inflows to a host economy. Table 3.2 illustrates that the annual inward FDI flows into developed and developing countries against their voice of governance<sup>1</sup> from 2008 to 2010. Voice of government it indicates that Australia, Germany, United Kingdom and United States have a privileged legal system and rich record of freedom of expression, freedom association and a free media.

Seyoum (2009) examined the concept of transparency removal of describing as the all barriers to facilitate free and easy public access to corporate information and the laws, rules, social connivance and processes that facilitate and protect individuals and corporations that freely join, develop, and improve the process. He suggests that higher levels of corporate transparency lead to higher levels of inward FDI. Seyoum also examined the incremental role of corporate transparency after controlling for standard macroeconomic variables. In doing so, he finds that the level of corporate transparency significantly influences FDI inflows to developing countries. This implies that foreign investors are hesitant to invest in economies with low levels of transparency because it constricts their ability to accurately evaluate company performance. Further, the study shows that corporate transparency is positively, although weakly associated with the level of FDI inflows to developed economies.

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<sup>1</sup> Reflects perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

**Table 2.4: FDI among Developed and Developing Economies' Voice Governance from 2008 to 2010**

Country	Year	Percentile Rank	Annual FDI	Governance
China	2010	5.2	108.312	-1.65
	2009	5.2	95.000	-1.66
	2008	5.8	105.735	-1.66
Germany	2010	92.9	4.218	1.35
	2009	93.4	37.627	1.37
	2008	94.2	46.134	1.37
India	2010	59.2	42.546	0.42
	2009	59.2	35.649	0.44
	2008	59.6	24.640	0.47
Russia	2010	20.9	75.002	-0.94
	2009	20.9	36.500	-0.97
	2008	23.6	41.194	-0.9
United Kingdom	2010	91.9	176.006	1.31
	2009	91.9	156.186	1.32
	2008	92.3	196.390	1.32
United States	2010	87.2	104.809	1.16
	2009	86.3	237.136	1.13
	2008	85.1	215.952	1.08
Jordan	2010	26.07	1,650	-0.73
	2009	25.59	2,413	-0.82
	2008	27.88	2,826	-0.84
Australia	2010	94.79	34,357	1.43
	2009	93.84	27,938	1.40
	2008	94.71	45,430	1.39

Source: Kaufmann D., A. Kraay, and M. Mastruzzi (2010), The Worldwide Governance Indicators: Methodology and Analytical Issues. UNCTAD and own combination. Percentile Rank (0-100), Governance Score (-2.5 to +2.5).

On the Worldwide Governance Indicators (WGI), Australia has received the highest rank for voice and accountability governance, at 1.43 among developed and developing economies in 2010. However, Australia attracts around 34.357 billion FDI. Jordan has received reasonable rank of voice and accountability governance, at -0.73 and attracted 1,650 billion of inward FDI. In contrast, China is received to have a weak legal system and poor record of property rights protection; nonetheless, China pulled an attracted significant amount of FDI approximately U.S\$ 108.312 billion in 2010.

The above finding is consistent with Kyaw et al. (2011) who examined the impact of transparency on the value of multinational corporations. Kyaw et al. analysed all U.S MNCs data from 1998 to 2003, combining time series observation with cross-sectional observation for parameter estimation. They used the clustered standard errors approach and Monte Carlo simulation to avoid the problem of spurious regression analysis and significant regression results from unrelated data. The researchers find that a low level of transparency has a negative effect on the multinational corporations.

In a more recent study, Mengistu and Adhikary (2011) studied the effects of six components of good governance on FDI inflows to 15 Asian countries from 1996 to 2007. The researchers apply a fixed effect model for panel data with heteroskedasticity corrected standard errors. Mengistu and Adhikary (2011) suggest that four good governance components out of six are the key determinants of FDI inflows namely: political stability and absence of violence, government effectiveness, rule of law and control of corruption. Voice and accountability and regulatory quality appear to have no significant influence on FDI inflows to Asian economies. Table 2.5 shows the main determinants of inward FID by foreign country's political components.

**Table 2.5: A Summary of Previous Studies' Political Key Findings on the Determinants of FDI**

<b>Authors</b>	<b>Determinants of FDI</b>	<b>Methods</b>	<b>Effect (+, -)</b>
<b>Political risks:</b>			
Busse and Hefeker (2007)	Government stability, socio-economic conditions, investment, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability	Cross-sectional technique	Positive
Cazurra (2008)	Corruption, pervasive corruption, arbitrary corruption, GDP, inflation, distance, common border, common language,	Double-log model with quasi-fixed-effects	Positive
<b>Political risks: government stability</b>			
Brada et al. (2006)	Political instability, inflation, GDP, infrastructure reform, budget balance, current account, unemployment rate	Feasible GLS pooled-panel regression.	Positive
Fedderke and Romm (2006)	Political instability, political rights, property rights, average wage rate, trade openness, labour capital ratio, GDP, employment, capital stock, tax	VECM	Positive
<b>Political risks: government regulatory</b>			
Lskavyan and Spatareanu (2008)	Governance, corruption, property rights, exports, country population	Fixed effect logit model	Positive
Mengistu and Adhikary (2011)	Governance, political stability and absence of violence, government effectiveness, rule of law, corruption, trade, market size, human capital, interest rate, GDP	Feasible general least square (FGLS) and Prais-Winstein panel estimation methods	Positive
<b>Political risks: government accountability</b>			
Dutta and Roy (2009)	Legal environment, the economic environment and the political environment, GDP, exports, imports	OLS	Positive
Fereidouni et al. (2011)	Voice and accountability, GDP per capita, trade openness, schooling, resource abundance	Fixed-effects and dynamic	Positive

Therefore, the host economy that improves its governance environment in general is likely to attract more FDI regardless of the counterbalancing shortcomings of other dimensions of good governance such as voice, accountability and regulatory quality. Indeed, foreign investors do not invest in a country that has institutional loopholes, encourages corruption, and where bureaucracy increases the transaction cost of investment and the government can confiscate investments. Hence, a good governance infrastructure is of paramount importance to FDI inflows in a country.

## **2.4 Jordanian Studies**

Foreign investment (FDI and FII) is the most significant factor of economic growth, which encourages productivity of the national economy, augments the use of technology, reduces unemployment by creating new jobs and other encouraging outputs that differentiate this form of investment from other sources of capital. Consequently, most developing countries realised the need for capital flows in order to increase rates of economic growth. Despite the race among Arab economies to improve their business environment by updating their legislations to attract this form of investment and increase the competitiveness of their national economy, most of these countries are still suffering from a low volume of inward FDI compared to other economies. This is due to the absence of efficient legislations that should support the process of attracting inward FDI such as the imposition of higher taxes, the absence of political and economic stability in some countries, and the existence of administrative and financial corruption.

Like the rest of the world, foreign investment plays a vital economic role in Jordan and remains one of the main ways by which to enhance economic development. FDI inflows provide developing countries with the additional resources they need to improve their economic performance. The FDI inflows are expected to increase a country's output and productivity, to encourage local investment and to stimulate the development and dispersion of technology. Therefore, Jordan has done well in catching the attention of foreign investors as a consequence of numerous factors, such as internal and external political stability, supportive investment legislations, privatisation plans, advanced private sectors, and joining and merging with a variety of unilateral, bilateral and multilateral trade agreements. Moreover, foreign capital has been attracted by several factors such as the legal system, developed

infrastructure, availability of cheap and skilled labour, and the opportunity to undertake feasible projects (Investment Encouragement Corporation, Amman, Jordan).

While there have been numerous studies on the determinants of inward foreign investment (FDI and FII) inflows internationally, there are fewer, insubstantial studies on the relationship between FDI and FII in Jordan and Middle East countries. This section is divided into three subsections as follows: MENA region, ESCWA region and Jordanian literature of determining inward foreign investment (FDI and FII) in Jordan.

#### **2.4.1 Middle Eastern Studies and North Africa (MENA)**

Méon and Sekkat (2004) argue that poorly functioning institutions prevent MENA countries from participating to any great extent in the world economy. The researchers focus on the effects of institutions on manufactured exports and FDI attractiveness. According to Méon and Sekkat (2004), the MENA's record in terms of FDI attractiveness is disappointing. The region's share in global investment and private capital inflows is small and falling. The authors indicate that Tunisia is the most attractive economy with 2.15, followed by Jordan, whose FDI ratio amounts to 1.60 per cent. However, Algeria and Iran's FDI ratios, which hardly exceed 0.2 per cent, are the least attractive in the sample.

Reducing the degree of political risks in MENA would increase the ratio of FDI. In other words, it appears that the improvement and enhancement measured in relative terms would effectively attract FDI and increase its ratio. This is due to the greater estimated elasticity of FDI in terms of political risks. In this case, some MENA countries such as Tunisia and Egypt would be the main beneficiaries of any decrease in their level of political risks. Also, they would accordingly raise their FDI ratio by more than 1 percentage point if they mitigated their risk level to that of Switzerland. The FDI ratios of Morocco, Israel and Jordan would also increase, although to a lesser extent according to Méon and Sekkat (2004).

Awad (2006) suggests that Jordan and the Arab region should work on strengthening their financial market, improving the quality of government, and eliminating red tape and corruption in the region to create a suitable environment

for foreign investors. Also, this would have the effect of creating more transparency, introducing more liberal economic laws, cutting down bureaucratic procedure and providing better management. Additionally, the broadening and intensifying of the process of privatisation is a necessary step toward raising domestic productivity and attracting more FDI. Habash (2007) studied the dynamic relationship between the ratio of FDI to GDP and different types of risks in the MENA countries. The author used the vector autoregressive techniques (such as variance decomposition and impulse responses) on a national level for 11 MENA countries during the period 1980-2003. Habash (2007) obtained the time series data (FDI, inflation rate, corruption and political risk) from the World Development Indicators published by the World Bank and different kinds of risks from the International Country Risk Guide (ICRG).

Habash (2007) concluded that the political risks influence inward FDI in Jordan by 20.69 out of 28.78 based on the results of variance decomposition. The inflation rate in Jordan explains 5.99 out of 35.08 of the inward FDI in Jordan. According to the reported results of the variance decomposition test, corruption appears to have a 0.04 effect on inward FDI in Jordan out of 16.63. This indicates that the level of corruption is low as Jordan undertook political and economic reforms in 2000 in a move to liberalise trade to attract more foreign investment. Habash (2007) claims that the impromptu responses could not provide a clear indication of the dominant risks for Jordan and Iran, but there are some indicators or sub-components of political risks relatively play significant role in driving inward FDI. The author used corruption as a synonym for culture risk, since inward FDI in Jordan reacts effectively to shocks originating in corruption.

Moosa (2009) examined the determinants of FDI inflows in Middle Eastern and North African (MENA) countries. The author reported that FDI is attracted to countries that value education, research and development. The providers of FDI can in this case make use of the local labour force and technology, which may be cheaper than the alternative of importing them from the country of origin.

Sekkat (2012) explored the relationship between the evolution of the Mediterranean region's integration with the world economy and the reforms eventuating from the implementation of OLS. The author focuses on trade,

exchange rate, governance quality, availability of infrastructure and FDI. Sekkat (2012) estimated inward FDI four scenarios including the continuation of the current trends, further integration with the Europe Union (EU), less integration with (EU), but greater integration with the region and pessimistic.

For the first scenario, the author points out that the FDI ratio to GDP decreases slightly in all countries except for Jordan, where the decrease is relatively important. The second scenario suggests that there is an increase in the ration of FDI to GDP in all countries, but the highest increase is in Jordan with almost 2 percentage points compared to Egypt, Israel and Tunisia with 0.6 percentage points. This can be explained by the sensible improvements and enhancements achieved with respect to GDP per capita, openness, governance quality and infrastructure. In the third case, the increase in the ratio of FDI is still the highest for Jordan and economically significant around 0.9 percentage points, but remains non-negligible in Egypt, Israel and Tunisia at above 0.3 percentage points. Finally, the worst case scenario shows that a clear decrease occurs in all countries. The most affected economy is Jordan at around -4 percentage points followed by Egypt, Israel and Tunisia at around -1.5 percentage points. Therefore, greater openness of the economy, the availability of infrastructure and better quality institutions increase the attractiveness of countries with respect to FDI.

#### **2.4.2 Jordanian studies**

The Jordanian Government has taken important steps towards improving the business environment (macroeconomic and microeconomic) and pulling superior inflows of FDI, especially from the Arab world. The foreign investment determination has included the development of several investor-friendly economic zones and the privatisation of major national infrastructure and utilities companies (including transport, electricity, water and telecommunications). Meanwhile, Gulf-based investors have progressively invested in the property market in Jordan, mainly in the capital Amman and the burgeoning tourist area of Aqaba. The demand of non-resident Jordanians in the housing and real estate market has increased in domestic property in their home country. Therefore, net FDI inflows to Jordan increased to US\$ 3.25 billion in 2006, almost eight times the amount of FDI inflows in 2003. As a percentage of current GDP, FDI inflows stood at 22.8

per cent in 2006, the highest ratio among ESCWA countries (ESCWA Report 2008).

In most countries of the region, macroeconomic stability is considered an important factor in the recent flows of FDI, particularly in Jordan and Egypt. Spiralling inflation rates may shake the confidence of foreign investors. As insecurity increases, both domestic and foreign firms may be hesitant to invest in new plants and equipment. Also, export-oriented sectors are likely to experience a particularly strong reduction in investment activities, since higher costs for input factors will decrease competitiveness in global markets (ESCWA Report, 2008).

According to (ESCWA Report, 2009), the value of FDI inflows to Jordan increased very modestly to \$1.954 billion in 2008 from \$1.950 billion in 2007. This slight increase stemmed from the success of the government policy aimed at attracting FDI despite the current global financial crisis. This policy is based on three dimensions, namely: (a) privatisation of the main state-owned companies; (b) facilitating foreign-domestic partnerships; and (c) creating free trade zones. During the past decade, Jordan has improved its business and macroeconomic environments, thereby leading to substantial flows of investment from both domestic and foreign sources, which averaged some 27 per cent of GDP during the period 2000-2008.

Despite the increasing importance of FDI and FII in Jordan's economy, very few and limited studies have been carried out and not much is known about the extent and determinants of foreign investment. A review of several published studies (including conference papers) reveals that there are 5 Jordanian FDI studies for the period between 1996 and 2007. A summary of key findings on Jordanian determinants of foreign investment studies are shown in Table 2.6. Similar to the international trend on determinants of foreign investment behaviour (FDI and FII) research, studies of Jordan tend to focus on the effect of political conditions and their various components on FDI. Little attention has been paid to economic risk rate and financial conditions.

Al-Nuemat (2009) explored theoretically the obstacles facing trans-national corporations (TNC) considering the FDI in Jordan. The author applied Dunning's

theory, which indicates that the developing countries' ability to attract FDI is based on the host country's characteristics such as financial, economic and political risks or differences from home country, cultural differences and infrastructure. The author concludes that there are several barriers that reduce the level of inward flow of FDI to the Jordanian economy such as infrastructure barriers, taxation and legal framework, economic barriers and bureaucratic procedures.

Al-Nuemat (2009) points out that the Jordanian infrastructure falls short in the areas of transportation, power and water. For instance, in terms of power, Jordan's economy relies heavily on importing raw oil and petroleum, which is very costly. This would affect the FDI inflows. Also, the author indicates that there are few clear rules relating to stimulus regarding taxes and customs tariffs. Bureaucratic barriers in the public sector are considered a key challenge and prevent the government from attracting investors.

On other hand, according to Bakir and Alfawwaz (2009), Jordan successfully attracts FDI, as it enjoys stable macroeconomic and microeconomic environments characterized by internal and external political stability, incentives, and investment promotion law, privatisation schemes, and advancement of the private sector. Also, Jordan has work hard to liberalize trade by joining the World Trade Organisation (WTO), and engaging in various multilateral and unilateral trade agreements. In addition, foreign capital (FDI and FII) were strongly attracted by reliable legal system, the well-developed infrastructure and the availability of relatively cheap and skilled labour. Finally, a very important factor in attracting FDI was the availability of feasible projects on offer.

Bakir and Alfawwaz (2009) used a standard Gravity model to explore the influence of Greater Arab Free Trade Area Agreement (GAFTA) on the inflow of FDI between Arab countries and Jordan. The authors used a set of data for the period 1996-2007. Bakir and Alfawwaz (2009) argue that FDI depends on several variables such as GDP, per capita GDP, distance, integration agreements, common border countries and immigration (Jordanians working abroad). The authors suggest that economic size in terms of GDP and GDP per capita significantly influences FDI. The variables distance, common borders and Jordanians working abroad do not have a significant effect on inward FDI. Also, the economic

integration agreement (GAFTA) does not have a significant effect on FDI nor does it improve FDI flows to Jordan from Arab countries. In other words, it seems that FDI is mainly attracted by the availability of investment opportunities and bilateral agreements at the leadership level as well as open investment opportunities.

Khrawish and Siam (2010) studied the effects of the sub-components of economic risk rate and financial risk rate on FDI inflows to Jordan over the period 1997-2007. The authors obtain the Jordan country risks data from International Country Risk Guide (ICRG). The sub-components of economic risk rate used to estimate the behavior of FDI in Jordan are: GDP per head of population, real annual GDP growth, annual inflation rate, budget balance as a percentage of GDP, and current account balance as a percentage of GDP. Also, the authors used the sub-components of Jordan financial risk rate including: foreign debt as a percentage of GDP, foreign debt service as a percentage of export of goods and services (XGS), current account as a percentage of XGS, net liquidity as months of import coverage, and exchange rate stability.

Khrawish and Siam (2010) implemented a model developed by Chan and Gemayel (2004) in order to study the determinants of FDI flows to the economy of Jordan by using a Multiple Linear Regression Model. Khrawish and Siam (2010) conclude that there is a significant and positive relationship between FDI flows into the economy of Jordan and economic and financial variables. Table 2.6 shows the main determinants of Inward FDI, FII and MNE Activity.

**Table 2.6 Determining of Inward FDI, FII and MNE Activity**

Variable	Theoretically Predicted Effect	Effect on FDI, FII	Methods	Source
<b>Financial Risk</b>				
Foreign debt as a percentage of GDP	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Foreign debt service as a percentage of XGS	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Current account as a percentage of XGS	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Net liquidity as months of import coverage	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Exchange rate stability	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
<b>Economic Risk</b>				
GDP per head of population	Positive	Positive	Fixed Effects Model, OLS	Méon and Sekkat (2004); Khrawish and Siam (2010) Sekkat (2012)
Real annual GDP growth	Positive	Positive	Fixed Effects Model, Gravity model	Méon and Sekkat (2004); Bakir and Alfawwaz (2009) Khrawish and Siam (2010)
Annual inflation rate	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Budget balance as a percentage of GDP	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
Current account balance as a percentage of GDP	Positive	Positive	Multiple Linear Regression Model	Khrawish and Siam (2010)
<b>Political Risk</b>				
Corruption	Negative	Negative	Fixed Effects Model, VAR	Méon and Sekkat (2004); Habash (2007)
Institutions	Negative	Negative	Fixed Effects Model	Méon and Sekkat (2004)
Quality of governance	Positive	Positive	OLS	Sekkat (2012)

## 2.5 Australian Studies

Increased globalisation over the last two decades has led to strong growth of international business activity and foreign FDI and FII, which in turn has led to wide research on the causes and outcomes of foreign investment. According to OECD (Faeth, 2005a), Australia is the second largest net importer of FDI in the developed world. Despite the considerable number of studies that have been undertaken, Australia is a country with a significant share of foreign ownership whose foreign investment experience has been largely overlooked in terms of a comprehensive

economic analysis. Econometric work on foreign investment and its determinants and consequences is still limited. This situation exists despite the fact that Australia has an AAA international credit rating with a well-developed, deep and sophisticated financial market, regulated in accordance with international criteria. In terms of global turnover, Australia's foreign exchange market is the seventh largest in the world, and the Australian dollar/U.S. dollar is the fourth most traded currency pair globally (BIS, Triennial Central Bank Survey, 2010). As a consequence, the total stock of foreign investment in Australia stood at almost \$2 trillion as at December 2010. Portfolio investment made up 58% of total foreign investment in Australia, while direct investment contributed 24% (NSW Trade and Investment, 2011).

The first field study of Australian FDI was undertaken by Johns (1967) who surveyed extensively about a hundred American affiliated companies engaged in manufacturing in Australia in 1962. Johns (1967) finds that trade barriers have been particularly important factors inducing American firms to establish branches or subsidiaries in the Australia economy. Also, the author points out that tax minimisation appears to be a significant factor in determining the dividends and interest payments of U.S subsidiaries and affects the cost of imports and technical assistance provided by the mother company.

Buckley and Mathew (1979) investigated the motivation behind the investments of 52 UK companies and relate this to the characteristics of the individual firms in Australia for the period 1959-1972. The authors suggest that despite the physical distance, political stability, market opportunity, economic development and performance appear to be more formidable than distance for British investors.

Davidson (1980) reviewed the role of host country characteristics as determinants of FDI location patterns by using the data of foreign operations of 180 large U.S multinational corporations from their inception in 1975. Davidson (1980) concludes that U.S firms prefer to invest in a similar market such as Australia for several reasons the ready transferability of marketing, technology, human resources to similar countries and of lower levels of uncertainty facing the decision-maker in such an environment.

A small number of empirical studies have examined the behaviour of foreign investment in Australia (For example, Ratnayake, 1993; Tcha, 1999; Yang et al., 2000; Faeth, 2005b; Wijeweera & Mounter, 2007; Iyer et al., 2009 and Kirchner, 2012). Ratnayake (1993) used a simultaneous equation framework to analyse the factors influencing inter-industry variation of foreign ownership of manufacturing industry in the context of Australia. The author argues that export strength, import penetration, trade protection, concentration and profitability play a major role in determining foreign ownership in Australian industry. Ratnayake (1993) suggests that foreign ownership tends to be higher in human skill and technology intensive industries. Strong protection granted to import industries and a sound economy has a significant and positive effect on FDI.

Tcha (1999) studied the determinants of six major developed countries' (US, Japan, UK, New Zealand, Canada and Germany) inward FDI into Australia. Tcha argues that real exchange rates and foreign countries' current account balance the ratio of real GDP per capita, the ratio of real wages and the ratio of labour disputes between Australia and a relevant country influence foreign countries' FDI in Australia. The author used two econometric methods due to the lack of data: data-pooling analysis using annual data for 1980-1993 and a long-run elasticity analysis using quarterly data for 1985-1995.

Tcha (1999) concludes that inward FDI in Australia has been influenced by two variables: real exchange rate and foreign countries' current account balance. The real exchange rate has significantly negative effects on inward FDI in Australia. In other words, it explains that a unit appreciation of the Australian currency against the foreign currencies decreases inward FDI. Also, the author suggests that the foreign country's current account balance has a negative relationship with inward FDI. This indicates a marginal increase in foreign countries' FDI into Australia by the increase in their current account deficit.

Based on the long-run elasticity approach, results indicate that inward FDI into Australia appears to be decreased by Australia's labour disputes and the appreciation of the Australian currency. Inward DFI into Australia in the manufacturing sector is significantly affected by all kinds of labour dispute measures for Australia, while that in the mining sector is responsive to the whole industry's (including

manufacturing and transport sectors) working days lost rather than the mining sector's working days lost (Tcha, 1999).

Yang et al. (2000) conducted an econometric analysis of the determinants of aggregate inward FDI in Australia during the period 1985 to 1995. Yang et al. (2000) point out that interest rate, wage changes, a measure of the openness of the economy and variable representing industrial disputes are important drivers of inward FDI in Australia. The estimated model efficiently explains this within sample variability, but this efficiency is greater at the beginning of the sample than at the end.

Based on the dynamic analysis, the interest rate appears to be positively related to inward FDI in Australia, which reflects the fact that a higher interest rate in the host country makes foreign investment more attractive. The degree of trade openness is negatively related to inward FDI inflow into Australia suggesting that FDI is a way of circumventing trade barriers. Also, the authors emphasize that a higher inflation rate would discourage FDI inflow. Domestic wage growth and the severity of industrial disputes appear to determine the inflows of FDI in Australian economy. Therefore, the Australian government should maintain a high interest rate and low inflation rate and could consider imposing trade barriers to stimulate the inflows of FDI into the Australian economy (Yang et al., 2000).

Faeth (2005b) examined the determinants of inward FDI in Australia by employing the OLS method to analyse quarterly aggregate data from the third quarter of 1985 to the second quarter of 2002. The author argues that market growth, real wage growth, labour supply, openness and interest rates emerged as the key factors that explain the behaviour inflow of FDI in Australian economy.

The author points out that GDP appears to have the expected positive effect on FDI, meaning that a growth in market size makes Australia a more attractive place in which to invest. Another factor influencing the investment decision and encouraging FDI is the openness of the economy. However, the number of vacancies and the change in the real wage rate negatively affect the foreign investors' decision to invest in Australia, illustrating that a higher demand for labour makes production

more expensive, which makes Australia a less attractive place to invest (Faeth, 2005b).

Faeth (2005b) finds that exchange rate and inflation positively affect inward FDI in Australia. Inflation rate, which is determinant of locational advantage, implies macroeconomic stability and potential risk for foreign investors. Stability in inflation rate attracts more FDI, so a negative relationship is expected between inflation rate and FDI inflow. This could be explained by assuming that a strong Australian dollar reflects Australia's sound economic environment, making it a good place for investment. Also, there could be prospects of growth and higher net returns, as intermediate goods can be bought more cheaply in the international market place. The author infers that industrial disputes are not found to be significant in contrast to Yang et al. (2000). Nevertheless, the Australian interest rate has the expected positive sign, which is consistent with Yang et al. (2000).

According to Faeth (2005b), the factors that affect the investment decision initially are economic growth, openness, interest rates and job vacancies; however, contemporaneous wage rate changes and variations in the inflation rate have a short-term impact. Exchange rate appreciation increases FDI in the longer run but decreases it in the medium-run, while the corporate tax rate appears to have an unexpected positive effect in the longer run.

Wijeweera and Mounter (2007) applied VAR analysis techniques (impulse responses and variance decomposition) to investigate the long-term effects and simultaneous responses of the bilateral exchange rate, trade with the rest of the world, real gross domestic product and FDI into Australia to changes in the top company tax rate for the period 1960-2003. The authors suggest that the tax rate is an important determinant of FDI in Australia, as changes in the company tax rate also have important long-term effects on other key macro-economic variables.

Iyer et al. (2009) examined the interactive relationship among exports, imports, FDI and FII in Australian economy. The author used a robust Granger non-causality test and a co-integrated vector autoregressive (VAR) model to capture the relationships among the variables that are often non-stationary. According to Iyer et al. (2009)

inward FDI in Australia is not systematically related to trade as exports are weakly exogenous and related to FDI in a long-term relationship.

Kirchner (2012) constructed a model to determine inward FDI in Australia. The model estimates the effects of the liberalisation of foreign investment screening arrangement in the period following the Australia Free Trade Agreement with U.S (AUSFTA). The author used quarterly data for the period 1988-2005. Based on analysis using VAR techniques, Kirchner (2012) produced the following findings: trade weighted exchange rate and foreign interest rate appear to have negative effects on inward foreign investment (FDI and FII) in the Australian economy. However, GDP is found be positively correlated with FDI and FII. Kirchner (2012) concludes that inward FDI transactions are substitutes for FII. In other words, a 1 per cent increase in the growth rate of FII reduces inward FDI transactions by around 0.2 per cent.

In summary, the Australian empirical studies concentrating on ownership advantages are in line with theoretical prediction, but the testing of variables in studies concentrating on location factors (refer Table 2.7) such as market size, factor costs, transport costs and protection and risk factors (For example, Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer, 2009).

Even the most recent study had a number of weaknesses. For example, Kirchner's (2012) model covered only a short period (57observation 1989: Q3-2004: Q4) and did not consider a variety of theoretical and econometric techniques such as dynamic models (impulse response, variance decomposition and vector error correction model). Given these mixed results, more evidence is needed, particularly an analysis of more recent data, as the financial economic and political structure in Australia and internationally has been changing very rapidly. Table 2.7 shows the main determinants of Inward FDI, FII and MNE Activity.

**Table 2.7: Determinants of Inward FDI, FII and MNE Activity**

Study Source and Variable	Theoretically Predicted Effect	Effect on FDI, FII	Methods
<b>Ratnayake (1993)</b>			
High Protection Granted to Imports	Positive	Positive	Simultaneous Equation
Economic Sound	Positive	Positive	Simultaneous Equation
<b>Tcha (1999)</b>			
Exchange Rate	Negative	Negative	Data Pooling Analysis and Long-Run Elasticity
Foreign Countries' Current Account Balance	negative	Negative	Data Pooling Analysis and Long-Run Elasticity
Labour Disputes	Negative	Negative	Data Pooling Analysis and Long-Run Elasticity
<b>Yang et al. (2000)</b>			
Interest Rate	Positive	Positive	(OLS) Dynamic Regression
Trade Openness	*?	Negative	(OLS) Dynamic Regression
Inflation Rate	Negative	Negative	(OLS) Dynamic Regression
<b>Faeth (2005a, b)</b>			
GDP	Positive	Positive	(OLS) Regression
Openness Economy	*?	Positive	(OLS) Regression
Number of Vacancies	*?	Negative	(OLS) Regression
Change in Real Wage Rate	*?	Negative	(OLS) Regression
Exchange Rate	Negative	Positive	(OLS) Regression
Inflation Rate	Negative	Positive	(OLS) Regression
<b>Wijeweera and Mounter (2007)</b>			
Tax	Important	Important	VAR (Impulse Responses and Variance Decomposition)
<b>Kirchner (2012)</b>			
Trade Weighted Exchange Rate	Negative	Negative	VAR, Granger non-causality
Trade Openness	*?	Positive	VAR, Granger non-causality
Foreign Interest Rate	Negative	Negative	VAR, Granger non-causality

\*? : represents a non-identifying relationship.

## **2.6 The Determinants of Inward FII**

This section reviews the literatures of the host country's risks and the roles of financial, economic and political risks in determining inward FII. According to the International Country Risk Guide (ICRG) financial, economic and political risks have different components. Exchange rate, interest rate, external debt and current account are the host country's financial risk components. Economic risk rate have different factors such as real gross domestic product (GDP), growth, the annual inflation rate, and gross national product per head. Finally, political risks components are government stability, government quality, rules of law and adequate, protection of property rights, voice and accountability government, transparency and legislations.

### **2.6.1 Financial Determinants**

Typically, in finance, risk is synonymous with downside risk and is intimately related to the shortfall or the difference between the actual return and the expected return. This section describes the relationship between inward FII and the sub-components of a country's financial risk rate such as exchange rate, interest rate risk, external debt, current account. The interest rate risk refers to the possibility that an investment's value is changed due to a change in the absolute level of interest rates, in the spread between two rates, in the shape of the yield curve or in any other interest rate relationship. Such changes usually affect securities inversely and can be reduced by diversifying or hedging. The foreign investment theory suggests that interest rate differential host and sources economies may have a positive impact on inward FII. As, foreign investors can raise relatively cheap funds in the source country, they have greater competitiveness over rivals in the host country.

Chakraborty and Rawlins (2004) point out that short-term interest rates attracts new inward foreign investment in the form of FII in Latin America and East Asia. Baek (2006) explored the relative importance of "pull" and "push" factors in determining FII flows to Asian and Latin American economies. Baek (2006) finds a negative relationship between the US interest rate and indirect investment. Because the return in the US is low, inward FII to emerging countries grows as investors seek a

higher return. Nevertheless, Baek (2006) indicated a positive link between the performance of world stock and inward FII to these emerging markets.

It is quite natural for the current account to cause the inflows of FII to foreign economies, or the official settlements account. Once capital mobility is liberalized, the causal relationship can go one way or the other, or both might or might not cause the other depending upon the policy responses to the capital inflows. Yan Yan (2007) analysed the casual relationship in the current account and inward FII in the EMEs and developed countries. Yan (2007) reported that current account Granger causes the inward FII. This means that foreign investment gives rise to current account imbalance in the case of Brazil. However, regarding aggregated foreign investment, the U.K. shows no causal relationship between current account and inward FII.

Another financial determinant that influences inward FII is the foreign country's external debt. External debt (or foreign debt) is that portion of the total debt in a country that is owed to creditors outside the country. The debtors can be the government, corporations or private households. The debt includes money owed to private commercial banks, other governments, or international financial institutions such as the International Monetary Fund (IMF) and World Bank. Ciprian and Mihai (2008) studied the behaviour of inward FII in Romania and its external debt using an autoregressive model. Ciprian and Mihai (2008) report that the increase in Romanian external debt leads to more inward FII.

De Santis and Lührmann (2009) used a set of data covering a large number of countries from 1970 to 2003, in order to study the relationship between interest rate and inward FII location. De Santis and Lührmann (2009) conclude that a high money stock to GDP ratio implies lower interest rate in domestic stock, but it discourages investment in fixed income.

Exchange-rate risk is defined as the risk that changes according to the relative value of certain currencies, which will reduce the value of investments, denominated in a foreign currency. Several researchers have explored the relationship between a host country's exchange rate stability and inward FII. For example, Müller- Müller-Plantenberg (2010) explored the nature of the relationship

between inward FII and the exchange rate regime. The researcher (2010) used the Laplace transforms technique. Müller-Plantenberg (2010) reported that the country receives temporary inward FII inflows as the exchange rate-based stabilisation takes effect. Jongwanich (2010) investigated the nexus between inward FII and the exchange rate in emerging Asian countries. The researcher uses a dynamic data model for the period between 2000 and 2009. Jongwanich (2010) suggests that inward FII brings in a faster exchange rate appreciation than FDI. This is consistent with Rasciute and Pentecost's findings (2010), they find that the exchange rate is a potentially important determinant of FII as it affects the relative cost of production.

This is supported by the conclusion drawn by Uctum and Uctum (2011) who examine the effects of a macroeconomic determinant, which is the exchange rate, on inward FII in Turkey. The researchers (2011) point out that inward FII depends on the exchange rate. Moreover, Turkey's exchange rate has positive and significant effects on the level of inward FII inflows. Hence, a depreciation of Turkish currency helps to increase the level of FII inflows, because depreciation decreases the cost of production in terms of foreign investor's currency by more than the decrease in profit margins caused by the valuation effect.

Gwenhamo (2011) examined the link between external debt and inward FII in Zimbabwe for the period 1964-2005. Gwenhamo (2011) suggests that the ratio of external debt to GDP in Zimbabwe has significant and negative long-term coefficient effects on inward FII. This indicates that an increase in the government's external debt burden leads to an increase in the likelihood of balance of payments problems. In other words, this supports the notion that an increase in the government's external debt burden will result in uncertainty about future policy regarding foreign capital, which will discourage foreign investment. Indeed, a great government external debt burden may be an indication of weak or poor microeconomic policies.

Korinek (2011) explored the relationship between external currency debt and inward FII choice in open economy macroeconomics. Korinek (2011) infers that extension risk premium on emerging market and foreign currency debt increase macroeconomic volatility. Also, individuals base the currency composition of their

portfolio on a trade-off between the risks of foreign currency debt and the higher interest rates on local currency debts. Ersoy (2011) discussed the causal relationship between Turkey's current account and inward FII. The researcher used the Granger causality method to analyse quarterly data for the period 1987-2010. Ersoy (2011) suggests that current account deficits in Turkey.

### **2.6.2 Economic Determinants**

Economic determinants could be manifested in assessing a country's economic strengths and weaknesses, which include real GDP growth, real gross domestic product (GDP), the annual inflation rate, and gross national product per head. The previous studies consider that economic conditions are an important factor for foreign investors to make a decision about making investments in a host country. Durham (2003) explored the relationship between inward FII, FDI and economic growth. Durham (2003) applied simple OLS cross-sectional regressions to examine data on 88 countries from 1977 to 2000. Inward FII does not correlate positively with macroeconomic volatility. The regression also includes the interaction between FPI and stock market development, which is statistically insignificant and therefore indicates no threshold over which FPI is beneficial for expansion.

On one hand, Durham (2004) investigated the relationship between inward FII and economic growth. He used data from 8 countries from 1970 to 1998. Durham (2004) infers that lagged inward FII flows do not have a positive relationship with economic growth. Also, Durham (2004) investigated the relationship between inward FII flows and economic growth. Durham (2004) uses data on 80 countries from 1979 to 1998. Durham (2004) suggests that inward FII flows have a positive statistically significant relationship with GDP growth. This is consistent with Baek (2006), which indicate the relative importance of the GDP factor in determining inward FII flows to Asian and Latin American economies. Baek (2006) used quarterly cross-sectional and time series data from 1989 to 2002. Baek (2006) pointed out that GDP has a significant impact on inward FII inflows to Latin American and Asian economies.

Another element of a host country's economic risk rate is the GDP. Guerin (2006) examined the role of geography in the spatial allocation patterns of FDI, trade and

FII. As both FDI and FII have become important sources of foreign finance, their patterns of allocation can indicate whether geography matters for a host country in attracting financial flows. Guerin (2006) used a modified gravity model. Guerin (2006) suggests that inward FII flows are more sensitive to the macroeconomic fundamentals in the model such as GDP, GDP per capita, size and income of the host country than inward FDI. Also, Guerin (2006) points out that FII, compared to FDI, are highly sensitive to changes in GDP per capita. This implies that if there is a negative output shock, portfolio investment flows will be more volatile than FDI.

De Santis and Lührmann (2009) verified empirically whether the money to GDP ratio is associated with the net flows in equity securities and net flows in debt instruments. De Santis and Lührmann (2009) concluded that higher money to GDP ratio enhances international investment in domestic stock to the detriment of less attractive domestic bonds. This means that GDP is positively associated with inward FII inflows to the host country.

Many studies such as (Maela, 2009 and Poshakwale & Thapa, 2011) have indicated an interconnection between FII and the level of foreign economy's inflation. Maela (2009) explores how inflation hedging affects the ratio of the inward FII flows in different countries. Maela (2009) derived the stock returns from DataStream-Thomson and the inflation rate from the international financial statistics (IFS). Maela (2009) points out that inflation hedging is not significant in driving international indirect investment choice. However, Poshakwale and Thapa (2011) examine the influence of economic risk sub-components such as inflation risk on international equity portfolio investment. The researchers examined a bilateral portfolio holding data for 36 countries covering the period from 2001 to 2006. Poshakwale and Thapa (2011) demonstrated that the inflation risk is statistically significant in determining inward FII. Therefore, the level of a host country's inflation affects foreign investors' decision when choosing a location for inward FII.

Özkan-Günay (2011) study how differences in certain factors tied to economic and technological development levels affect FDI and FII among EU and candidate countries. This study used country-level data in the EU region. Özkan-Günay (2011) applied the following methods to panel data over the period from 1998 to 2008: fixed-effects models (FEM) outperform ordinary least squares (OLS) and

random effects models (REM). The researcher used the unemployment variable as an indicator of the business environment in the models. Özkan-Günay (2011) finds that macroeconomic stability is not so important to foreign investors in their decision to invest in developed members and emerging new member economies. This indicates that 15 EU countries have relatively more stable economies in terms of inflation and unemployment

Uctum and Uctum (2011) developed a model to examine the effect of international crises on capital flows by identifying endogenously the breakpoints created by these shocks (financial crises) in the data generating processes. Uctum and Uctum (2011) introduced several factors into the examination such as economic fundamentals of international investment flows, country-specific risk, reflecting political, financial and economic uncertainty as it is perceived by the foreign investors, and the impact of major crises and policy changes.

Uctum and Uctum (2011) opined that a rise in the risk reduces capital flows. Between 2000 and 2006, unit labour cost, the economic and financial risk rate are the leading factors driving inward FII. The positive sign for labour cost may recommend that the substitution effect dominates and that more expensive labour pushes firms to substitute foreign capital for labour. In another structural break between 2000 and 2005, the economic and financial risk rate has been gradually increasing simultaneously with the FII inflows, which replaced subdued FDI flows. This may have led to a simultaneous increase in inward FII and risk, which explains the positive sign of the economic and financial risk rate.

Lee and Min (2011) study the determinants of FII among Asia-Pacific region (APEC). Lee and Min (2012) gather data from the IMF's coordinated portfolio investment survey (CPIS), which geographically breaks down holdings of securities to equities and bonds. The CPIS collects information on the stock of cross-border holdings of equities and bonds, broken down by the economy of the residence of the issuer. Lee and Min (2011) exclude the holdings of securities, which comprise direct investment. Lee and Min (2011) consider long-term debt securities because the data for short-term debt securities are limited.

Lee and Min (2011) conclude that the coefficient on per capita GDP of source economies is positive and significant, suggesting that richer economies are major sources of FII. However, the coefficients on both population and per capita GDP of destination economies are significantly positive, suggesting that larger and richer economies are major recipients of the seven APEC economies' FII. The size of coefficient on per capita GDP is quite large, suggesting that a 10 percent increase either in per capita GDP of source economy or in that of destination economy will increase equity holdings by about 18 percent or 14 percent, respectively. Thus, it can be expected that cross-border inward FII flows will continue to increase as income grows, and it will increase at a rate higher than the income growth rate.

### **2.6.3 Political Determinants**

This section reviews the literatures dealing with the role of political risks in a host country in determining inward FII. Political risks can be seen as those risks stemming from socio-political factors such as the changes in government control, social fabric, or other non-economic aspects. These categories cover many different factors that vary from one rating agency to another. However, most rating providers such as the International Country Risk Guide (ICRG), Political Risk Services (PRS), Moody's and Standard and Poor's reflect on the following major components: government quality, rule of law and adequate, protection of property right, voice and accountability governance, transparency and legislations. Insurance exists for some political risks and can be obtained from a number of government agencies and international organisations<sup>2</sup>. A host country's political risks play a major role in determining inward FII. Therefore, developed and developing economies work hard to attract more inward FII.

Another reason for lower inward FII flows in developing countries is the existence of several formal and informal barriers, which deter foreign investors from investing. Foreign investors are more vulnerable to the risk of expropriation and hence their decision to invest is significantly influenced by the level of protection afforded to the investor. As a direct result, foreign investors are willing to invest further in economies, which have legal institutions that inspire confidence, have excellent accounting standards and good quality investor protection and

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<sup>2</sup>Based on information given in "www.prsgroup.com"

enforcement procedures (For example, Errunza, 2001; Stasavage, 2002; Bekaert & Harvey, 2003; Quan & Reuveny, 2003 and Hunter, 2005).

Stasavage (2002) suggests that a strong negative association exists between the absence of political 'checks and balances' and FII inflows to developing economies. However, Quan and Reuveny (2003) point out that inward FII and democracy are negatively associated. The second view of the relationship between voice and accountability governance and inward FII finds a positive association. Quan and Reuveny (2003) investigated the relationship between the globalisation and FDI inflows, FII inflows and the spread of democratic ideas. Quan and Reuveny (2003) indicate that FDI inflows are positively associated with democracy. In terms of either total foreign investment or indirect investment, the largest recipient, the United States, far surpasses China. For example, in 2001 the United States received a total of \$556 billion in foreign investment of which total \$426 billion or 77% was FII. In the same year, China attracted \$45 billion in foreign investment of which only \$1 billion or 2% was indirect investment (IMF, 2003).

The government uses a variety of ways to shape the economic life of a country. For example, the government could be allowing or suppressing opposition, helping or abusing the public through its agents, protecting or grabbing property right and enjoying transparency or liking ambiguous and corrupted. Good governance is an essential pre-condition to economic development with sustainability, equity and social justice through enhancing foreign direct and indirect investment inflows. According to the IMF's approach to promoting good governance and combating corruption, government quality or unity is a key factor in attracting foreign investment by ensuring the regulation of law, developing the efficiency and accountability of the public sector and tackling corruption as essential elements of economic prosperity (IMF, 2005).

The trust and confidence of the investors have an influence on foreign investment. Basically, this refers to the awareness of investors about government monetary and fiscal policies with the macroeconomic stabilities of a country (Acemoglu et al., 2005a). Indeed, foreign investors do not invest in a country that has institutional loopholes that encourage corruption, bureaucracy that increases the transaction cost of investment and a government that can confiscate investments. Hence, good

governance infrastructure is requirement strong prerequisite for FII inflows in a country.

Transparency is one of the sub-components of political risks. Transparency is the concept of removing all barriers to facilitate free and easy public access to corporate information and the laws, rules, social connivance and processes that facilitate and protect those individuals and corporations that freely join, develop, and improve the process. Gelos and Shang-Jin (2005) studied the effects of transparency (government and corporate transparency) on inward FII using a unique micro-data set on portfolio holdings of emerging market funds around the world for two sets of variables: a data set on investment positions by individual international funds across countries; and a set encompassing various measures of country transparency. Gelos Shang-Jin (2005) remark that foreign investors prefer to hold more assets on the inward FII where there are more transparent markets. There is some evidence that during a crisis, foreign investors tend to flee to more opaque locations. Indeed, the provision of more transparency could be an effective way for economies to attract and benefit from international financial integration while avoiding excessive volatility during turbulent times.

Goldstein and Razin (2006) developed a model to describe an information-based trade-off between inward FDI and FII. The researchers focus on corporate governance transparency (the transparency between managers and owners). Goldstein and Razin (2006) concluded that an increase in the level of transparency between owners and managers improves the efficiency of indirect investment and thus attracts more foreign investors to this type of investment. Therefore, developed countries that have greater corporate governance transparency tend to have more FII-type foreign investments than the FDI type.

Rule of law is another component of political risks; it pertains to the assessment of the strength and impartiality of the legal system and popular observance of the law respectively. These conditions encourage foreign investment and probably private domestic investment as well, by protecting privately held assets from arbitrary direct or indirect appropriation. In international business studies, there is a general notion that a country with a rule of law and adequate protection of property rights will attract more foreign investment. For instance, Li and Filer (2007) suggest that

a negative causal relation between the governance infrastructure and FII. The researchers emphasise that most countries ignore the difference between FII and FDI in terms of investors' protection. Direct investment gives investors more direct and effectual control and thus better protection, particularly in governance where laws are opaque, unproductive and accounting criteria are inadequate. Therefore, countries with poor governance (low level rule of law) attract relatively large amounts of FDI as opposed to FII.

However, this study has some limitations. There is an inconsistent coverage of the time periods during which the components of the governance environment are measured. For example, Li and Filer (2007) refer to the political rights measure corresponding to 1999, the rule of law variable corresponds to 2000 and the new component of freedom of the press, corresponds to 2001. In fact, the need for public versus private protection is quite different for FDI and FII. Another reason for lower inward FII inflows in developing countries is the existence of several formal and informal barriers, which deter foreign investors from investing. Foreign investors are more vulnerable to the risk of expropriation and hence their decision to invest is significantly influenced by the level of investor protection offered by the host country. As a direct result, foreign investors are willing to invest further in economies, which have greater confidence in the legal institutions, accounting standards and quality of investor protection and enforcement (Bekaert et al., 2007).

Another element of political risks is that of voice and accountability governance, which could be defined as the ability of people to participate in the selection of their government as well as freedom of expression, freedom of association and a free media<sup>3</sup> (Kaufmann 2009). Previous researchers have investigated the relationship between inward FII inflows and voice and accountability governance. For instance, Milner and Mukherjee (2009) suggest an ambiguous relationship between the inward FII and voice accountability governance. Milner and Mukherjee (2009) conducted several simple empirical exercises from reviewing the literature in order to evaluate the relationship between democracy and capital

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<sup>3</sup>Based on information given in Worldwide Governance Indicators (WGI, 2011), The Voice and Accountability Index is a measure of "various aspects of the political process, civil liberties and political rights, measuring the extent to which citizens of a country are able to participate in the selection of governments."

openness (FII) for 130 developing economies from 1975 to 2002. Milner and Mukherjee (2009) provided evidence that the level of democracy does not influence trade and capital openness.

Kim et al. (2010) explored the relationship between poor corporate governance and the inward FII as well as the impact of the quality of government in attracting foreign investment in Korea. Kim et al. (2010) provided some evidence that improvement in governance attracts more foreign investment. Table 3.8 shows that inward FII among Developed and Developing Economies' Voice Governance from 2008 to 2010. Germany, United Kingdom and United States have a well-established legal system and rich record of freedom of expression, freedom of association and a free media. Poshakwal and Thapa (2011) investigate the relationship between the quality of investor protection regulation and inward FII by using data for 36 developed and developing economies. The Poshakwal and Thapa (2011) findings are consistent with those reported earlier, where foreign investors become more concerned with investor protection measures that directly affect their investment interests.

**Table 2.8: FII among Developed and Developing Economies' Voice Governance from 2008 to 2010**

Country	Year	Percentile Rank	Annual FII	Governance
China	2010	5.2	31,357	-1.65
	2009	5.2	28,160	-1.66
	2008	5.8	8,721	-1.66
Germany	2010	92.9	1,991	1.35
	2009	93.4	11,985	1.37
	2008	94.2	65,475	1.37
India	2010	59.2	39,971	0.42
	2009	59.2	21,111	0.44
	2008	59.6	15,030	0.47
Russia	2010	20.9	4,808/	-0.94
	2009	20.9	3,369	-0.97
	2008	23.6	15,005	-0.9
United Kingdom	2010	91.9	11,487	1.31
	2009	91.9	78,844	1.32
	2008	92.3	70,908	1.32
United States	2010	87.2	172,376	1.16
	2009	86.3	220,972	1.13
	2008	85.1	126,805	1.08
Jordan	2010	26.07	2,042	-0.73
	2009	25.59	2,957	-0.82
	2008	27.88	5,211	-0.84
Australia	2010	94.79	11,101	1.43
	2009	93.84	33,29	1.40
	2008	94.71	19,413	1.39

Source: Kaufmann D., A. Kraay, and M. Mastruzzi (2010), The World Bank, The Worldwide Governance Indicators: Methodology and Analytical Issues. UNCTAD and own combination. Percentile Rank (0-100), Governance Score (-2.5 to +2.5)

On the Worldwide Governance Indicators (WGI), Australia has the highest rank of voice and accountability governance of 1.43 among developed and developing economies in 2010. However, Australia attracts around 11,101 billion of FII. In contrast, China has a poor legal system and a poor record of property rights protection, but China pulled a massive amount of FII around 31,357 billion in 2010. Jordan has a reasonable amount of inward FII of 2,042 billion comparing to its governance ranking of -0.73 in 2010.

Generally, regulations are used to fine-tune the arrangements, which give effect to the intent and purpose of primary legislation. Foreign economy tends to regulate a high quality of foreign investment legislations to attract foreign investors' attention such as protection law, friendly business environment and so on. Mengistu and Adhikary (2011) point out that according to the theory of political economics; governments are the controllers, regulators, and adjudicators of business sectors. Government is also instrumental in creating legislation in order to regulate the economy, structure the competitive environment and establish a regulatory environment in which business is conducted.

In recent research, Poshakwale and Thapa (2011) applied a fixed-effect model and used a set of data for 36 economies with bilateral equity portfolio allocation from investors of 16 developed countries for a period of six years. They examined the relationship between the quality of investor protection and inward FII. Poshakwale and Thapa (2011, 127) emphasize that regulations and investor protection reflected in the quality of institutions appear to be statistically significant in determining the inward FII. Indeed, the quality and implementation efficiency of legislations and regulations such as legal protection accorded to foreign investors should be adopted as an important policy to attract higher level of FII. A summary of past studies' key findings regarding the determinants of FDI are shown in Table 3.8.

**Table 2.9: A Summary of key Findings on the Determinants FII of Past Studies**

Authors	Determinants of FII	Methods	Effect (+, -)
<b>Financial Risks:</b>			
<b>Exchange Rate</b>			
Müller-Plantenberg (2010)	Exchange rate, balance payments, current account, real exchange rate, payment and reserve flows	Dynamic approach	Negative
Jongwanich (2010)	Real exchange rate, government spending, trade openness, terms of trade, productivity differences	Dynamic panel-data model	Negative
Uctum and Uctum (2011)	Exchange rate, interest rate, imports, exports, country risks	Sequential methodology and OLS	Negative
<b>Financial Risk</b>			
<b>Interest Rate</b>			
De Santis and Lüthmann (2009)	Interest rate, GDP growth, labour productivity, market capitalisation, current account, capital account, civil liberties	pooled OLS regression with time effects,	Negative
<b>Financial Risk</b>			
<b>External Debt</b>			
Ciprian and Mihai (2008)	Foreign debt, GDP	Autoregressive Models	Negative
Gwenhamo (2011)	the external debt to GDP ratio, capital intensity, political instability as well as the educational levels	Multivariate co-integration framework	Negative
Korinek (2011)	Foreign debt, exchange rate volatility, risk premium on local currency, macroeconomic volatility	Macroeconomic volatility	Negative
<b>Financial Risk</b>			
<b>Current Account</b>			
Yan (2007)	Current account, FDI, FII, GDP, financial account, exchange rate	Granger causality	Negative
Ersoy (2011)	Current account, financial account, debt and bank liabilities, GDP	Granger causality	Negative
<b>Economic Risk</b>			
<b>GDP growth</b>			
Durham (2003)	GDP growth, property right, corruption, stock market capitalization, regulation, schooling, bank credit to GDP, investment ratio	OLS cross-sectional regressions	Positive
Baek (2006)	Growth GDP, current account balance, inflation, real exchange rate	Cross-sectional regression models.	Positive
Guerin (2006)	GDP per capita, trade, population, distance between country	Cross country OLS	Positive
Uctum and Uctum (2011)	GDP growth, Exchange rate, interest rate, imports, exports, country risks	Sequential methodology and OLS	Positive
Lee et al. (2011)	Real GDP, exports, imports, openness, exchange rate, wage, tax	unobserved effects panel model	Positive
<b>Economic Risk</b>			
<b>Inflation Rate</b>			
Maela (2009)	Inflation rate, GDP, exports, imports openness,	OLS	Negative
Thapa and Poshakwale (2012)	GDP, market size, transaction cost, market liquidity, local equity market volatility, exchange rate volatility	OLS	Negative
Özkan-Günay (2011)	Inflation rate, unemployment, GDP, county risk, business environment, macroeconomic environment, gas prices, electricity prices, price of telecommunication	panel data models, OLS	Negative
<b>Political Risks</b>			
<b>Government Stability</b>			
Li and Filer (2007)	Political rights, market capitalization, rule of law, press freedom, trust, GDP, exchange rate,	OLS	Positive
Mengistu and Adhikary (2011)	Good governance, political stability and absence of violence, government effectiveness, rule of law, and control of corruption, trade, market size, human capital, interest rate, GDP	Feasible general least square (FGLS) and Prais-Winstein panel estimation methods	Positive

## 2.7 Research Issues

The review of past studies and theories suggests a number of research issues. The financial, economic and political determinants significantly influence inward FDI and FII and indicate mixed results for different developed and developing host economies. Internationally, several studies have concentrated on the individual impact of a country's determinants on inward FDI and FII such as Brada et al. (2006), Kenisarin and Andrews-Speed (2008), Khrawish and Siam (2010) and Cuyvers et al. (2011). On the other hand, previous studies Jordanian have concentrated on inward FDI, the sub-components of political risks and trade openness, for example, (Méon & Sekkat, 2004; Habash, 2007; Khrawish & Siam, 2010 and Sekkat, 2012). Australian empirical studies have focused on the advantages of inward FDI ownership in line with theoretical prediction and the testing of variables in studies that have focused on location factors, for example, (Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer, 2009). Other studies concerned with determining inward FDI used quarterly and annual data covering short periods. This study differs from the other Jordanian and Australian studies in terms of the period of time for which data was collected, the determinant variables of inward FDI and FII, and the data analysis techniques.

The current study is focused on the determinants of inward FDI and FII during the period 1996 -2010 using monthly data. Also, this study analyses whether or not the basic relationships differ for the three structure break periods using unlagged models in the preliminary analysis stage. This study considers all the determinant factors in Jordan and Australia including: financial, economic and political determinants. The degree of liberalization or trade openness is considered by using exports and imports as a percentage of GDP and stock market price. Also, the macroeconomic environment is considered by controlling for interest rate and inflation.

With regard to the host country determinants, factors such as financial, economic and political risks ratings are treated as indicators of financial and economic health, and political stability. This because financial, economic and political risk ratings relate to a country's financial position (foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a

percentage of exports of goods and services and net international liquidity as months of import cover and exchange rate ), its economic position (economic determinant and economic health including GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP) and its political position (government stability, socio-economic, investment profile, internal conflict, external conflict, corruption, military in politics, law and order, ethnic tensions, democratic accountability and bureaucracy) as subjective assessment by risk experts on the willingness of a country to meet its external obligations.

Therefore, this study addresses the following issues: Firstly, whether or not financial, economic and political risk ratings are acceptable as proxies for financial and economic health and political stability; secondly, whether or not the trade openness and stock market price determinants significantly influence the flows of inward FDI and FII to Jordan and Australia; thirdly, whether or not inflation and interest rate determinants significantly influence the flows of inward FDI and FII to Jordan and Australia; and finally, whether or not the influence of financial, economic and political risks, trade openness, inflation and interest rate variables differ between Jordan and Australia over the full period.

A number of researchers have studied the dynamic determinants of inward FDI and FII. A few of them have considered the dynamic relationship between all country risk determinants, stock market price and inward FII. Despite the fact that past studies have examined the dynamic movements between foreign investment and part of country risk determinants, trade openness and macroeconomic environment, there is no evidence of showing the long-term relationship, short-term relationship and exogeneity between the variables. Past studies used the VAR model and granger causality to determine the long-term relationship and the direction, for example, (Wijeweera & Mounter, 2007; Yaoxing, 2010; Siddiqui & Ahmad, 2011 and Pradhan & Saha, 2011). A limited number of studies such as Uctm and Uctm (2011) have considered the structure breaks in the data.

This study differs from other Jordanian and Australian studies. The Jordanian studies focus on the market seeking advantage, but the testing of variables in studies focuses on the framework policy factors such as corruption, institutions, quality of

governance infrastructure, exports, openness, for example, (Méon & Sekkat, 2004; Habash, 2007; Bakir & Alfawwaz, 2009; Khrawish & Siam, 2010 and Sekkat, 2012). For instance, these models were based on a short time period (1997-2007) and did not consider a variety of theoretical and econometric techniques such as dynamic models (impulse response, variance decomposition and vector error correction model). Given these mixed results, more evidence is needed, particularly from an analysis of recent data, as the financial economic and political structure in Jordan and internationally has been changing very rapidly, particularly since the onset of the Global Financial Crisis (GFC).

Previous Australian studies concentrating on ownership advantages are in line with theoretical prediction, but the testing of variables in these studies concentrated on location factors such as market size, factor costs, transport costs and protection and risk factors, for example, (Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer, 2009). Even the most recent studies had a number of weaknesses. For example, Kirchner's (2012) model was based on a short time period (57 observations 1989: third quarter-2004: fourth quarter) and did not consider a variety of theoretical and econometric techniques such as dynamic models and analysis of exogeneity. Similarly, more evidence is needed to analyse more recent data and take structural breaks into account.

Therefore, this study differs from other studies as it tests for dynamic long-term balanced relationships and short-term relationships. This study uses Johansen and Juselius cointegration and a VECM to capture the long-term relationship between country risks, trade openness, and macroeconomic factors. Also used is the, Granger causality Block Exogeneity Wald tests, impulse responses function, and variance decomposition to capture the short-term dynamic relationships.

## **2.8 Conclusion**

This chapter briefly reviews important theories pertaining to foreign investments (FDI and FII) such as International Trade theory and Dunning's Eclectic Paradigm (Dunning & Lundan, 2008). The chapter begins with an overview of the theoretical structure of FDI and FII followed by a history of FDI and FII theories and a review of the literature on general theories of FDI and FII. Several international studies on the determinants of foreign investment and their impact on the host country are also discussed with a critique of the role of government. Also, this chapter reviews the determinants of foreign investment in Jordan and Australia. Foreign investment can be regarded as part of a firm's strategy in achieving its goals of increasing profit and serving the foreign market.

In the early stage of foreign investment, international trade theory was useful in explaining the movement of foreign investment and trade in a foreign country. International trade theory issues generally consist of three types of questions for economists. The first question is based on constructions of trade movements between at least two nations. The second question relates to the nature and extent of gains or losses to an economy. Finally, the third issue involves the influence of trade policies on an economy. Most theories of international trade are devoted to the first issue and attention will now turn to the theoretical reactions to such an issue in the form of: classical trade theory, factor proportion theory and product life cycle theory.

Dunning's (1980) Eclectic Paradigm was useful in explaining FDI characteristics and firms' specific advantages. Basically, this theory offers an analytical basis for nearly all studies pertaining to international production and FDI. It is based on the internalisation theory by including location-specific factors in various countries in order to help determine foreign investment (Dunning, 1980). The eclectic paradigm indicates that the extent, geography, and composition of FDI are determined by the interaction of three sets of interdependent variables: ownership, location, and internationalisation (OLI) advantages. The eclectic paradigm offers the analytical framework for accommodating a variety of operationally testable theories on FDI.

Many theoretical and empirical studies such as (Alfaro et al., 2004; Lim, 2008; Asiedu et al., 2009; Alfaro et al., 2010; and Karabay, 2010) suggest that various

factors that influence the location choices of multinational enterprises (MNEs) and foreign investors such as financial, economic, political conditions and trade openness.

This dissertation addresses four questions, which assist in determining inward FDI and FII. Firstly, are financial, economic and political risk ratings statistically usable as proxies for financial and economic health and political stability? Secondly, do the trade openness and stock market price determinants have a significant influence on the flows of inward FDI and FII to Jordan and Australia? Thirdly, are inflation and interest rate determinants a significant influence on the flows of inward FDI and FII to Jordan and Australia? Finally, are the influences of financial, economic and political risks, trade openness, inflation, and interest rate variables different for Jordan and Australia over the full period? The underlying purpose is to arrive at policy implications for foreign investment into Jordan. The next chapter discusses the construction of inward FDI and FII models in order to address the gaps in the theories and literature. Also, it discusses the formulation of hypotheses for determining inward FDI and FII.

## CHAPTER THREE

### HYPOTHESES AND MODELS

#### 3.1 Chapter Overview

Chapter Three presents a review of previous theories and literature on foreign investment and identifies the research issues. This Chapter presents hypotheses related to unlagged and lagged models in relation to theories and past research for the following determining inward foreign investment factors; country risks, openness trade and macro-economic factors. This is followed by a discussion of variables used to determine inward foreign investment. Section 3.4 specifies and describes the hypotheses of unlagged models for determining inward FDI and FII in Jordan and Australia, thereby addressing some gaps in extant literature and theories. Also, this section discusses briefly the related literature and theories of foreign investment, and host country's macroeconomic financial environment, which include trade openness, stock market price, inflation and interest rate.

#### 3.2 Hypotheses Formulation

Many theoretical and empirical studies (For example, Brada et al., 2006; Kenisarin & Andrews-Speed, 2008; Khrawish & Siam, 2010 and Cuyvers et al., 2011) suggest various factors that influence choice of location for foreign investment. Some factors (For example, Alfaro et al., 2004; Lim, 2008; Asiedu et al., 2009; Alfaro et al., 2010; and Karabay, 2010) pertain to companies and others (For example, Méon & Sekkat, 2004; Habash, 2007; Bakir & Alfawwaz, 2009; Khrawish & Siam, 2010 and Sekkat, 2012) apply to countries, which can be either a host country or home country. The characteristics of a host country's investment environment, such as financial and economic health, and political stability, are important for attracting foreign investment. In the next Chapter, the financial, economic and political factors a host country's risk ratings are described in detail.

The stability of the macro-economic environment is important for business and the competitiveness of a country; without it, the economy cannot grow and attract foreign investment in a sustainable manner. Therefore, macro-economic and financial stability have captured the attention of the policy makers who wish to create a suitable business environment for foreign investors. The following sub-

sections describe the research hypotheses construction of unlagged preliminary analysis and lagged main analysis models.

### **3.3 Hypotheses of Unlagged Models**

This sub-section describes the relationships and formulates hypotheses for both Jordan and Australia, inward FDI, FII, financial health, economic health, political stability, trade openness, stock market price, inflation rate and interest rate over the study periods. The full period is (1996-2010) and three structural breaks in the Jordanian times series data are as follows: From the Qualifying Industrials Zones (1996) to Free Trade Agreement (2001), from the Qualifying Industrials Zones (1996) to Global Financial Crisis (2008) and from the Free Trade Agreement (2001) to the Global Financial Crisis (2008). In the case of Australia, the three structural breaks as follows: From 1996 to Free Trade Agreement with U.S 2005, From 1996 to Global Financial Crisis 2008 and From Free Trade Agreement with U.S to the end of the study period 2010.

#### **3.3.1 Hypotheses of Financial Health**

This sub-section describes the relationship between FDI, FII and the sub-components of a country's financial health such as exchange rate, interest rate risk, external debt, and current account, in order to formulate hypothesis and relationship between inward FDI and FII in Jordan and Australia and their financial health.

Bevan and Estrin (2004) examined data to determine FDI inflows from Western countries, mainly in the European Union and in central Eastern Europe. They find that the host country risk proves not to be a significant determinant. On the other hand, Chakraborty and Rawlins (2004) pointed out that short-term interest rates attract new, inward foreign investment in the form of FII in Latin America and East Asia. Baek (2006) explored the relative importance of "pull" and "push" factors in determining FII flows to Asian and Latin American economies. Baek also finds a negative relationship between the US interest rate and indirect investment. Nevertheless, Baek presented a positive link between the performance of world stock and FII in these emerging markets.

Xing (2006) used a set of data covering Japanese direct investment in China's nine major manufacturing sectors from 1981 to 2002. This was in order to examine how

FDI inflows from Japan were affected by the real exchange rate between the Japanese Yen and Chinese Yuan. He suggests that the real exchange rate is one of the significant factors affecting Japanese FDI in China.

Further, Demirbag et al. (2007) find that financial incentives do not have a significant impact on perceived performance of the affiliate companies. However, Tomlin (2008) used the implications of the Model of investment under uncertainty to examine the relationship between exchange rates and FDI in 207 U.S industries. He contended that U.S dollar appreciations are positively correlated with service FDI flows into the U.S. Additionally, Alfaro et al. (2010) formalised a mechanism that emphasises the role of the local financial market in enabling FDI to promote growth through linkages. They concluded that there is an increase in the share of high level growth in financially developed economies by using realistic parameter values. Nevertheless, Arratibel et al. (2010) highlighted that a negative effect of exchange rate volatility on FDI stock and negative relation between exchange rate volatility and FDI, is even more negative for more open economies.

Korinek (2011) explored the relationship between external currency debt and foreign indirect (portfolio) investment choice in open economy macroeconomics. He finds that extension risk premiums on emerging markets and foreign currency debt increase macroeconomic volatility.

In the content of the above theory and related literature, the following hypotheses are as follows, in order to examine the behaviour of inward FDI and FII in Jordan and Australia financial environment over the full period three structural breaks:

**H<sub>1a</sub>: There is a relationship between financial health and FDI in Jordan over the study periods.**

**H<sub>1b</sub>: There is a relationship between financial health and FII in Jordan over the study periods.**

**H<sub>1c</sub>: There is a relationship between financial health and FDI in Australia over the study periods.**

**H<sub>1d</sub>: There is a relationship between financial health and FII in Australia over the study periods.**

### **3.3.2 Hypotheses of Economic Health**

Economic risk can be ascertained by assessing a country's economic strengths and weaknesses, which include real gross domestic product (GDP), growth, the annual inflation rate, and gross national product per head. Previous studies indicate that economic risk is an important variable for foreign investors to make a decision to invest in a host country.

Baek (2006) examined the relative importance of GDP factor in determining FII flows to Asian and Latin American economies, and finds that GDP has a significant impact on FII inflows to Latin American and Asian economies. Jinjark (2007) studied FDI and macro-economic risk for each US multi-national industry, by measuring vertical FDI share as a ratio of exports to a parent country relative to local sales by foreign affiliates. He finds that FDI activities of US multi-nationals in industries with a higher share of vertical FDI responded more disproportionately to negative effects of macro level demand, supply and sovereign risks.

Uctum and Uctum (2011) find a positive sign of economic health's effect on FII. This finding indicates that as economic risk increases, most investors revert to FDI and presumably withdraw from indirect investment. Thapa and Poshakwale (2012) examined data from 36 countries, both developed and developing, from 2001 to 2009 with approximately 4600 observations. Thapa and Poshakwale (2012) find a positive, significant relationship existed between foreign equity portfolio allocation and GDP growth.

According to Lim (2008), establishing an investment promotion agency is an effective way to attract FDI flows. Moreover, Kenisarin and Andrews-Speed (2008) established quantitative relationships between levels of FDI per capital for the year 2004, and three sets of indicators relating, respectively, to governance, economic freedom and corruption perception. Based on this, they emphasised that the level of FDI in the former Soviet Union States had been determined though planned economy moving towards a market economy. Azémar and Delios (2008) tested the influence of corporate taxes on FDI in developing countries. They find a significant negative correlation between FDI and corporate tax rates. Therefore, corporate tax

rates are considered as important determinant of inward FDI. Hence, above literature and theories leads to the following hypotheses:

**H<sub>2a</sub>: There is a relationship between economic health and FDI in Jordan over the study periods.**

**H<sub>2b</sub>: There is a relationship between economic health and FII in Jordan over the study periods.**

**H<sub>2c</sub>: There is a relationship between economic health and FDI in Australia over the study periods.**

**H<sub>2d</sub>: There is a relationship between economic health and FII in Australia over the study periods.**

### **3.3.3 Hypotheses of Political Health**

Political risk refers to the quality of the institutional business environment. A host country's political risk is the risk that returns to investment may suffer as a result of low institutional quality and political instability. There are many reasons to believe that sound institutional quality and low political risks should attract more FDI and FII.

Numerous studies have examined the determinants of foreign investment in a host country. Using different econometric techniques and periods, Harms and Ursprung (2002), Jansen and Stokman (2004) and Busse (2004) finds that MNEs are more likely to be attracted to a democracy. Nevertheless, Egger and Winner (2005) established a significant positive relationship between corruption and FDI, which suggests that corruption is a stimulus for FDI. Nonetheless, Demirbag et al. (2007) find that political risk, financial incentives and cultural distance do not have a significant impact on the perceived performance of affiliates.

On the other hand, according to Busse and Hefeker (2007), political risks have a significant impact on FDI inflows. Kolstad and Villanger (2008) also suggest that institutional quality and democracy appear more important for FDI in services, than general investment risk or political stability. However, Li and Filer (2007) emphasised that most countries ignore the difference between FDI and FII in terms of investors' protection. Li and Filer pointed out that a country with poor governance (inadequate laws) may attract a relatively large amount of FDI as opposed to FII.

According to Cuervo-Cazurra (2008), corruption, arbitrary corruption and pervasive corruption have a negative influence on FDI; whereas, transition economies show both high levels of corruption and high levels of FDI. Asiedu et al. (2009) state that the optimal levels of FDI decrease as the risk of expropriation rises.

Previous researchers investigated the relationship between FDI, FII inflows and government accountability. The findings are paradoxical: one group of researchers (For example, Harms & Ursprung, 2002; Quan & Reuveny, 2003; Busse, 2004; Dutta & Roy, 2009 and Morrissey & Udomkerdmongkol 2012) find a positive relationship between FDI, FII and the level of government accountability. A second group (For example, Stasavage, 2002 and Kenisarin & Andrews-Speed, 2008) found a negative association; and third group (For example, Milner & Mukherjee 2009 and Mengistu & Adhikary 2011) argued that the relationship is ambiguous.

Poshakwal and Thapa (2011) investigated the relationship between the quality of investor protection regulation and international equity portfolio investment by using data from 36 developed and developing economies. These researchers reported that foreign investors are more concerned with investor protection measures that directly affect their investment interests. Consequently, based on this overview of the related literature, the corollary hypotheses are formulated to investigate the contemporaneous relationship between inward FDI and FII in Jordan and Australia and their political stability components over the study periods as follows:

**H<sub>3a</sub>: There is a relationship between political stability and FDI in Jordan over the study periods.**

**H<sub>3b</sub>: There is a relationship between political stability and FII in Jordan over the study periods.**

**H<sub>3c</sub>: There is a relationship between political stability and FDI in Australia over the study periods.**

**H<sub>3d</sub>: There is a relationship between political stability and FII in Australia over the study periods.**

### 3.3.4 Hypotheses of Trade Openness

One of the important features of the trend toward globalisation in recent years has been increased importance of FDI and FII flows around the world. Different strands of theoretical and empirical studies have explored the relationship between FDI and FII in developed and developing economies. According to Pritchett (1996), the openness of trade is “an economy’s trade intensity”. In other words, geography, population, culture and trade policy are only some of the factors that determine trade volume of a given county and are usually measured by the percentage of trade share to GDP.

Several studies have shown that the role of trade openness cannot be ignored in the attraction of FDI and FII. For example, Asiedu (2002) concluded that trade openness (exports and imports as percentage of GDP) promotes FDI to both Sub-Saharan Africa (SSA) and Non-Sub-Saharan Africa (non-SSA) countries, but the marginal benefit from increased openness is less for SSA. This suggests that trade liberalisation will generate more FDI to non-SSA countries than to SSA countries. Further, Neumayer (2005) maintained that countries more open to trade have higher inflows of foreign investment.

The trade openness is further emphasised by Ang (2008) who studied the determinants of FDI for Malaysia to inform analytical and policy debates. The research finds that an increase in the level of financial development, infrastructure development and trade openness promotes FDI. This finding is consistent with the findings of Constant and Yue (2010), who find that a long-term relationship between the FDI, trade openness and the Granger causality Block erogeneity Wald test showed a unidirectional causal relationship running from FDI to trade openness.

Several studies have analysed the impact of trade openness on foreign investment inflows to a host country. Babatunde (2011) finds that trade openness encouraged the inflows of FDI in the sample and showed a significant positive relationship between trade openness and FDI. Tekin (2012) also finds Granger causality running from FDI to real exports in Benin, but real exports Granger cause inward FDI in Haiti. Indeed, trade openness and economic liberalisation are two of the

factors that appear to increase the attractiveness of foreign investment to a foreign economy. Therefore, after discussing the associated literature and theories, this leads to the following hypotheses of how the trade openness in Jordan and Australia influence positively the flows of inward FDI and FII in their economies.

**H<sub>4a</sub>: There is a relationship between trade openness and FDI in Jordan over the study periods.**

**H<sub>4b</sub>: There is a relationship between trade openness and FII in Jordan over the study periods.**

**H<sub>4c</sub>: There is a relationship between trade openness and FDI in Australia over the study periods.**

**H<sub>4d</sub>: There is a relationship between trade openness and FII in Australia over the study periods.**

### **3.3.5 Hypotheses of Stock Market Price**

The development of a domestic financial system can measure the ability of foreign firms to borrow in order to continue innovative activities in a host country. FDI activities are measured by the financial flow data and may be only part of the FDI to developing countries, as some investment is financed through debt and/or equity raised in financial markets in host countries (Borensztein et al., 1998). Hence, the availability and quality of domestic financial markets affect FDI and FII and their impact on the diffusion of technology in host country. This diffusion process is more effective when financial markets are better developed in the host country. As a result, this allows the subsidiary of a MNC to expand its investment once it has entered the country. Therefore, the FDI, FII and domestic financial institutions are complementary with respect to enhancing the process of technological diffusion; thereby enhancing the level of attractiveness of foreign investment inflows to the host country.

According to Huang and Xu (1999), the development of a financial system affects the allocation efficiency of financial resources for investment projects. Additionally, investment linked to promotion of existing, or implementation of new technologies is more risky than other investment projects. Financial institutions may help to diminish these risks and motivate domestic entrepreneurs to undertake the upgrading of existing technology, or implement new technologies

introduced by foreign firms. The more developed the domestic financial system, the better it will be able to reduce risks associated with investment in upgrading old and adopting new technologies and attract capital flows. Therefore, financial institutions positively affect the speed of technological innovation, thereby enhancing economic growth

Naceur et al. (2007) noted that, among other factors, the existence of an equity market is important because it provides investors with an exit mechanism. That is, it attracts foreign capital (FDI and FII) inflows; provides important information that improves the efficiency of the financial system; and it provides the valuation of companies. Further, Zakaria (2007) concluded that there is a bi-directional causality between inward FDI and development of the domestic stock market in developing countries. The significant reverse causality from the stock market development to inward FDI indicates that the existence of a better developed stock market is imperative for attracting capital flows (FDI and FII).

The above is consistent with Kholdy and Sohrabian's (2008) findings that suggest reverse causality indicates the causal link between FDI and financial development is bi-directional and the development of financial institutions in a country can attract more FDI. Ang (2009) also highlighted that a more developed financial system allows a host country to benefit from FDI. Choong et al. (2010) also concluded that attaining a threshold level of stock market development allows countries to benefit from capital inflows.

While Dutta and Roy (2011) emphasised that financial development leads to greater FDI inflows up to a certain level of financial development; thereafter, the relationship becomes negative. However, with higher political stability, the negative impact sets in at relatively higher levels of financial development. Thus, the co-existence of competent financial markets and political stability is absolutely essential to capture and utilize the benefits of FDI. Consequently, based on this overview of the related literature, the corollary hypotheses are formulated to investigate the effect of development level in Jordan (Amman Stock Exchange) and Australia (Australian Stock Exchange) on attracting inward FDI and FII.

**H<sub>5a</sub>: There is a relationship between stock market price and FDI in Jordan over the study periods.**

**H<sub>5b</sub>: There is a relationship between stock market price and FII in Jordan over the study periods.**

**H<sub>5c</sub>: There is a relationship between stock market price and FDI in Australia over the study periods.**

**H<sub>5d</sub>: There is a relationship between stock market price and FII in Australia over the study periods.**

### **3.3.6 Hypotheses of Inflation Rate**

An inflation rate means that the general level of prices for goods and services is rising and, subsequently, purchasing power is falling. The inflation rate is frequently used as an indicator of macro-economic instability reflecting the presence of internal economic tension, or the inability or unwillingness of government. Therefore, central banks attempt to stop severe inflation, along with severe deflation, in an attempt to minimise excessive price rises (Mankiw 2007).

Several studies have explored the relationship between FDI and the host country's inflation. For instance, Rammal and Zurbruegg (2006) examined the determinants of FDI for five Asian economies, namely: Indonesia, Malaysia, Philippines, Singapore and Thailand, by using information on FDI flows from home to host countries. They concluded that a negative relationship indicated that an increase in the inflation rate lessens FDI in that country. However, when Trevino et al. (2008) investigated the process of institutionalization and legitimization in countries in Latin America and its impact on organisational decision-making regarding inward FDI (FDI). They find that a control variable of inflation is insignificant and does not support the contacting that lower inflation leads to greater levels of FDI.

Many studies (for example, Maela 2009 and Poshakwale & Thapa 2011) indicated an inter-connection between FII and the level of a foreign economy's inflation. Maela (2009) examined how inflation hedging affects inward FII in different countries. The researcher concluded that inflation hedging is not a motive in driving international indirect investment choice. However, Poshakwale and Thapa (2001) considered the influence of economic risk sub-components, such as inflation risk on international equity portfolio investment through bilateral portfolios containing data

for 36 countries (from 2001 to 2006). They find that inflation risk was statistically significant in determining FII.

Therefore, the level of host country inflation affects foreign investors' decisions when choosing a location for foreign investment. Thus, the hypothesis of inflation rate is as follows:

**H<sub>6a</sub>: There is a relationship between inflation rate and FDI in Jordan over the study periods.**

**H<sub>6b</sub>: There is a relationship between inflation rate and FII in Jordan over the study periods.**

**H<sub>6c</sub>: There is a relationship between inflation rate and FDI in Australia over the study periods.**

**H<sub>6d</sub>: There is a relationship between inflation rate and FII in Australia over the study periods.**

### **3.3.7 Hypotheses of Interest Rate**

The interest rate risk is that an investment's value changes when there is a change in the absolute level of interest rates, in the spread between two rates, in the shape of the yield curve or in any other interest rate relationship. Such changes usually affect securities inversely and can be reduced by diversifying or hedging. The foreign investment (FDI and FII) theory suggests that interest rate differential host countries and sources economies may have a positive impact on inward FDI and FII. This is because foreign investors who raise relatively cheap funds in the source country have greater competitiveness over rivals in a host country.

Farrell et al. (2004) used annual data from manufacturing industries in 16 countries for the period, 1984-1995. This research sought to identify the determinants of Japanese foreign direct investment. They find that the interest rate is positively and significantly determined Japanese FDI. Chakraborty and Rawlins (2004) also find that short-term interest rates attract new inward foreign investment in the form of indirect (portfolio) investment in Latin America and East Asia.

Baek (2006) explored the relative importance of “pull” and “push” factors in determining indirect (portfolio) investment flows to Asian and Latin American economies. Baek finds a negative relationship between the US interest rate and

indirect investment. This is because the return in the US is low and indirect investment in emerging countries increases as investors seek a higher return. This research provided a positive link between the performance of world stock and indirect investment to these emerging markets. Cuyvers et al. (2011) studied the effects of interest rate on inward FDI in developing economies such as Cambodia and they find that a negative link exists between interest rate and the level of inward FDI in a host country.

Thus, based on the previous studies, Jordanian and Australian interest rate plays major roles in determining the flows of inward FDI and FII in their economies. The hypothesis regarding interest rate is as follows:

**H<sub>7a</sub>: There is a relationship between interest rate and FDI in Jordan over the study periods.**

**H<sub>7b</sub>: There is a relationship between interest rate and FII in Jordan over the study periods.**

**H<sub>7c</sub>: There is a relationship between interest rate and FDI in Australia over the study periods.**

**H<sub>7d</sub>: There is a relationship between interest rate and FII in Australia over the study periods.**

### **3.4. Hypotheses of Lagged Models**

The primary objective of this study is to identify the main determinants of inward FDI and FII inflows to Jordanian and Australian economies. This is achieved by exploring the relationships between country risk ratings (financial, economic and political risks), trade openness, stock market, inflation and interest rate in a dynamic model context. In doing so, the study seeks to extend the multivariate cointegration and causality analysis, and understand the possible causes of inward FDI and FII, which may affect foreign investors' decisions in short- and long-term relationships between inward foreign investment in Jordan and Australia and their determinants . Also, the unlagged models are applied to find support or, otherwise, for the primary findings of unlagged model. The hypotheses are constructed based on past research evidence and theoretical prediction of the determinants of foreign investment as follows:

Past research evidence suggests that financial and economic factors Granger cause inward FDI. For instance, Wijeweera and Mounter (2007) applied VAR analysis techniques ( that is, impulse responses and variance decomposition) to investigate long-term effects and simultaneous responses of the bilateral exchange rate, trade with the rest of the world, real gross domestic product and FDI into Australia, to changes in the top company tax rate over the period 1960-2003. Those researchers suggest that tax rate is an important determinant of FDI in Australia, as changes in the company tax rate also have important long-run effects on other key macro-economic variables.

Iyer et al. (2009) examined the interaction relationship among exports, imports, FDI and FII in the Australian economy. The researchers used a robust Granger non-causality test and a cointegrated vector autoregressive (VAR) model to capture the relationships among the variables that are often non-stationary. According to Iyer (2009) inward FDI in Australia is not systematically related to trade as exports are weakly exogenous and related to FDI in a long- term relationship.

This is consist with the findings of Constant and Yue (2010) who examined the long-term relationship between FDI and trade openness in the Côte d'Ivoire for the period 1980-2007. Constant and Yue (2010, 103) concluded that a long-term relationship between the FDI and trade openness and Granger causality Block erogeneity Wald test shows a unidirectional causal relationship ranging from FDI to trade openness.

Gwenhamo (2011) analysed the nexus between external debt and inward FDI in Zimbabwe for the period 1964-2005. Gwenhamo (2011) suggests that the ratio of external debt to GDP in Zimbabwe has a significant and negative long-run coefficient effects on inward FDI. This indicates that an increase in the government's external debt burden leads to increase in the likelihood of balance of payments problems. In respect of the lagged inward FDI and FII models the following hypotheses are developed over the full period of study.

**H<sub>8a</sub>: Cointegration relationships do not exist in the FDI model for Jordan and Australia.**

**H<sub>8b</sub>: Cointegration relationships do not exist in FII model for Jordan and Australia.**

It is quite natural for the current account to cause inflows of FII to foreign economies, or the official Settlements Account. Once capital mobility is liberalised, the causal relationship can go one way or the other, or both might or might not cause the other, depending upon the policy responses to the capital inflows. Yan (2007) analysed the casual relationship before the current account and inward FII in the emerging market economies (EMEs) and developed countries. Yan (2007) reported that current account Granger causes the inward FII. This means that the foreign investment gives rise to current account imbalance in the case of Brazil. However, in the case of aggregated foreign investment, the U.K. shows no causal relationship between current account and inward FII.

Kholdy and Sohrabian (2007) explored the Granger causality links between inward FDI, financial markets, corruption and political risks. These researchers used annual data from 1976 to 2003 drawn from a group of 22 developing countries. In doing so, they used the ratio of net inflow of investment to GDP to measure inward FDI and focused on liquid liability, bank credit and private sector credit to measure the financial development. Their findings indicated that in the case of reverse causality there is a causal link between FDI and financial development.

Ersoy (2011) examined the causal relationship between Turkey's current account and inward FII, employing causality method Granger to analyse quarterly data over the period, 1987-2010. Ersoy finds a Granger causality extending from inward FII to current account deficits in Turkey. In respect to dynamic relationships in the lagged FDI and FII models, the following hypotheses are developed over the full period of study.

**H<sub>9a</sub>: Causal relationships do not exist in the FDI model for Jordan and Australia.**

**H<sub>9b</sub>: Causal relationships do not exist in the FII model for Jordan and Australia.**

Pradhan and Saha (2011) studied the drivers of FDI in seven SAARC countries for the period, 1980-2010, employing a panel VAR model. Based on the estimated results of cointegration tests, these researchers concluded that there is cointegration between FDI and the current account balance. This indicates a long-term relationship between FDI and current account and causality according to the Granger

test. This is consistent with Siddiqui and Ahmad's findings (2012) where the use of econometric techniques and analysis of quarterly data from Pakistan for the period 1976-2005, shows a long-term relationship between FDI and the current account. Similar to Pradhan and Saha (2011), Siddiqui and Ahmad highlighted that FDI and current account are cointegrated, with a long-term balanced relationship. Indeed, inward foreign direct and indirect investment in a host economy has a negative relationship with its current account.

Tekin (2012) examined potential Granger causality among the real GDP, real exports and inward FDI, in least developed countries for the period, 1970-2009. Tekin finds Granger causality running from FDI to real exports in Benin, but real exports Granger cause inward FDI in Haiti. Indeed, trade openness and economic liberalisation are of the factors that increase the attractiveness of foreign direct and indirect investment to foreign economy.

**H<sub>10a</sub>: The flows of inward FDI in Jordan and Australia is not endogenous over full period.**

**H<sub>10b</sub>: The flows of inward FII in Jordan and Australia is not endogenous over full period.**

### **3.5. Summary of the Variables Used in Determining Foreign Investment**

The theories and research literature (Alfaro et al., 2004; Lim 2008; Asiedu et al., 2009; Alfaro et al., 2010 and Karabay, 2010) on determinants of FDI and FII inflows into host countries have generally focused on identifying the location specific factors and relevant government policies that influence FDI and FII. Further, they use models that do not have strong micro and macro-foundations and financial, economic and political determinants

Several studies (For example, Bevan & Estrin, 2004; Onyeiwu & Shrestha, 2004 and Tolentino, 2010) find a connection between inward FDI and financial factors in host countries. These studies highlight that interest rate is one of the significant factors affecting the inflows of FDI to a host country According to Xing (2006) ; Cuyvers et al (2011); Takagi and Shi (2011) and Lee and Min (2011) exchange rate is an important determinant of FDI in host countries. Further, Ciprian and Mihai (2008);

Azam and Lukman (2010) and Gwenhamo (2011) also use the host country's current account as a determinant of FDI.

Regarding economic factors, Lim (2008); Kenisarin and Andrews-Speed (2008) and Azémar and Delios (2008) used macroeconomic factors, such as labour cost, GDP, market size and exchange rate, to determine the behaviour of FDI inflows. In relation to political factors, government stability is considered as determinant factor of FDI by Brada et al. (2006) and Fedderke and Romm (2006). Government regulatory and accountability employ by several researchers Lskavyan and Spatareanu (2008); Dutta and Roy (2009); Fereidouni et al. (2011) and Mengistu and Adhikary (2011) to determine the movements of FDI in host countries.

Many studies find that a relationship exists between inward FII and financial factors in host countries. For example, Müller-Plantenberg (2010); Jongwanich (2010) and Uctum and Uctum (2011) find that the exchange rate affected the inflows of inward FII into host countries and external debt is used as determinant for inward FII by Ciprian and Mihai (2008); Gwenhamo (2011) and Korinek (2011). In relation to economic determinants used GDP was found to be a significant determinant for inward FII along with inflation, Durham (2003); Baek (2006) Guerin (2006) and De Santis and Lührmann (2009). Inflation is considered as one of the important economic determinants influencing the inflows of inward FII. In the case of political determinants, government stability is used as significant factor influencing inward FII by (Li & Filer, 2007 and Mengistu & Adhikary, 2011).

Many studies (For example, Hasen & Gianlulgi, 2007; Dutta & Roy, 2009; Maela, 2009; Lee et al., 2011; Fereidouni et al., 2011 and Uctum & Uctum, 2011) have also employed trade openness individually to determine the degree of a host country's liberalisation. Further research employed (For example, Onyeiwu & Shrestha, 2004; Bevan & Estrin, 2004; Brada et al., 2006; Trevino et al., 2008; Tolentino, 2010 and Asiedu & Lien, 2011) Inflation and interest rate individually to measure macroeconomic stability.

Table 3.1 presents a summary of the variables (discussed in Chapter Three) that are frequently used in the determinants of FDI and FII. The variables are used to explore the behaviour of inward FDI and examine the host economy for the period

2007-2008; these constitute mostly financial and economic factors such as interest rate, stock market price, and trade openness. However, research undertaken during 2009-2011 finds that the significant variables influencing foreign investors' decisions to invest abroad are financial, economic and political factors. Recent studies have reported that political risks, financial risk, inflation, trade openness and stock market price are significant factors with which to examine the host economy and the effect of its business environment on the movements of inward foreign investment.

**Table 3.1: The Variables Generally Employed for Determining FDI and FII.**

Variables	Financial factors	Economic factors	Political factors	Trade openness	Stock market	Inflation Rate	Interest Rate
Naceur et al. (2007)	✓ +	✓ +			✓ +		✓ -
Kholdy and Sohrabian (2007)	✓ +	✓ +			✓ +	✓ -	
Zakaria (2007)	✓ +				✓ +		✓ -
Lim (2008)		✓ +		✓ +			
Kenisarin & Andrews-Speed (2008)		✓ +	✓ +				
Trevino et al. (2008))	✓ +	✓ +	✓ +	✓ +		✓ -	
De Santis and Lührmann (2009)		✓ +					✓ -
Maela (2009)		✓ +		✓ +		✓ -	
Dutta and Roy (2009)			✓ +	✓ +	✓ +		✓ -
Ang (2009)	✓ +				✓ +		
Cuyvers et al. (2011)	✓ +	✓ +	✓ +	✓ +			
Takagi and Shi (2011)	✓ +	✓ +		✓ +			
Lee and Min (2011)	✓ +	✓ +	✓ +	✓ +			
Asiedu and Lien (2011)			✓ +	✓ +		✓ -	
Mengistu and Adhikary (2011)		✓ +	✓ +				✓ -
Fereidouni et al. (2011)		✓ +	✓ +	✓ +			

### 3.6 Empirical Models Specification

Following foreign investment theories such as Eclectic Paradigm of Dunning (19970) and product life cycle theory (Vernon, 1979) discussed in Chapter Three, further research models are constructed to narrow the gaps identified in the literature and ensuing theories. Factors pertaining to a country (financial, economic and political determinants), trade openness and stock market macroeconomic factors (such as inflation and interest rate) are used in the models. Therefore, the models are

developed to investigate the determinants of inward FDI and FII in Jordan and Australia are discussed below.

Information on financial, economic and political variables and institutions is obtained from the International Country Risk Guide (ICRG), provided by the Political Risk Services (PRS) Group. According to Howell (2011), since 1984, the PRS Group has provided information that covering 22 variables in three sub-categories: financial, economic and political. An individual index is provided for each of the sub-categories. The financial and economic categories have five components and political has 12 components.

Financial risk ratings reflect financial determinants and financial health including: foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate stability. The economic risk ratings are used as proxy for economic determinants and economic health including GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP. The political risk is used as proxy for the following variables: political determinant and political stability (including government stability), socio-economic, investment profile, internal conflict, external conflict, corruption, military in politics, law and order, ethnic tensions, democratic accountability and bureaucracy quality.

Trade openness is measured in terms of imports plus exports as a percentage of GDP (Constant & Yue, 2010 and Babatunde, 2011). Stock market price is used to measure a financial market's level of development and efficiency. Inflation and interest rate are used to measure the host country's macroeconomic stability. The following Chapter Four presents the methodology for this study and discusses the data in further detail.

### **3.6.1. Unlagged Models**

The research unlagged models are constructed after identifying the gaps in the literature and theories for preliminary analysis. Country risks, trade openness, stock market macroeconomic factors are employed in the models. Thus, the models are

developed to investigate the determinants of inward FDI and FII in Jordan and Australia as follows.

The country variables (finance health, economic health and political stability) are included in the models. Several studies investigated the effects of exchange rate by employing OLS regression and find a connection between inward foreign investment and financial risks in the host countries. Examples of such studies include Cuyvers et al. (2011), Takagi and Shi (2011), Uctum and Uctum (2011) and Lee and Min (2011). They suggest that exchange rate, GDP and political risk are significant factors affecting the inflows of FDI to host country.

Several economic factors, such as trade openness, inflation and interest rate, are introduced individually to the models to improve the empirical analyses. Many studies have considered trade openness individually to capture the degree of the host country's liberalisation such as Hasen and Gianlulgi (2007); Dutta and Roy (2009); Maela (2009); Lee et al. (2011) and Fereidouni et al. (2011). Several researchers have used inflation and interest rate individually to capture macroeconomic stability such as Onyeiwu and Shrestha (2004); Bevan and Estrin (2004); Brada et al (2006); Trevino et al (2008); Asiedu; Tolentino (2010) and Lien (2011). Therefore, the unlagged models are constructed to determine the flows of inward FDI and FII into Jordanian and Australian economies as follows:

$$\begin{aligned} \log d(FDI_t) = & \beta_0 + \beta_1 \log d(FR_t) + \beta_2 \log d(ER_t) + \beta_3 \log d(PR_t) + \beta_4 \log d(OP_t) \\ & + \beta_5 \log d(IS_t) + \beta_6 \log d(INF_t) + \beta_7 \log d(INT_t) \\ & + \varepsilon_t \end{aligned} \quad 3.1$$

$$\begin{aligned} \log d(FII_t) = & \beta_0 + \beta_1 \log d(FR_t) + \beta_2 \log d(ER_t) + \beta_3 \log d(PR_t) + \beta_4 \log d(OP_t) \\ & + \beta_5 \log d(IS_t) + \beta_6 \log d(INF_t) + \beta_7 \log d(INT_t) \\ & + \varepsilon_t \end{aligned} \quad 3.2$$

Where:

$\beta_0$ : Constant.

FDI: First difference of logarithms FDI- long-term investment, ownership more than 10%.

FII: First difference of logarithms FII- long-term investment, ownership less than 10%.

FR: First difference of logarithms financial risk ratings as a proxy for financial determinants and financial health. These include foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of exports of goods and services, net international liquidity as months of import cover and exchange rate.

ER: First difference of logarithms economic risk ratings as a proxy for economic determinants and economic health. These include economic determinants and economic health including GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP.

PR: First difference of logarithms political risk ratings as a proxy for political determinants and political stability. These include political determinants and political stability including government stability, socio-economic, investment profile, internal conflict, external conflict, corruption, military in politics, law and order, ethnic tensions, democratic accountability and bureaucracy.

OP: First difference of logarithms exports and imports as a percentage of GDP.

IS: First difference of logarithms stock market price, measuring the development and efficiency in financial market.

INF: First difference of logarithms inflation rate, measuring macroeconomic stability.

INT: First difference of logarithms interest rate, measuring macroeconomic stability.

$\varepsilon_t$  : Error term.

### 3.6.2 Lagged Models

The techniques of lagged models, such as vector autoregressive model (VAR), cointegration, vector error correction model (VECM), Granger causality, impulse response functions and variance decomposition are used by many researchers to determine inward foreign investment in host countries. For instance, Habash (2007) employs VAR techniques (such as variance decomposition and impulse responses) at the country level for 11 MENA countries over the period, 1980-2003. Habash obtained the time series data (FDI, inflation rate, corruption and political risk) from the World Development Indicators published by the World Bank and different kinds of risks from the International Country Risk Guide (ICRG). The researcher concluded that the political risks influenced inward FDI in Jordan by 20.69 out of 28.78, based on the results of variance decomposition.

Constant and Yue (2010) examined the long-term relationship between FDI and trade openness in the Côte d'Ivoire for the period 1980-2007. They concluded that a long-term relationship exists between the FDI and trade openness and Granger causality Block Exogeneity Wald test showed a unidirectional causal relationship between FDI and trade openness. Therefore, the lagged models are constructed to determine the dynamic flows of inward FDI and FII into Jordanian and Australian economies as follows:

$$\begin{aligned} (FDI_t) = & \beta_0 + \beta_1(FDI_{t-n}) + \beta_2(FR_{t-n}) + \beta_3(ER_{t-n}) + \beta_4(PR_{t-n}) + \beta_5(OP_{t-n}) \\ & + \beta_6(IS_{t-n}) + \beta_7(INF_{t-n}) + \beta_8(INT_{t-n}) \\ & + \varepsilon_{t-n} \end{aligned} \quad 3.3$$

$$\begin{aligned} (FII_t) = & \beta_0 + \beta_1(FII_{t-n}) + \beta_2(FR_{t-n}) + \beta_3(ER_{t-n}) + \beta_4(PR_{t-n}) + \beta_5(OP_{t-n}) \\ & + \beta_6(IS_{t-n}) + \beta_7(INF_{t-n}) + \beta_8(INT_{t-n}) \\ & + \varepsilon_{t-n} \end{aligned} \quad 3.4$$

Where:

$\beta_0$ : Constant.

FDI: FDI- long term investment, ownership more than 10%.

FDI: Lagged FDI- long-term investment, ownership more than 10%.

FII: FII- long- term investment, ownership less than 10%.

FII: Lagged FII- long-term investment, ownership less than 10%.

FR: Lagged financial risk ratings.

ER: Lagged economic risk ratings.

PR: Lagged political risk ratings.

OP: Lagged trade openness.

IS: Lagged stock market price.

INF: Lagged inflation rate.

INT: Lagged interest rate.

$\varepsilon_t$  : Error term.

### **3.7 Conclusion**

This chapter develops the hypotheses and constructs the models utilised in this study, based on the significant variables employed by past studies to determine the inward FDI and FII in a host country. The Chapter begins by constructing the hypotheses of unlagged and lagged models. The hypotheses of unlagged models are based on three periods of structural breaks to explore the contemporaneous relationships between financial and economic health and political stability, the degree of liberalisation (trade openness and stock market price), macro-economic factors (inflation and interest rate) and inward FDI and FII in Jordan and Australia. In the case of lagged models, splitting the sample into sub-periods will lead to losing some degree of freedom. As a result, the hypotheses of lagged models are developed based on a full period to determine the long-term balance, and short-term dynamic relationships between, the variables of interest.

Country determinant factors such as financial, economic and political factors have a positive effect on inward FDI and FII. Financial determinants have different components; for example, foreign debt as a percentage of GDP, foreign debt service as a percentage of exports of goods and services, current account as a percentage of

exports of goods and services, net international liquidity as months of import cover, and exchange rate. Economic determinants have components that include GDP per head, real GDP growth, annual inflation rate, budget balance as a percentage of GDP and current account as a percentage of GDP. Also, political determinants have different components such as political stability (including government stability), socio-economic, investment profile, internal conflict, external conflict, corruption, military in politics, law and order, ethnic tensions, democratic accountability and bureaucracy.

The effect of trade openness is ambiguous; but generally, trade openness influences FDI and FII positively. The stock market price reflects financial market development and the financial institution system. Also, the stock market price is expected to have a positive effect on inward FDI and FII. The macroeconomic variables including inflation and interest rate appear to have a negative relationship with FDI and FII. The next Chapter on methodology and data discusses the method of the study and the financial, economic and political factors in relation to a host country's risks.

## **CHAPTER FOUR**

### **METHODOLOGY**

#### **4.1 Chapter Overview**

Foreign investment is considered as one of the most important sources of investment in Jordan, and therefore, the Jordanian government encourages such investment. The main objectives of this study are to: investigate the actual state of inward FDI and FII in the Jordanian economy and its financial market; identify the major determinants of FDI and FII; identify the country's risk factors (those that have an effect on FDI and FII); investigate the relationship between trade openness and inward FDI and FII; analyse the macroeconomic factors influencing inward FDI and FII; and compare the determinants of inward FDI and FII in Jordan with those in Australia's developed economy in order to arrive at some implications for Jordan's policy.

There are four stages of methodology presented in the Chapter. The unlagged models are examined to test contemporaneous relationships in line with the literature and methodology, following three steps. The first component is the descriptive statistics used to obtain an overview of the behaviour of variables in the models and test for structural breaks. Secondly, the errors of unlagged relationships are tested for serial correlation and heteroskedasticity. Thirdly, unit root tests are applied to ascertain non-stationarity and stationarity of the level series variables, and first differenced series variables respectively, and stationarity in the errors of the first differenced relationships. Finally, dynamic models are examined, and related cointegration and exogeneity tests are applied to ascertain long-term equilibrium relationships and short-term exogeneity.

#### **4.2 Unlagged Model Methodology**

The first stage of this study is the testing for contemporaneous relationships between the endogenous variables (inward FDI and FII) and exogenous variables, including country risks (financial, economic and political risks), trade openness, stock market price and macro-economic factors (inflation and interest rate) in Jordan and Australia. Several steps are followed when applying unlagged model methods in order to obtain robust results; for example, normality, serial correlation and the

variance of the conditional distribution. This part describes the process of applying the unlagged model methodology.

#### 4.2.1 Linear Regression Model

Linear regression analysis includes many techniques for modelling and analysing economic and financial time series data, when the focus is on the relationship between an endogenous variable and more than one exogenous variable. Regression methods continue to be an area of active research. In recent decades, new methods have developed for varying regression. These include: robust regression, regression involving correlated responses, such as time series and growth curves, regression in which the endogenous or exogenous variables are curves; images, graphs, or other complex data objects; regression methods accommodating various types of missing data, and nonparametric regression; Bayesian methods for regression, in which the exogenous variables are measured with error; regression with more exogenous variables than observations and causal inference with regression.

In linear regression, the model specification is that the endogenous variable  $Y_i$  is a linear combination of the parameters. For instance, in simple linear regression for modelling  $n$  data points, there is one endogenous variable and two parameters,  $\beta_0$  and  $\beta_1$ . In the case of simple regression, the formula for the linear regression is:

$$Y_t = \beta_t + \beta_{it}X_{it} + \varepsilon_t, \quad i = 1, \dots, n. \quad 4.1$$

Where,  $Y_t$  is the endogenous variable,  $X_{it}$  is the exogenous variable and  $\varepsilon_t$  is the “noise” term reflecting other factors that influence the exogenous variable (random disturbance) and capture sources of unexplained error. The relationship between the error term and the exogenous variables, such as whether they are correlated or not, is a crucial step in formulating a linear regression model, as it will determine the method to use for estimation. The model regression coefficients are expressed by  $\beta_{0t}$  and  $\beta_{1t}$  and the number of observations are quantified by  $n$  (Chatterjee & Hadi, 2006). Multiple regressions follow the same idea as simple linear regressions, except that they have several endogenous variables predicting the endogenous variable as follows:

$$Y_t = \beta_{0t} + \beta_{1t}X_{1t} + \beta_{2t} + \beta_{3t}X_{3t} + \varepsilon_t \quad 4.2$$

The multiple regression models of the natural logarithm are as follows:

$$\begin{aligned} \log d(\text{FDI}) = & \beta_0 + \beta_1 \log d(\text{FR}) + \beta_2 \log d(\text{ER}) + \beta_3 \log d(\text{PR}) + \beta_4 \log d(\text{OP}) \\ & + \beta_5 \log d(\text{IS}) + \beta_6 \log d(\text{INF}) + \beta_7 \log d(\text{INT}) \\ & + \varepsilon \end{aligned} \tag{4.3}$$

$$\begin{aligned} \log d(\text{FII}) = & \beta_0 + \beta_1 \log d(\text{FR}) + \beta_2 \log d(\text{ER}) + \beta_3 \log d(\text{PR}) + \beta_4 \log d(\text{OP}) \\ & + \beta_5 \log d(\text{IS}) + \beta_6 \log d(\text{INF}) + \beta_7 \log d(\text{INT}) \\ & + \varepsilon \end{aligned} \tag{4.4}$$

where, FDI is inward foreign investment, FII is inward foreign indirect investment, FR is the financial health, ER is the economic health, PR is political stability, OP is the trade openness, IS represents stock market price, INF is inflation rate and INT is interest rate.

The interpretation of the parameters ( $\beta_0$  and  $\beta_1$ ) from the above model is basically the same as for the simple regression model. That is,  $\beta_0$  indicates the value of  $y_t$  when all values of the explanatory variables are zero. Each  $\beta_i$  parameter indicates the average change in  $Y$  that is associated with a unit change in  $X_t$ , whilst controlling for the other explanatory variables in the model. Model-fit can be assessed by comparing deviance measures of nested models.

Many methods have been suggested for obtaining estimates of parameters in a model. The method discussed here is called ‘ordinary least squares’ (OLS), in which parameter estimates are chosen to minimise a quantity referred to as the residual sum of squares (Dinardo et al., 1997). The standard regression model as estimated by OLS was developed from a number of different perspectives; econometricians are typically interested in estimating the causal relationship between the endogenous variables and exogenous variables in the model. Therefore, several critical assumptions are needed for OLS (Poole & O’Farrell, 1971; Winship & Radbill, 1994 and Osborne, 2002): These are

- Normality of the error distribution  $\varepsilon_i$
- Each value of  $X_i$  and  $Y$  is observed without measurement error.
- The relationship between  $Y$  and each of the exogenous variables  $X_{i0}$  are linear in the parameters of the specific functional form chosen.

- The values of error terms  $\varepsilon$  are serially independent.
- Each conditional distribution of  $\varepsilon_i$  has a mean of zero.
- The variance of the conditional distribution of  $\varepsilon_i$  is the same across the distributions.
- The exogenous variables,  $X_i$ , are not linearly dependent on each other.

The Jarque-Bera test is applied to test the first assumption of OLS, which indicates whether the specified variables are normally distributed. This test has a chi-square distribution, with two degrees of freedom skewness and for kurtosis in relation to the shape of the distribution. The skewness is a measure of the degree of asymmetry of a distribution.

The second assumption of OLS indicates that  $X_i$  must be observed without measurement error. However, the explication of  $\varepsilon_i$  has to contain the influence of unspecified exogenous variables and an essentially random element in the relationship, but the error appears in measuring  $Y$  (Poole & O'Farrell, 1971). The third assumption is the linearity of relationship between the endogenous and exogenous variables. Linear regression is the most widely-used of all statistical techniques as it is usually concerned with the relationship between variables under an assumption of normally distributed errors. Hence, four of the five remaining assumptions relate to the attributes of the disturbance of the error term, the first two of which relate specifically to the nature of the condition distribution of  $\varepsilon$ . In other words, both of the first and second assumptions are concerned with the conditional distribution of  $Y$ .

The fourth assumption is concerned with the relationship between the error and its lags ( $\varepsilon_1, \varepsilon_{t-1}$ ), which is uncorrelated or serially independent. This is the core assumption in regression; the OLS will be biased and inconsistent if the relationship fails to hold. There are several reasons for discounting this assumption: incorrect functional specification, exogenous variables, omitted  $X_i$ , measurement error in the  $X_i$  and bias of sample selection (For example, Winship & Radbill, 1994). According to Osborne (2002), the assumption of homoscedasticity means that the variance of the conditional distribution of  $X_i$  is constant for all such distributions. However, when the variance of error terms differs for different values of the exogenous

variables, then heteroskedasticity is indicated. A slight heteroskedasticity has little influence on significant tests results (Berry & Feldman, 1985 and Tabachnick, 1996); but if heteroskedasticity exists, this leads to a serious distortion of findings and weakens the analysis. Therefore, if these assumptions hold, this means that the OLS estimator for exogenous variables is unbiased, asymptotically normally distributed and efficient in terms of linear-unbiased estimators.

#### **4.2.2 Regression Diagnostics**

The model for determining inward foreign direct and indirect investment in Jordan and Australia is constructed to predict the relationship between the endogenous (response) and exogenous (predictor) variables. Generally, regression diagnostics (OLS) play a vital role in identifying and validating such a relationship. Therefore, in order to achieve robust OLS results, the following regression Diagnostic Tests are applied to confirm OLS assumptions that are held:

- Durbin-Watson test for serial correlation.
- Breusch-Godfrey serial correlation LM test.
- Heteroskedasticity White test.
- Ramsey regression equation specification error test (RESET).
- Structural break time series Chow test and Quandt-Andrews test (1988).
- Unit root test including Augment Dickey-Fuller and Phillips-Perron tests.

##### **4.2.2.1 Testing for Serial Correlation**

Economic and financial time series data have a natural order over time. Correlation between these error terms is to be expected, especially when the period between observations is relatively short, such as minutes, hours or days, rather than months or years. This type of correlation between errors indicates serial correlation. The classical linear regression assumption of  $corr(\varepsilon_t, \varepsilon_{t-1}) = 0$  is broken. This is known in econometrics as Serial Correlation or Autocorrelation. In other words,  $corr(\varepsilon_t, \varepsilon_{t-1}) \neq 0$  and there is a pattern across the error terms. The error terms are then not independently distributed across the observations and are not strictly random.

Serial correlation does not influence the unbiasedness or reliability of OLS estimators, but it does influence efficiency. The OLS (with positive serial correlation) estimates of standard errors will be smaller than the true errors. This will lead to an inflated probability of type I error. The regression line will fit the observed values more closely than the true regression line and it will be observed as an inflated  $R^2$ . In order to test for serial correlation, the Durbin-Watson<sup>4</sup> (DW) test and Breusch-Godfrey (BG) test were applied.

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<sup>4</sup> Asteriou (2006) indicates that the (DW) test is the most frequently used statistical test for the presence of serial correlation and is considered valid if the following assumptions are met: The regression model includes a constant, serial correlation is assumed to be of first order only and the equation does not include a lagged dependent variable as an explanatory variable.

If  $e_t$  is the residual associated with the observation at time  $t$ , then the test statistic is

$$d = \frac{\sum_{t=2}^T (e_t - e_{t-1})^2}{\sum_{t=1}^T e_t^2} \quad 4.5$$

where  $T$  is the number of observations. Since  $d$  is approximately equal to  $2(1 - r)$ , where  $r$  is the sample autocorrelation of the residuals,  $d=2$  indicates no auto-correlation. The value of  $d$  always lies between 0 and 4. If the DW statistic is substantially less than 2, there is evidence of positive serial correlation. As a rule of thumb, if DW is less than 1.0, this means small values of  $d$ . This indicates that successive error terms, on average, are close in value to one another, or are positively correlated. If  $d > 2$ , then successive error terms are different in value from one another (negatively correlated). In regressions, this can imply an underestimation of the level of statistical significance. Therefore, in order to test for positive serial correlation, the null and alternative hypotheses may be written as:

- $H_0: \rho = 0$  no autocorrelation.
- $H_a: \rho \neq 0$  positive or negative autocorrelation.

To test for positive autocorrelation at significance  $\alpha$ , the test statistic  $d$  is compared with lower and upper critical values ( $d_{L,\alpha}$  and  $d_{U,\alpha}$ ):

- If  $d < d_{L,\alpha}$ , there is statistical evidence that the error terms are positively auto-correlated.
- If  $d > d_{U,\alpha}$ , there is no statistical evidence that the error terms are positively auto-correlated.
- If  $d_{L,\alpha} < d < d_{U,\alpha}$ , the test is inconclusive.

Positive serial correlation is serial correlation in which a positive error for one observation increases the chances of a positive error for another observation.

To test for negative autocorrelation at significance  $\alpha$ , the test statistic  $(4 - d)$  is compared with the lower and upper critical values ( $d_{L,\alpha}$  and  $d_{U,\alpha}$ ):

- If  $(4 - d) < d_{L,\alpha}$ , there is statistical evidence that the error terms are negatively auto-correlated.
- If  $(4 - d) > d_{U,\alpha}$ , there is no statistical evidence that the error terms are negatively auto-correlated.
- If  $d_{L,\alpha} < (4 - d) < d_{U,\alpha}$ , the test is inconclusive.

Negative serial correlation implies that a positive error for one observation increases the chance of a negative error for another observation. Conversely, a negative error for one observation increases the chances of a positive error for another (Dickey & Fuller, 1979).

Another test applied for serial correlation is the Breusch-Godfrey (serial correlation LM) test. The Breusch–Godfrey (BG) test is used to assess the validity of some of the modelling assumptions inherent in applying regression-like models to observed data series. In particular, it tests for the presence of serial dependence that has not been included in a proposed model structure and which, if present, means that incorrect conclusions can be drawn from other tests, or sub-optimal estimates of model parameters are obtained if serial dependency is not taken into account.

The Breusch–Godfrey serial correlation LM test is a test for auto-correlation in the errors in a regression model. Godfrey (1978) highlighted that it makes use of the residuals from the model being considered in a regression analysis, and a test statistic is derived from these. The null hypothesis is that there is no serial correlation of any order up to  $p$ . The test is more general than the DW statistic, which is valid only for non-stochastic regressors and for testing the possibility of a first-order autoregressive model (e.g. AR(1)) for the regression errors. The BG test is also known as the Lagrange Multiplier test. Consider the following model (Asteriou, 2006):

$$r_t = X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \dots + \beta_k X_{kt} + \mu_t \quad 4.6$$

Where

$$\varepsilon_t = \rho_1 \varepsilon_{t-1} + \rho_2 \varepsilon_{t-2} + \dots + \rho_p \varepsilon_{t-p} + \mu_t \quad 4.7$$

The Breusch-Godfrey LM test combines these two equations:

$$r_t = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \dots + \beta_k X_{kt} + \rho_1 \mu_{t-1} + \rho_2 \mu_{t-2} + \dots + \rho_p \mu_{t-p} + \varepsilon_t \quad 4.8$$

Thus, the null hypothesis and alternative hypothesis are:

$H_0$ :  $\rho_1 = \rho_2 = \dots = \rho_p = 0$ , no autocorrelation.

$H_a$ : at least one of the  $\rho$ s is not zero (positive or negative autocorrelation).

In order to perform the Breusch–Godfrey test, first estimate (4.7) by OLS to obtain residuals, then run the regression model (4.8). If the LM statistic  $(n - p)R^2$  is greater than the  $X_p^2$  critical value for a given level of significance, then the null hypothesis of serial correlation should be rejected and concluded that serial correlation is present.

#### 4.2.2.2 Testing for Heteroskedasticity

The possible existence of heteroskedasticity is a major concern in the application of ordinary least squares (OLS) analysis, including the analysis of variance. The reason for such concern is that the presence of heteroskedasticity can invalidate statistical tests of significance that assume modelling errors are uncorrelated, normally distributed, and that their variances do not vary with the effects being modelled. Therefore, the White test is applied to detect whether the errors are heteroskedastic or homoscedastic.

The white test asymptotic test does not require the research to specify the variables thought to determine the heteroskedasticity. It is based on an auxiliary regression with squared residuals as dependent variable and regressors given by: the regressors of the initial model (Johnston, 1997). Clearly, the White test is intended to test for forms of heteroskedasticity:

- The relation of  $\varepsilon^2$  with all independent variables  $X_i$ .
- The squares of the independent variables  $X_i^2$ .
- All the cross products  $X_i X_j$  for  $i \neq j$ .

The linear regression model (equation number 4.2) is estimated in order to test  $var(\mu_t) = \sigma^2$ , by obtaining the residuals,  $\hat{\varepsilon}_t$ . Thus, the set of non-redundant variables comprising regressors, squares and cross products are as follows (Brooks 2008 134):

$$\hat{\mu}_t = \alpha_1 + \alpha_2 x_{2t} + \alpha_3 x_{3t} + \alpha_4 x_{2t}^2 + \alpha_5 x_{3t}^2 + \alpha_6 x_{2t} x_{3t} + v_t \quad 4.10$$

where  $v_t$  is normally the distributed disturbance term independent of  $\mu_t$ . This regression is of the squared residual on a constant, the original exogenous variables, the squares of the exogenous variables and their cross products. This set already contains a constant; therefore, the auxiliary regression is  $\mu_t^2$  for these six regressors.

The White test uses the null hypothesis:

- $H_0$ : The variance of the disturbance term is homoscedastic  $var(\mu_i) = var(Y_i) = \sigma^2$ .

- $H_1$ : The variance of the disturbance term is heteroskedastic of an unknown form.

The White test is implemented to detect whether the model has heteroskedasticity or homoskedasticity. Since the White test results rejected the null hypothesis, this means that the model has heteroskedasticity. Therefore, the model is respecified using the autoregressive conditional heteroskedasticity (ARCH) modelling technique.

Autoregressive Conditional Heteroskedasticity (ARCH) was introduced by Engle and Granger (1982) and is specifically designed to model and forecast conditional variances. The variance of the dependent variable is modelled as a function of past values of the dependent, independent, or exogenous variables. In particular, the ARCH models assume the variance of the current error term to be a function of the actual sizes of the previous time periods' error terms: that is, often the variance is related to the squares of the previous error term (Brooks, 2008).

The conditional and unconditional variance of a random variable is exactly the same as that of the conditional and unconditional mean. Therefore, the conditional variance of  $\varepsilon_t$  may be denoted  $\sigma_t^2$ , which is formulated as (Bollerslev et al. 1992):

$$\sigma_t^2 = \text{var}(\mu_t | \mu_{t-1}, \mu_{t-2}, \dots) = E[\mu_t - E(\mu_t)]^2 | \mu_{t-1}, \mu_{t-2}, \dots] \quad 4.11$$

It is usually assumed that  $E(\mu_t) = 0$ , thus

$$\sigma_t^2 = \text{var}(\mu_t | \mu_{t-1}, \mu_{t-2}, \dots) = E[\mu_t^2 | \mu_{t-1}, \mu_{t-2}, \dots] \quad 4.12$$

The conditional variance of a zero mean normally distributed random variable is stated in equation (4.12), where  $\mu_t$  is equal to the conditional expected value of the square of  $\mu_t$ . Engle and Granger's (1982) concept comes from the fact that introducing the variance of the residuals  $\sigma^2$  depends on the past value, or has heteroskedasticity because the variance will change over time (Asteriou, 2006). Hence, the variance has to depend on the once-lagged period of the squared error terms as follows:

$$\sigma_t^2 = \gamma_0 + \gamma_1 \mu_{t-1}^2 \quad 4.13$$

The above equation is known as an ARCH (1) model, which simultaneously models the mean and the variance of the series with the following specification:

$$r_t = \alpha + \beta' X_t + \mu_t \quad \mu_t \sim N(0, \sigma_t^2) \quad 4.14$$

$$\sigma_t^2 = \gamma_0 + \gamma_1 \mu_{t-1}^2 \quad 4.15$$

The ARCH (1) model indicates that when a major shock occurs in period  $t - 1$ , it is more likely that the value of  $\mu_t$  will be greater as well. That is, when  $\mu_{t-1}^2$  is large or small, the variance of the next error term  $\mu_t$  is also large or small. The estimated coefficient of  $\gamma_1$  has to be positive for positive variance. The ARCH model implanted in the mean and variance equations were stated above respectively. The results of ARCH show that the model is stable.

#### 4.2.2.3 Ramsey Regression Equation Specification Error Test (RESET)

The Ramsey Regression Equation Specification Error Test (RESET) (Ramsey, 1969) is a general specification test for the linear regression model. More specifically, it tests whether non-linear combinations of fitted values help explain the response variable. The test is based on the notion that if non-linear combinations of the explanatory variables have any power in explaining the response variable, the model is mis-specified. The RESET is designed to examine the following types of specifications: omitted variables, incorrect functional form, and correlation between  $X$  and  $\mu$ , which give rise to a non-zero  $\mu$  vector. Accordingly, the null and alternative hypotheses are formalised as follows (Johnston, 1997):

- $H_0 : \mu \sim N(0, \sigma^2 I)$
- $H_1 : \mu \sim N(\mu, \sigma^2 I), \quad \mu \neq 0$

The test of  $H_0$  is based on an augmented regression

$$y = X\beta + Z\gamma + \varepsilon \quad 4.16$$

The test of specification error evaluates the restriction  $\gamma = 0$ . Ramsey's (1969) suggestion is that  $Z$  contains powers of the predicted values of the dependent variable, which are linear combinations of powers and cross-product terms of the explanatory variables:

$$Z = [\hat{y}^2 \ \hat{y}^3 \ \hat{y}^4] \quad 4.17$$

where  $\hat{y}$  is the vector of fitted values from the regression of  $y$  on  $X$ . The superscripts indicate the powers to which these predictions are raised. The first power is not included, since it is an exact linear combination of the columns of  $X$ .

#### 4.2.2.4 Testing for Structural breaks

The Quandt-Andrews Breakpoint tests for one or more unknown structural breakpoints in the sample for a specified equation. The idea behind the Quandt-Andrews breakpoint test is that a single Chow Breakpoint Test is performed at every observation between two dates, or observations,  $\tau_1$  and  $\tau_2$ . The  $k$  test statistics from the Chow tests are then summarised into one test statistic, in order to test against the null hypothesis of no breakpoints between  $\tau_1$  and  $\tau_2$ .

The individual test statistics can be summarised into three different statistics: the Sup or Maximum statistic, the Exp Statistic, and the Ave statistic (Andrews, 1993 and Andrews & Ploberger, 1994). The Chow test is an econometric test of whether the coefficients in two linear regressions on different data sets are equal.

To undertake Chow test, the regressions of equation number (4.2) are estimated and contain consistent parameters ( $\beta_1, \beta_2$  and  $\beta_3$ ) for the entire sample. The objective is to split the data into sub-periods and then estimate up to three models, for each sub-structure break and for all data and then compare the RSS of each model. The restricted regression is the regression for the whole period, but the unrestricted regression is for the sub-period. Therefore, the  $F$  test is implemented as follows (Brooks 2008):

$$test\ statistic = \frac{RSS - (RSS_1 + RSS_2)}{RSS_1 + RSS_2} \times \frac{T - 2K}{k} \quad 4.18$$

Where,  $RSS_1$  is the residual sum of squares for sub-period,  $RSS_2$  is the residual sum of squares for the second sub-period,  $T$  is the number of observations,  $2k$  is the number of regressors in the unrestricted regression and  $k$  is the number of regressors in each unrestricted regression.

The unrestricted regression, after the split of total observations is made, would be as follows:

$$y_t = \beta_1 + \beta_2 x_{2t} + \beta_3 x_{3t} + \beta_4 D_t + \beta_5 D_t x_{2t} + \beta_6 D_t x_{3t} + \mu_t \quad 4.19$$

Where,  $D_t = 1$  for  $t \in T_1$  and zero otherwise.  $D_t$  takes the value of one for observations in the first sub-period and zero in the second sub-period. Thus, the Chow test is a standard F-test<sup>5</sup> of the joint restriction  $H_0: \beta_4 = 0$  and  $\beta_5 = 0$  and  $\beta_6 = 0$ , with the equation number (4.2) and (4.19) restricted and unrestricted regressions respectively.

#### 4.2.2.5 Testing for Non-stationarity and Stationarity

Many economic and financial times series data show trending or non-stationary behaviour in the mean; relevant examples are interest rate, inflation and the level of macro-economic factors such as GDP. An important econometric task is to determine the most applicable form of trend in the data. For instance, in OLS modelling, the data must be transformed to a stationary form prior to analysis. If the data are trending, then some form of trend removal is required.

There are two common trend removal procedures, these first differencing, and time-trend regression. First differencing is suitable for  $I(1)$  times series, and time-trend regression is suitable for trend stationary  $I(0)$  time series. Unit root tests can be used to determine if trending data should be first differenced, or regressed on deterministic functions of time to render the data stationary. In order to test for non-stationarity and stationarity data, the following formula is considered (Galbraith & Zinde-Walsh, 1999):

$$y_t = \rho y_{t-1} + x_t \delta + \varepsilon_t \quad 4.20$$

where  $x_t$  are optional exogenous regressors, which may consist of constant or a constant and trend;  $\rho$  and  $\delta$  are parameters to be estimated; and the  $\varepsilon_t$  are assumed to be white noise. If  $\rho \geq 1$ ,  $y$  is a non-stationary series and the variance of  $y$  increases with time and approaches infinity if  $\rho < 1$ ,  $y$  is a trend-stationary series.

Therefore, the hypothesis of trend-stationary can be evaluated by testing whether the value of  $\rho$  is strictly less than one.

The standard Augmented Dickey-Fuller (ADF) test is carried out by the estimating equation (5.5) after subtracting  $y_{t-1}$  from both sides of the equation; that is, Where  $\alpha = \rho - 1$ . Thus, the null and alternative hypotheses may be written as:

$$H_0: \alpha = 0$$

$$H_1: \alpha < 0$$

The early pioneering work on testing for a unit root in time series was undertaken by Dickey and Fuller (1979). Their work finds that under the null hypothesis of a unit root, this statistic does not follow the conventional student's t-distribution and they derived asymptotic results and simulated critical value for various test and sample sizes. The simple Dickey-Fuller unit root test described above is valid only if the series is an AR (1) process. If the series is correlated at higher order lags, the assumption of white noise disturbances  $\varepsilon_t$  is violated. The ADF test is performed without including a constant or linear time trend.

A more comprehensive theory of unit root non-stationarity in time series was developed by Phillips and Perron (PP) (1988). The tests are similar to ADF tests, but incorporate an automatic correction to the DF procedure to allow for auto-correlated residuals when testing for a unit root. It is used in times series analysis to test the null hypothesis that a time series in integrated of order 1. According to Perron (1989) and Perron and Vogelsang (1992), the Phillips–Perron test for unit root provides better results in case of possible structural breaks in the time series. Therefore, both tests are implemented to determine the stationary variables and order of integration.

The PP method estimates the non-augmented DF test equation (4.20) and builds on the DF test of the null hypothesis  $\delta = 0$  in  $\Delta y_t = \delta y_{t-1} + \varepsilon_t$  where  $\Delta$  is the first difference operator. Similar to the ADF test, the PP test addresses the issue that the process generating data might have a higher order of autocorrelation than is admitted in the test equation. While the ADF test addresses this issue by introducing lags of  $\Delta$  as regressors in the test equation, the PP test makes a non-parametric correction to

the t-test statistic. The test is robust with respect to unspecified autocorrelation and heteroskedasticity in the disturbance process of the test equation. The tests usually return the same results as the ADF tests. The PP test was performed without including a constant or a constant and a linear time trend.

### **4.3. Summary**

The unlagged model for determining inward foreign direct and indirect investment (FDI and FII) in Jordan and Australia was developed as a result of received gaps in theory inherent in the literature review. In order to examine those countries' variable (financial health, economic health and political stability), trade openness, stock market price and macro-economic variables (such as inflation, interest rate behaviour) and their influence on the FDI and FII, the following methods were applied. First of all, OLS was employed under the normal assumptions. For example, each value of  $X_i$  and  $Y$  is observed without measurement error; the values of error terms  $\varepsilon$  are serially independent and each conditional distribution of  $\varepsilon_i$  has a mean of zero. Further, some regression diagnostic tests were implemented. For example, unit root tests (including the Augment Dickey-Fuller and Phillips-Perron tests, serial correlation tests including Durbin-Watson test, Breusch-Godfrey serial correlation LM test and White test) were applied for heteroskedasticity. Therefore, the unlagged OLS model is stable and provided robust results.

### **4.4. Lagged Model Methodology**

This study also endeavours to investigate the dynamic movements and behaviour of inward FDI and FII in Jordan and Australia, as examples of developed and developing economies that attract significant foreign investment (FDI and FII). The investigation is undertaken by implementing the following advance econometric techniques. Firstly, vector autoregressive (VAR) model Granger causality, impulse response functions and forecast error variance decompositions were utilised. Secondly, testing for long and short-term relationships, the following dynamic methods were used: Johansen's Cointegration test and Granger causality, impulse response functions and forecast error variance decompositions based on the Vector Error Correction Model (VECM).

Clearly, an effective time series modelling describes both long-term equilibrium and short-term dynamic relationships. For this purpose, Johansen's Cointegration test and VCEM are applied. Economic theory often suggests that a certain subset of variables should be linked by a long-term equilibrium relationship. Although the variable under consideration may shift away from equilibrium temporarily, economic forces of government actions may be expected to restore equilibrium. The Eigenvalue, Trace and Max.-Eigen tests are employed to determine the long-term relationships in the system. The VECM is a dynamic system with characteristics that the deviation of the current state from its long-term relationship will feed into its short-run dynamics. The VECM can be used to conduct the short-term effect of the exogenous variables on the endogenous variables as well the speed adjustment at which the exogenous variable return to equilibrium after a deviation has occurred.

Granger (1969) developed a test in order to answer the question of whether the exogenous variables are result of cause the endogenous variables and how much of the current endogenous variables can be explained by past values adding lagged values of exogenous variables. Impulse response functions describe how the economy reacts over time to exogenous impulses, which economists usually call 'shocks'. In this study, impulses are treated as exogenous from a macro-economic perspective by including changes in the government monetary base regarding inflation, interest rates, or other monetary policy parameters as well as country risks. Impulse response functions describe the reaction of the endogenous variables FDI and FII. Another method based on VECM is that the forecast error variance decomposes. The variance decomposition indicates the amount of information each variable contributes to the other variables in the auto-regression. It determines how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables.

#### **4.4.1 Vector Autoregressive (VAR) Model**

It is quite common in economics to have models where some variables are not only endogenous variables for a given exogenous variable. However, they are as well explained by the variables that they are used to determine. In those cases, the Vector autoregressive (VAR) model techniques are able to identify which are the independent and which are the dependent, variables. The VAR model techniques

have a long tradition as tools for time series analysis. Sims (1980) criticised the exogeneity assumptions and differentiation among the variables in simultaneous equations models. The VAR model's techniques became popular for economic analysis when Sims advocated them as alternatives to simultaneous equations models. The availability of longer and more frequently observed time series data emphasised the need for models that focused on dynamic movement among variables in the system (Asteriou, 2006).

The theory of VAR, according to Sims (1980), is that if there is simultaneity among a number of the variables, there should be no distinction between independent and dependent variables. To date, the VAR models techniques are used to forecast the interrelated time series data and analyse the dynamic influence of random disturbances of the system on the variables, with all observed variables being treated as endogenous. This means that each equation has the same set of regressors, which leads to the development of the VAR models techniques.

An exemplary VAR model analysis is conducted by specifying and evaluating it, as well as testing its adequacy. The VAR model revisions are made by stability tests until a satisfactory model has been found. The VAR model has, in fact, the advantage of treating each variable under study as an endogenous variable when economic theory cannot offer a priori information regarding the variables used in the VAR. This makes VAR estimation simple and OLS estimation method can be used provided all variables included in the VAR are integrated in the same order (Gujarati, 1995). In doing so, the time series  $y_t$  is affected by current and past values of  $x_t$ , simultaneously; moreover, the time series  $x_t$  is a series affected by current and past values of the  $y_t$  series. Therefore, the following simple bivariate VAR model is considered (Brooks, 2008):

$$y_t = \beta_{10} + \beta_{12}x_t + \gamma_{11}y_{t-1} + \gamma_{12}x_{t-1} + \varepsilon_{yt} \quad 4.21$$

$$x_t = \beta_{20} + \beta_{21}y_t + \gamma_{21}y_{t-1} + \gamma_{22}x_{t-1} + \varepsilon_{xt} \quad 4.22$$

where  $y_t$  and  $x_t$  are stationary, and  $\varepsilon_{yt}$  and  $\varepsilon_{xt}$  are uncorrelated white-noise error terms. These equations constitute a first order of VAR model, as the longest lag length is unity. Hence, equations (4.21) and (4.22) are not in reduced form since the  $\beta_{21}$  gives  $y_t$  a contemporaneous effect on  $x_t$ , and  $\beta_{12}$  gives  $x_t$  a contemporaneous

effect on  $y_t$ . The VAR system can be rewritten with the use of matrix form as follows:

$$\begin{bmatrix} 1 & \beta_{12} \\ \beta_{21} & 1 \end{bmatrix} \begin{bmatrix} y_t \\ x_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \end{bmatrix} + \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{21} \end{bmatrix} \begin{bmatrix} y_{t-1} \\ x_{t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{xt} \end{bmatrix} \quad 5.23$$

Or

$$B_{zt} = \Gamma_0 + \Gamma_1 z_{t-1} + \varepsilon_t \quad 4.24$$

Where:

$$B = \begin{bmatrix} 1 & \beta_{12} \\ \beta_{21} & 1 \end{bmatrix}, \quad z_t = \begin{bmatrix} y_t \\ x_t \end{bmatrix}, \quad \Gamma_0 = \begin{bmatrix} \beta_{10} \\ \beta_{20} \end{bmatrix}, \quad \Gamma_1 = \begin{bmatrix} \gamma_{11} & \gamma_{12} \\ \gamma_{21} & \gamma_{21} \end{bmatrix} \text{ and } \varepsilon_t = \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{xt} \end{bmatrix}$$

A VAR model in standard form could be written by multiplying both sides by  $B^{-1}$ , and then the following equation is obtained:

$$z_t = A_0 + A_1 z_{t-1} + \varepsilon_t \quad 4.25$$

Where:

$$A_0 = B^{-1}\Gamma_0, \quad A_1 = B^{-1}\Gamma_1 \text{ and } e_t = B^{-1}\varepsilon_t$$

Therefore the standard VAR model is:

$$y_t = a_{10} + a_{11}y_{t-1} + a_{12}x_{t-1} + e_{1t} \quad 4.26$$

$$x_t = a_{20} + a_{21}y_{t-1} + a_{22}x_{t-1} + e_{2t} \quad 5.27$$

The error terms,  $e_{1t}$  and  $e_{2t}$ , in the above equations (4.26) and (4.27) are composites of the two shocks,  $\varepsilon_{yt}$  and  $\varepsilon_{xt}$ . Thus, the error terms can be obtained since  $e_t = B^{-1}\varepsilon_t$  as:

$$e_{1t} = \frac{\varepsilon_{yt} + \beta_{12}\varepsilon_{xt}}{1 - \beta_{12}\beta_{21}} \quad 4.28$$

$$e_{2t} = \frac{\varepsilon_{xt} + \beta_{21}\varepsilon_{yt}}{1 - \beta_{12}\beta_{21}} \quad 4.29$$

Both the error terms  $e_{1t}$  and  $e_{2t}$  are White-noise processes since  $\varepsilon_{yt}$  and  $\varepsilon_{xt}$  are White-noise processes.

This study employs Johansen and Juselius (1990) approach to investigate the long-run relationship between equity fund price and the local stock market price. Hall (1991) suggests obtaining the best Johansen estimation results by using the minimum test statistic VAR length. To carry out this cointegration test, a vector autoregressive process first estimates the variables that supposedly can be cointegrated. To be specific, the VAR model of order  $p$  is written as follows:

$$Y_t = A_0 + \sum_{i=1}^p A_i Y_{t-i} + \varepsilon_t \quad 4.30$$

where,  $A_0$  is an  $(n \times 1)$  vector of constants,  $Y_t$  is an  $(n \times 1)$  vector of non-stationary  $I(1)$  variables,  $p$  is the number of lags of variables in the system,  $A_i$  is an  $(n \times n)$  matrix of coefficients and  $\varepsilon_t$  is the error term of the regression at time  $t$ .

The VAR model is presented in terms of a logarithmic price series based on Equation 4.30, which reduces to the following:

$$Y_t = \alpha \sum_{i=1}^p Y_{t-i} + \varepsilon_t \quad 4.31$$

$$Y = \{FR, ER, PR, OP, IS, INF, INT\}$$

In order to explore the relationship between the inward FDI, FII, country risk (financial health, economic health and political stability), trade openness, stock market price and macroeconomic environment (inflation rate and interest rate) the following models are specified as follows:

$$\ln(FDI_t) = \alpha_t + \beta_{1t} \logd(FR_t) + \beta_{2t} \logd(ER_t) + \beta_{3t} \logd(PR_t) + \beta_{4t} \logd(OP_t) + \beta_{5t} \logd(IS_t) + \beta_{6t} \logd(INF_t) + \beta_{7t} \logd(INT_t) + \varepsilon_t \quad 4.32$$

$$\ln(FII_t) = \alpha_t + \beta_{1t} \logd(FR_t) + \beta_{2t} \logd(ER_t) + \beta_{3t} \logd(PR_t) + \beta_{4t} \logd(OP_t) + \beta_{5t} \logd(IS_t) + \beta_{6t} \logd(INF_t) + \beta_{7t} \logd(INT_t) + \varepsilon_t \quad 4.33$$

This study undertakes a VAR lag order selection process using the model selection criteria to find the most parsimonious model. Endogenous variables are FDI, FII,

FR, ER, PR, OP, IS, INF and INT. The lag-length selection is discussed in the next section.

#### 4.4.1.1. Lag Length Selection Criteria in VAR Model

In the modelling of economic and financial time series, the VAR model techniques have become the standard linear model for in empirical analysis. Determining the lag order of the autoregressive lag polynomial is an important aspect of empirical research on the specification of VAR models, since all inferences in the VAR model depend on the correct model specification. Several studies have demonstrated the effect of lag length selection. Braun and Mittnik (1993) highlight that estimates of a VAR whose lag length differs from the accurate lag length are unreliable as the impulse response functions, variance decompositions and Granger causality are derived from the estimated VAR. In addition, Lütkepohl (1993) find that an increase in the mean square forecast errors of the VAR is caused by selecting a higher order lag length than the correct one and that under-fitting the lag length often generates auto-correlated errors. Thus, the lag selection in the VAR model criterion<sup>6</sup> is Akaike's (1973) information criterion (AIC), Schwarz (1978) information criterion (SIC), Hannan-Quinn criterion and (HQ) (Hannan & Quinn, 1978).

The VAR model techniques are simulated, using pre-specified model parameters, lag length, and a random number generator. The lag length is selected by each lag selection information criterion. Three different bivariate lag models are considered. The out-of-sample forecasting performance of the models selected by each lag selection criterion are also evaluated, as is the ability of each lag selection criterion to produce impulse response functions and forecast error variance decompositions and Granger causality that copies the true VAR model techniques function. Accordingly, a fitting lag length is selected for VAR, based on the selection lag information criterion.

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$$AIC(P) = \ln|\hat{\Sigma}| + \frac{2k^2p}{T} \quad 4.34$$

$$SIC(P) = \ln|\hat{\Sigma}| + \frac{k^2p \ln(T)}{T} \quad 4.35$$

$$HQIC(P) = \ln|\hat{\Sigma}| + \frac{2k^2p \ln \ln(T)}{T} \quad 4.36$$

Where  $k$  is the number of equations in the VAR model,  $T$  is the effective sample size,  $p$  is the number of lag terms in the model and  $\hat{\Sigma}$  represents the estimated covariance matrix of the fitted VAR ( $p$ ) model.

#### **4.4.2. Vector Error Correction Model and Cointegration**

The finding that many macro-economic and financial time series data may contain a unit root has stimulated the development of non-stationary time series analysis theory. Engle and Granger (1987) suggest that a linear combination of two or more non-stationary series may be stationary. If such a linear combination exists, the non-stationary time series data are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-term equilibrium relationship between the variables.

The VECM is considered as a restricted VAR that has cointegration restrictions built into the specification. It is designed for use with non-stationary time series data that are known to be co-integrated. The specification of VECM contain restricts the long-run behaviour of exogenous variables to converge their cointegrating relationships, while allowing for short-term adjustment dynamics. The cointegration term is known as the error correction term (ECT), since the deviation from long-term equilibrium is corrected gradually through a series of partial short-term adjustments. Therefore, Johansen and Juselius (1990) cointegration test is applied to capture the long-term dynamic relationships, whereas, Granger causality tests, impulse response functions and variance decomposition are applied based on VECM to capture the short-term dynamic relationships.

##### **4.4.2.1 Vector Error Correction Model (VCEM)**

Clearly, good time series modelling should define both short-term dynamic movements and the long-term equilibrium simultaneously. For this purpose, the error correction model is introduced in this study. The error correction model is a dynamic system with the characteristic that the deviation of the current state from its long-term relationship will be fed into its short-term dynamics. The error correction model can be used to determine the short-term effect of variables on endogenous exogenous variables, as well as the speed adjustment at which the exogenous variable returns to equilibrium after a deviation has occurred. Therefore, the VECM can be defined as follows (Asteriou, 2006):

$$\xi_t = y_t - \beta x_t \tag{4.37}$$

where,  $\beta$  is a co-integration coefficient,  $\xi_t$  is the error from the regression equation (4.2) of  $y_t$  on  $x_t$ . Thus, a VECM is constructed as

$$\Delta y_t = \alpha \xi_{t-1} + \gamma \Delta x_t + \mu_t \quad 4.38$$

The VECM equation number (4.38) expresses that the lagged  $\xi_{t-1}$  and  $\Delta x_t$  can explain  $\Delta y_t$ , where  $\xi_{t-1}$  can be an equilibrium error or disequilibrium error occurring in the previous period. Thus, if the error term ( $\xi_{t-1}$ ) is non-zero, the model is out of equilibrium and vice versa. The coefficient  $\alpha$  measures the speed of adjustment of endogenous variables towards the equilibrium.

Where  $\beta$  is the long-term parameter and  $\alpha$  and  $\gamma$  are short-term parameters, the VECM has both long-term and short-term properties built into. The former property is embedded in the error correction term ( $\xi_{t-1}$ ) and short-term behaviour is captured by the error correction coefficient. Further, the VECM provides the error correction terms (ECT), which can be constructed as follows:

$$\Delta X_t = A_0 + \sum_{i=1}^P \Gamma_i \Delta X_{t-i} + \delta ECT_{t-1} + \varepsilon_t \quad 4.39$$

The ECT is derived from the co-integration vectors and  $\delta$  records response of the dependent variable in each period  $t$ , the relationship for  $X_t$  can then be constructed as follows:

$$X_t = A_1 X_{t-1} + A_2 X_{t-2} + \dots + A_i X_{t-i} \quad 4.40$$

$$ECT_t = X_t - A_1 X_{t-1} + A_2 X_{t-2} + \dots + A_i X_{t-i} \quad 4.41$$

Therefore, the VECM is implemented to identify the speed of adjustment of ECT at which the inward FDI and FII in Jordan and Australia return to achieve equilibrium after a deviation has occurred. Also, the VECM is applied to capture the short-term effects of Jordan and Australia country risks (financial, economic and political risks), trade openness and stock market price and macroeconomic factors (inflation and interest rate) on the inward FDI and FII into those respective countries.

The study undertakes further analysis to investigate the short-run dynamics from a long-run equilibrium, so Johansen and Juselins' (1990) cointegration with the VECM framework is employed. The structure of the cointegration vector is assumed

to be the system of a VECM with a constant and linear deterministic trend. The VECM for the Johansen and Juselius' cointegration test is as follows:

$$\begin{aligned}
\Delta \log d(FDI)_t = & \beta_0 \sum_{j=1}^J \theta_j \Delta \log d(FR)_{t-j} + \sum_{l=1}^L \gamma_l \Delta \log d(ER)_{t-l} \\
& + \sum_{m=1}^M \varphi_m \Delta \log d(PR)_{t-m} + \sum_{p=1}^P \phi_p \Delta \log d(OP)_{t-p} \\
& + \sum_{k=1}^K \omega_k \Delta \log d(IS)_{t-k} + \sum_{q=1}^Q \vartheta_q \Delta \log d(INF)_{t-q} + \lambda ECT_{t-1} \\
& + \varepsilon_t
\end{aligned} \tag{4.42}$$

#### 4.4.2.2 Testing for Cointegration

Since many financial and macro-economic time series data may contain a unit root, this has stimulated the development of the theory of non-stationary time series data analysis. A link between non-stationary processes and the concept of a long-term relationship or equilibrium was introduced by Granger (1981). Engle and Granger (1987) developed a test for the existence of a cointegrating relationship among the variables in the system. The purpose of the cointegration test is to determine whether or not a group of non-stationary time series data are cointegrated. Another test to conduct the cointegration or the long-term relationship is that of Johansen and Juselius' (1990) test. This test is based on systems of equations unlike the Engle and Granger approach, which is based on a single equation. The Johansen and Juselius test is better in the sense of using maximum likelihood of a full system that provides two tests of maximum eigenvalue and trace test statistics to conduct the number of co-integrating vectors. Therefore, in this current study, Johansen and Juselius (1990) estimation technique is applied in order to define the cointegration as well as the number of cointegrating vectors.

A VAR with  $k$  lags containing co-integrated variables is specified as follows (Brooks, 2008):

$$y_t = \beta_1 y_{t-1} + \beta_2 y_{t-2} + \dots + \beta_k y_{t-k} + \mu \tag{4.43}$$

The above equation is transformed into VECM to apply the Johansen test as follows:

$$\Delta y_t = \Pi y_{t-k} + \Gamma_1 \Delta y_{t-1} + \Gamma_2 \Delta y_{t-2} + \dots + \Gamma_{k-1} \Delta y_{t-(k-1)} + \mu_t \quad 4.44$$

where,  $\Pi = (\sum_{i=1}^k \beta_i) - I_g$  and  $\Gamma = (\sum_{j=1}^k \beta_j) - I_g$

$g$  is the first difference form variable on the left hand side,  $k - 1$  represents lags of exogenous variables on the right hand side and  $\Gamma$  is a coefficient matrix. In fact, Johansen's (1990) approach is influenced by the lag length applied in the ECM. Thus, it is important to select the lag length appropriately (refer section 4.4.1.1). Johansen's approach centres around an examination of the  $\Pi$  matrix. Since all the  $\Delta y_{t-i} = 0$  and  $\Pi y_{t-k} = 0$ ,  $\Pi$  can be interpreted as a long-term coefficient matrix.

The Johansen approach has two statistical tests for cointegration, which can be formulated as follows:

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^g \ln(1 - \hat{\lambda}_i) \quad 4.45$$

and

$$\lambda_{max}(r, r + 1) = -T \ln(1 - \hat{\lambda}_{r+1}) \quad 4.46$$

Where  $T$  is the sample size,  $r$  is the number of cointegrating vectors under the null hypothesis and  $\hat{\lambda}_i$  is the estimated value for the row of matrix ordered eigenvalue from the  $\Pi$  matrix. Thus, a significantly non-zero eigenvalue indicates a significant co-integrating vector.

The  $\lambda_{trace}$  is a joint test where the null hypothesis is that the number of cointegrating vectors is less than or equal to  $r$  and the alternative hypothesis is that there are more than  $r$ . The  $\lambda_{max}$  conducts separate tests on each eigenvalue and the null hypothesis is that the number of co-integrating vectors is  $r$  against, an alternative hypothesis of  $r + 1$ .

There are five deterministic trend cases considered by Johansen (1995) and these are presented below:

- The level data  $y_t$  have no deterministic trends and the cointegrating equation does not have intercepts as follows:  $H_2(R): \Pi y_{t-1} + B x_t = \alpha \beta' y_{t-1}$

- The level data  $y_t$  have no deterministic trends and the cointegrating equation have intercepts as follows:  $H_1^*(r): \Pi y_{t-1} + Bx_t = \alpha(\beta' y_{t-1} + \rho_0)$
- The level data  $y_t$  have linear trends, but the cointegrating equations have only intercepts:  $H_1(r): \Pi y_{t-1} + Bx_t = \alpha(\beta' y_{t-1} + \rho_0 + \rho_1 t) + \alpha_{\perp} \gamma_0$
- The level data  $y_t$  and the cointegrating equations have linear trends as follows:  $H^*(r): \Pi y_{t-1} + Bx_t = \alpha(\beta' y_{t-1} + \rho_0 + \rho_1 t) + \alpha_{\perp} \gamma_0$
- The level data  $y_t$  have quadratic trends and the cointegrating equations have linear trends as follows:  $H(r): \Pi y_{t-1} + Bx_t = \alpha(\beta' y_{t-1} + \rho_0 + \rho_1 t) + \alpha_{\perp}(\gamma_0 + \gamma_1 t)$

The terms associated with  $\alpha_{\perp}$  are the deterministic terms for the cointegrating relationship. The decomposition is not unique when a deterministic term appears both inside and outside the co-integrating relationship.

Hence, the Johansen approach is applied in order to determine the long-term relationship between the endogenous variables, which are the foreign direct and indirect investments in Jordan and Australia as well as endogenous exogenous variables in the model (which include country risks, macro-economic factors and globalisation).

#### 4.4.2.3. Testing for Exogeneity: Block Exogeneity Wald Tests

Granger causality is a technique used for determining whether one time series is effective for forecasting another. The causality concept refers to the ability of one variable to predict or cause the other variable. According to Granger (1969), the theory of causality refers to how much of the current  $y$  can be explained by past values of  $y$  and if introducing lagged values of  $x$  can improve the explanation. In other words, Granger defines the variable  $y$  to be causal for another time series variable  $y$  whether the former helps predicting the latter. Thus,  $x$  Granger causes  $y$ , does not imply that  $y$  is the effect or result of  $x$ .

According to Granger (1969) and Engle and Granger (1987), in conducting the Granger-causality test, two complementary strategies are applied. The first one, called the indirect approach, assumes that the variables are stationary or can be made stationary by differencing. It makes use of pre-testing for unit roots and cointegration, which depend on the outcomes. Testing for causality is undertaken

within VECM of different specifications. When both series are deemed  $I(0)$ , a VAR model in levels is used. When one of the series is found  $I(0)$  and the other one  $I(1)$ , VAR model is specified in the level of the  $I(0)$  variable and in the first difference of the  $I(1)$  variable. When both series are determined  $I(1)$ , but not cointegrated, the proper model is VAR in terms of the first differences. Finally, a VECM or a VAR model in levels can be employed, when the series are cointegrated.

In this study, Granger causality test is implemented from a VECM framework. Hence, the Granger causality test involves as a first step the estimation of the following VAR model:

$$y_t = a_1 \sum_{i=1}^n \beta_i x_{t-i} + \sum_{j=1}^m \gamma_j y_{t-j} + \varepsilon_{1t} \quad 4.47$$

$$x_t = a_2 \sum_{i=1}^n \theta_i x_{t-i} + \sum_{j=1}^m \delta_j y_{t-j} + \varepsilon_{2t} \quad 4.48$$

Where  $\varepsilon_{yt}$  and  $\varepsilon_{xt}$  are uncorrelated white –noise error terms,  $n$  and  $m$  are lag-length. In this model, there can be different cases and these are presented below:

The first case, when  $x_t$  Granger causes  $y_t$ , means that the lagged  $x$  term in the equation number (4.47) is statistically different from zero as a group and the lagged  $y$  term in the equation number (4.48) is not statistically different from zero. In other words, the null and alternative hypotheses of equation number (4.47) can be written respectively as follows:

$$H_0: \gamma_1 \neq 0, \gamma_m = 1, 2, \dots$$

$$H_1: \delta_j = 0, j = 1, 2, \dots$$

The second case is that  $y_t$  Granger causes  $x_t$ ; this means the lagged  $y$  term in equation number (4.48) is statistically different from zero as group and the lagged  $x$  term in the equation number (4.47) is not statistically different from zero. Thus, the null and alternative hypotheses can be written as follows:

$$H_0: \delta_j \neq 0, j = 1, 2, \dots$$

$$H_1: \gamma_1 = 0, y_m = 1, 2, \dots$$

The third case is where the Granger is bi-directional causality, when both sets of  $x$  and  $y$  terms are statistically different from zero in equations (4.47) and (4.48).

Hence, the null and alternative hypotheses are as follows:

$$H_0: \delta_j \text{ and } \gamma_1 \neq 0, j, y_m = 1, 2, \dots$$

$$H_1: \delta_j \text{ and } \gamma_1 = 0, j, y_m = 1, 2, \dots$$

The final case is where  $x_t$  is independent of  $y_t$ , and both sets of  $x$  and  $y$  terms are not statistically different from zero in equations (4.47) and (4.48). Thus, the null hypotheses are written as follows:

$$H_0: \delta_j \text{ and } \gamma_1 = 0, j, y_m = 1, 2, \dots$$

$$H_1: \delta_j \text{ and } \gamma_1 \neq 0, j, y_m = 1, 2, \dots$$

In order to examine the Granger causality in equation (4.47), the following steps are employed:

$y_t$  is regressed on lag  $y$  terms to acquire the  $RSS_R$  of this regression, which is restricted as in the next model:

$$y_t = a_1 + \sum_{j=1}^m \gamma_j y_{t-j} + e_{1t} \quad 4.49$$

In order to obtain the  $RSS_U$  unrestricted  $y_t$  is regressed on lagged  $y$  terms, including lagged  $x$  terms as follows:

$$y_t = a_1 + \sum_{i=1}^n \beta_i x_{t-i} + \sum_{j=1}^m \gamma_j y_{t-j} + e_{1t} \quad 4.50$$

The null and alternative hypotheses can be written as follows:

$$H_0: \sum_{i=1}^n \beta_i = 0$$

$$H_1: \sum_{i=1}^n \beta_i \neq 0$$

Therefore, the rejection of the null hypothesis appears when the  $F$  value<sup>7</sup> exceeds the  $F$ -critical value.

Thus, the Granger causality test is implanted in the E-views package to determine whether one time series is useful in forecasting another. In this study, Granger causality is employed to estimate the direction of causality, the ability of one variable to cause the other variable and how much the current inward FDI and FII in Jordan and Australia can be explained by the country risks (financial, economic and political risk), globalisation or trade openness (exports plus imports as percentage of GDP), stock market price and macro-economic factors (inflation and interest rate).

#### 4.4.2.4. Other Tests of Exogeneity: Impulse Response Function

Impulse responses trace the response of current and future values of each variable to a one-unit increase (or to a one-standard deviation increase, when the scale matters) in the current value of one of the VAR errors, assuming that this error returns to zero in subsequent periods and that all other errors are equal to zero. The implied thought experiment of changing one error while holding the others constant makes most sense when the errors are un-correlated across equations, in order to demonstrate how the impulse responses function operates, the VAR model is written as a vector moving average (VMA) (Enders, 2004): In this study, the Cholesky decomposition method is used to in order the variables, based on the high potential influence of other variables in the system, followed by the rank of ECT magnitude.

$$x_t = A_0 + A_1 x_{t-1} + e_t \quad 4.51$$

Where:  $A_0 = B^{-1}\Gamma_0$ ,  $A_1 = B^{-1}\Gamma_1$ ,  $e_t = B^{-1}\varepsilon_t$

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<sup>7</sup> The  $F$  statistic is calculated for the normal Wald test on coefficient restrictions given by the following formula:

$$F = \frac{(RSS_R - RSS_U)/m}{RSS_U/(n-k)}$$

Where  $F_{m, n-k}$  is distribution and  $k = m + n1$ .

For notational purpose,  $a_{i0}$  is defined as an element of  $i$  of the vector,  $A_0$ ,  $a_{ij}$  as the element in row  $i$  and column  $j$  of the matrix  $A_1$  and  $e_{it}$  as the element  $i$  of the vector  $e_t$ . The above equation can be written in the following equivalent form:

$$y_t = a_{10} + a_{11}y_{t-1} + a_{12}z_{t-1} + e_{1t} \quad 4.52$$

$$z_t = a_{20} + a_{21}y_{t-1} + a_{22}z_{t-1} + e_{2t} \quad 4.53$$

where  $y_t$  and  $z_t$  are expressed in terms of the current and past values of the two types of shocks,  $e_{1t}$  and  $e_{2t}$ . The VMA illustrates an essential feature the analysis of Sim (1980), which allows tracing out the time path of the various shocks on the variables contained in the VAR model. The two variables of VAR can be written in matrix form as:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} e_{1t-i} \\ e_{2t-i} \end{bmatrix} \quad 4.54$$

From equations (4.28) and (4.29) the vector of the errors can be written as:

$$\begin{bmatrix} e_{1t} \\ e_{2t} \end{bmatrix} = \frac{1}{1 - b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt} \\ \varepsilon_{zt} \end{bmatrix} \quad 4.55$$

The above two equations (4.54) and (4.55) can be combined to form the following:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y}_t \\ \bar{z}_t \end{bmatrix} + \frac{1}{1 - b_{12}b_{21}} \sum_{i=0}^{\infty} \begin{bmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{bmatrix}^i \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \begin{bmatrix} \varepsilon_{yt-i} \\ \varepsilon_{zt-i} \end{bmatrix} \quad 4.56$$

The matrix  $\Phi_i$  can be defined with elements  $\Phi_{jk}(i)$ :

$$\Phi_i = \frac{A_1^i}{1 - b_{12}b_{21}} \begin{bmatrix} 1 & -b_{12} \\ -b_{21} & 1 \end{bmatrix} \quad 4.57$$

Equations (4.54) and (4.55) represent the vector moving average (VMA) and can be written in term of the  $\varepsilon_{yt}$  and  $\varepsilon_{zt}$  sequences:

$$\begin{bmatrix} y_t \\ z_t \end{bmatrix} = \begin{bmatrix} \bar{y} \\ \bar{z} \end{bmatrix} + \sum_{i=0}^{\infty} \begin{bmatrix} \Phi_{11}(i) & \Phi_{12}(i) \\ \Phi_{21}(i) & \Phi_{22}(i) \end{bmatrix} \begin{bmatrix} \varepsilon_{yt-i} \\ \varepsilon_{zt-i} \end{bmatrix}$$

Or, more compactly,

$$x_t = \mu + \sum_{i=0}^{\infty} \phi_i \varepsilon_{t-i} \quad 4.58$$

The four sets of coefficients,  $\phi_{11}(i)$ ,  $\phi_{12}(i)$ ,  $\phi_{21}(i)$  and  $\phi_{22}(i)$ , are called the impulse response functions. The coefficient of  $\phi_i$  can be used to generate the effects of  $\varepsilon_{yt}$  and  $\varepsilon_{zt}$  shocks on the entire time paths of  $y_t$  and  $z_t$  sequences. Therefore, the impulse responses function is implanted to investigate which of the exogenous variables in the model including country risks (financial, economic and political risks), trade (exports, imports and stock market price) and macroeconomic (inflation, interest rate and GDP) have statistically significant impacts on the future values of each of the endogenous FDI and FII flow into Jordan and Australia.

#### 4.4.2.5. Other Tests of Exogeneity: Forecast Error Variance Decompositions

Forecast error variance decomposition (FEVD) is an econometric tool used by many economists in the VECM context for assessing the driving forces of business cycles. Given that many macro-economic models can also be written in the VECM form, the variance decomposition indicates the amount of information each variable contributes to other variables in the auto-regression. The FEVD is used to aid in the interpretation of a VECM once it has been fitted, and to determine how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables.

Variance decomposition offers a slightly different method for examining the VECM system dynamic. It gives the proportion of movements in the exogenous variables that are due to their own shock, versus shocks to the other variables. In this study, the Cholesky decomposition is used to order variables based on the high potential influence on other variables in the system followed by the rank of ECT magnitude.

Thus, the coefficients of  $A_0$  and  $A_1$  are known and needed to forecast the various values of  $x_{t+i}$  conditional on the observed value of  $x_t$  by updating the equation number (4.51) through taking the conditional expectation of  $x_{t+1}$ . Following Ender (2004) the sequencing is as follows:

$$E_t x_{t+1} = A_0 + A_1 x_t$$

Generally, verifying the n-step-ahead forecast is:

$$E_t x_{t+n} = (1 + A_1 + A_1^2 + \dots + A_1^{n-1})A_0 + A_1^n x_t$$

Therefore, the associated forecast error as follows:

$$e_{t+n} + A_1 e_{t+n-1} + A_1^2 e_{t+n-2} + \dots + A_1^{n-1} e_{t+1} \quad 4.59$$

These forecast errors can be considered in terms of VMA of the structural VAR model of equation number (4.58), as well as the forecast errors in terms of the  $\varepsilon_t$  sequence. In general, employing equation (4.58) to forecast  $x_{t+1}$ , the one-step-ahead the forecast error is  $\phi_0 \varepsilon_{t+1}$ .

$$x_{t+n} = \mu + \sum_{i=0}^{\infty} \phi_i \varepsilon_{t+n-i}$$

Where, the n-period forecast error is  $-E_t x_{t+n}$ . The n-step-ahead forecast error of  $y_t$  sequence is:

$$\begin{aligned} y_{t+n} - E_t y_{t+n} &= \phi_{11}(0) \varepsilon_{y_{t+n}} + \phi_{11}(1) \varepsilon_{y_{t+n-1}} + \dots + \phi_{11}(n-1) \varepsilon_{y_{t+1}} \\ &+ \phi_{12}(0) \varepsilon_{z_{t+n}} + \phi_{12}(1) \varepsilon_{z_{t+n-1}} + \dots + \phi_{12}(n-1) \varepsilon_{z_{t+1}} \end{aligned}$$

The variance of the forecast error increases as the forecast horizon  $n$  increases. Therefore, it is possible to decompose the n-step-ahead forecast error variance into the proportions of  $y_{t+n}$ , which is denoted as  $\sigma_y(n)^2$  due to each shock in the  $\varepsilon_{y_t}$  and  $\varepsilon_{z_t}$  respectively, as follows:

$$\frac{\sigma_y^2 [\phi_{11}(0)^2 + \phi_{11}(1)^2 + \dots + \phi_{11}(n-1)^2]}{\sigma_y(n)^2} \quad 4.60$$

and

$$\frac{\sigma_z^2 [\phi_{12}(0)^2 + \phi_{12}(1)^2 + \dots + \phi_{12}(n-1)^2]}{\sigma_z(n)^2}$$

Indeed, the forecast error variance decomposition indicates the proportion of movements in a sequence due to its own shocks, versus shocks to other variables. The  $y_t$  sequence is considered exogenous, when  $\varepsilon_{z_t}$  shocks do not explain the forecast error variance of  $y_t$  in the forecast horizon. In this case,  $y_t$  evolves

endogenously from the  $\varepsilon_{zt}$  shocks and of the  $z_t$  sequence. However, the  $y_t$  will be considered as entirely endogenous, when  $\varepsilon_{zt}$  shocks could explain all of the forecast error variance in the  $y_t$  sequence of all forecast horizons. In the current applied research, the forecast error variance decomposition is employed to determine the major drive of inward FDI and FII in Jordan and Australia by forecasting error variance decomposition of endogenous variables at short horizon and smaller proportions of at longer horizons.

#### **4.4.2.6 Summary**

The lagged models are introduced to the current study to explore the dynamic movements and behaviour of inward FDI and FII in Jordan and Australia. The latter country is considered in this study for the purpose of comparison with Jordan as it is a developed economy and attracts a massive amount of foreign investment (FDI and FII). Whereas, Jordan represents developing countries in Middle East. The results of the comparison could may possible policy implications for Jordan, which could benefit from the Australian experience and enhance its inflows of foreign investment.

Clearly, good time series modelling may describe both long-term equilibrium and short-term dynamic relationships. For this purpose, the VAR model is applied to determine the lag length. The VECM is applied to test the short term-relationships among exogenous and endogenous variables in the system. Johansen's cointegration test is implemented based on the VECM to illustrate long-term equilibrium relationships. Therefore; based on VECM the Granger causality test is applied, impulse response functions and variance decomposition function to capture the short-term relationships.

#### **4.5 Data**

In this study, unlagged and lagged econometric techniques are applied in order to test the argument that Jordanian and Australian country risks, economic factors and globalisation related factors influence inward foreign direct and indirect investment. Models are formalised, based on theory of foreign investment and to address the gap in the literature. Moreover, the following methods are applied: unlagged techniques such as (OLS) regression analysis and lagged techniques such as cointegration and

exogeneity analysis based on multivariate models (lagged monthly data) such as (VAR) and (VECM).

The sample period covered monthly data from 1996 to 2010 for several reasons including: to determine the effects of moving forward to liberalised trade in Jordan; to capture the influence of macro-economic policies on inward foreign investment in Jordan since the establishment of the Jordan Investment Board; and, to determine the extent to which Jordanian policies attract foreign investment to Jordan's economy.

Australia is considered in this study in order to provide a comparison and obtain some policy implications, which could enhance and improve Jordanian micro-and macro-policies. Other reasons for considering Australia include: firstly, the country has an AAA international credit rating with a well-developed, deep and sophisticated financial market, regulated in accordance with international criteria. Secondly, in terms of global turnover, Australia's foreign exchange market is the seventh largest in the world, and the Australian dollar/U.S. dollar is the fourth most traded currency pair globally. Further, the total stock of foreign investment in Australia stood at almost \$2 trillion as at December 2010. Portfolio investment made up 58% of total foreign investment in Australia, while direct investment contributed 24%. Over the five years to 2010, the world's investment in Australia has grown by 59%, with foreign direct investment expanding by the same amount. The Australian economy retained a robust level of foreign investment in 2010 despite global economic disruption associated with the GFC. Therefore, this section addresses the following subjects: data resources, movements of variables behaviour, descriptive statistics and basic hypothesis testing.

#### **4.5.1. Data Resources**

The current study used historical monthly data, drawn from the period 1996-2010. Financial, economic and political risk data were obtained from the International Country Risk Guide (ICRG). As inward FDI in Jordan, GDP, (the data of which have been converted to monthly data using the Chow and Lin technique), trade openness, interest rate and inflation data were collected from the Central Bank of Jordan (CBJ), and stock market price data were collected from the Amman Stock Exchange (ASX). The inward FII in Jordan data were collected from the Amman Stock Exchange

Market. Australian data were also obtained from various sources. Inward FDI and FII in Australia, represented by trade openness, stock market price and macroeconomic factors data were obtained from the Reserve Bank of Australia and Australia Bureau of Statistics. Further, stock market price data for Australia were collected from the DataStream.

Information on financial, economic and political risks and institutions was obtained from the International Country Risk Guide (ICRG), provided by the Political Risk Services (PRS) Group. According to Howell (2011), the PRS Group has provided information covering 22 variables in three subcategories of risk (financial, economic and political) since 1984. An individual index is made for each of the subcategories, with financial and economic risk rate each having five components and political risk comprising 12 components (and 15 sub-components). Financial risk is based on 50 points, economic risk on 50 points and the political risk index is based on 100 points. Each component is assigned a maximum numerical value (risk points), with the highest number of points indicating the lowest potential risk for that component and the lowest number (0) indicating the highest potential risk.

The purpose of the ICRG financial risk Rating is to measure a country's ability to finance its official, commercial, and trade debt obligations. Thus, the ICRG financial risk rating can be considered as an indicator of a country's likelihood of having a financial crisis in the coming years. According to the ICRG, the financial risk rating has five subcomponents (Hayakawa et al., 2011 and Howell, 2011) They are defined as follows:

- Foreign Debt as a percentage of GDP: expressed as a percentage of the gross domestic product converted into US dollars at the average exchange rate for that year.
- Foreign Debt Service as a percentage of Exports of Goods and Services: is expressed as a percentage of the sum of the estimated total exports of goods and services for that year, converted into US dollars at the average exchange rate for that year.
- Current Account as a percentage of exports of goods and services: expressed as a percentage of the sum of estimated total exports of goods and services

that year, converted into US dollars at the average exchange rate for that year.

- Net International Liquidity as Months of Import Cover: the total estimated official reserves for a given year, converted into US dollars at the average exchange rate for that year. The US dollar amount including official holdings of gold, converted into US dollars at the free market price for the period. However, the amount excludes the use of IMF credits and foreign liabilities of the monetary authorities. Rather, it is divided by the average monthly merchandise import cost, converted into US dollars at the average exchange rate for the period.
- Exchange Rate Stability: the appreciation or depreciation of a currency against the US dollar over a calendar year or the most recent 12-month period is calculated as a percentage change.

The purpose of the ICRG Economic Risk Rating is to determine a country's current economic strengths and weaknesses. In general terms, where a country's strengths outweigh its weaknesses, it will present a low economic risk; where its weaknesses outweigh its strengths, it will present a high economic risk. According to the ICRG, economic risk rating has five subcomponents (Hayakawa et al., 2011 and Howell, 2011). They are defined as follows:

- GDP per Head: expressed as a percentage of the average of estimated total GDP of all the countries covered by ICRG.
- Real GDP Growth: the annual change in the estimated GDP, at constant 1990 prices, of a given country is expressed as a percentage increase or decrease.
- Annual Inflation Rate: The estimated annual inflation rate (the unweighted average of the Consumer Price Index) is calculated as a percentage change.
- Budget Balance as a percentage of GDP: the estimated central government budget balance (including grants) for a given year in the national currency is expressed as a percentage of the estimated GDP for that year in the national currency.
- Current Account as a percentage of GDP: expressed as a percentage of the estimated GDP of the country concerned and converted into US dollars at the average rate of exchange for the period covered.

The purpose of the political risk rating is to provide a means of assessing the political stability of the country. Since 1984, the PRS Group has provided information on 12 risk indicators that address not only political risk, but also various components of political institutions (Busse & Hefeker, 2007; Hayakawa et al., 2011 and Howell, 2011). They are defined as follows:

- Government stability measures the government's ability to carry out its policies and to stay in office; risk subcomponents include government unity, legislative strength, and popular support.
- Socio-economic pressures at work in society might restrain government action or elevate social dissatisfaction and thus destabilise the political regime, risk subcomponents such as unemployment, consumer confidence and poverty.
- Investment profile is an assessment of factors related to the risk of investment that are not covered by other (financial and economic) risk components, such as contract viability (expropriation), profits repatriation or payment delays.
- Internal conflict determines political violence in the country and its actual or potential influence on governance by concentrating on, for example, civil war, terrorism, political violence or civil disorder.
- External conflict is an estimation of the risk to the incumbent government from foreign action, ranging from non-violent external pressure, such pressure ranges from diplomatic pressures, withholding aid or trade sanctions, to violent external pressures,( in turn, ranging from trans-border conflicts to all-out war).
- The level of corruption is an estimation of corruption within the political system.
- Military presence in politics shows the effect of the Military on politics, which may indicate that the government is powerless to function effectively and that the country may be an unsound environment for business.
- Religious tensions indicate from the domination of society and/or governance by a single religious group looking to replace civil law with religious law, or to exclude other religions from the political and social process.
- Law and order represents the strength and impartiality of the legal system.

- Ethnic tension measures the degree of tensions between ethnic groups, attributable to racial, nationality or language divisions.
- Democratic accountability relates to the responsiveness of a government to its citizens, in terms of fundamental civil liberties and political rights.
- Bureaucracy quality refers to the institutional strength and quality of the bureaucracy, which in turn can act as a shock absorber to minimise policy revisions in terms of change of government.

Pritchett (1996) defines trade openness “as an economy’s trade intensity”. In other words, geography, population, culture and trade policy are only some of the factors that determine the trade volume of a given country and are usually measured by the trade share to GDP. Several studies (For example, Asiedu, 2002; Neumayer & de Soysa, 2005; Constant & Yue, 2010 and Babatunde, 2011) have shown that the role of trade openness in attracting FDI and FII cannot be ignored. In these studies trade openness is measured in terms of imports plus exports as percentage of GDP.

The quarterly GDP time series data were converted into monthly data using the Chow and Lin (1971) procedure<sup>8</sup>. Several researchers (for example, Bernanke & Mihov, 1995; Gerdesmeier & Roffia, 2003 and Hussain, 2009) have applied the

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<sup>8</sup> In order to illustrate the method,  $y$  is the monthly values of one of the GDP components and  $X$  is a set of variables available monthly and contain information about  $y$ .

$$y = X\beta + \mu \quad 4.61$$

Where  $V = E(\mu\mu')$ . The monthly error term  $\mu$  is  $AR(1)$  with unknown serial correlation coefficient  $\rho$  and  $V$  is the error covariance matrix formulated as follows:

$$V = E\mu\mu' = \begin{bmatrix} 1 & a & a^2 & a^{3n-1} \\ a & 1 & a & a^{3n-2} \\ a^2 & a & 1 & a^{3n-3} \\ a^{3n-1} & a^{3n-2} & a^{3n-3} & 1 \end{bmatrix}$$

$$\frac{\sigma^2}{1 - a^2} = A \cdot \frac{\sigma^2}{1 - a^2} \quad 4.62$$

Taking quarterly averages of equation (4.50) to obtain the following equation:

$$C_y = CX\beta + C\mu \quad 4.63$$

or  $y = X \cdot \beta + \mu$ .

where  $C$  is the  $t \times 3t$  matrix that converts monthly observations to quarterly averages, where a dot subscript is a quarterly average. The  $V = E(C\mu\mu'C') = E(CVC')$  is the quarterly error covariance matrix. Finally, the estimated monthly values for the GDP component  $\hat{y}$  are computed by Chow-Lin’s formula as follows:

$$\hat{y} = X\hat{\beta} + \hat{V}C'(CV'C')^{-1}\hat{\mu} \quad 4.64$$

Chow and Lin technique to convert quarterly GDP data to monthly data. In doing so, GDP is observable at the quarterly frequency, but the indicators used to disaggregate it are observable at the highest frequency; when the data are available on a monthly basis, and are potentially informative variables.

The development of a domestic financial system can measure the ability of foreign firms to borrow in order to continue their innovative activities in the host country. Inward FDI and FII activities, as measured by financial flow data, may be only part of the FDI inflows into developed and developing countries. This result of some of the investment being financed through debt and/or equity coming from financial markets in the host countries (Borensztein et al., 1998). Therefore, the stock market price is also considered in order to measure development of the financial market and efficiency in providing information; these reflect the stock market price and the values of foreign investment in the host country.

Finally, inflation and interest rate are used to measure the stability of the macro-economic environment. The inflation rate is computed as the percentage change in the Consumer Price Index (CPI). For the interest rate, the 30-day bank-accepted bill rate is used. This series is used because it is considered to be a representative market-determined rate. In this study, Jordanian and Australian data are based on US dollar currency to allow comparison between the two countries and examination of policy implications. Table 4.1 shows the data resources.

**Table 4.1: The Variables: Description of Data Resources**

Variable	Sub-variables	Description	Jordanian Source of Data	Australian Source of Data
<b>FDI</b>	Not applicable	Inward Foreign Direct Investment	Central Bank of Jordan	Reserve Bank of Australia
<b>FII</b>	Not applicable	Inward Foreign Indirect Investment	Amman Stock Exchange	DataStream ,Australian bureau of statistics
<b>Country Risk</b>	(FR)	Financial Risk	International Country Risk Guide	International Country Risk Guide
	(ER)	Economic Risk	International Country Risk Guide	International Country Risk Guide
	(PR)	Political Risk	International Country Risk Guide	International Country Risk Guide
<b>Globalisation</b>	(OP)	Trade Openness	Central Bank of Jordan	DataStream
	(ST)	Stock Market Price	Amman Stock Exchange	DataStream
<b>Macroeconomic Factors</b>	(INF)	Inflation Rate	Central Bank of Jordan	Reserve Bank of Australia
	(INT)	Interest Rate	Central Bank of Jordan	Reserve Bank of Australia

#### 4.5.2 Structural Break Detection

In the econometrics, Quandt-Andrews and Chow data tests are most commonly used to determine the presence of a structural break in time series analysis. The idea of the breakpoint is to fit the equation separately for each sub-sample and to examine whether there are significant differences in the estimated equations. The null hypothesis related to the structural change is that there is no structural change in the series, against the alternative hypothesis that there is a structural change in the series. The results of testing structural breaks are reported in Table 4.2.

**Table 4.2: Structural Breakpoint of Time Series Data**

Equation	Breakpoint	F-statistic	p-value
Jordanian FDI FII	December 2001	11.49541	0.6919
Jordanian FDI FII	July 2007	10.82253	0.3450
Australian FDI FII	May 2005	4.073809	1.000
Australian FDI FII	July 2007	7.049551	0.9999

Table 4.2 illustrates the structural breakpoint of time series data for Jordanian and Australian (FDI and FII). It can be seen that the results of Quandt-Andrews breakpoint and Chow tests indicate that the structural breakpoint in Jordanian (FDI and FII) data are December 2001 and July 2007. In the case of Australia, the structural break tests indicate breakpoints in May 2005 and July 2007.

The following Chapter Five discusses the preliminary results of the ARCH model in determining inward FD in Jordan and Australia based on the full period (1996-2010) these are three structural breaks in the Jordanian times series data as follows: from the Qualifying Industrials Zones (1996) to Free Trade Agreement (2001); from the Qualifying Industrials Zones (1996) to Global Financial Crisis (2008); and from the Free Trade Agreement (2001) to the Global Financial Crisis (2008). In the case of Australia, the three structural breaks as follows: from 1996 to Free Trade Agreement with U.S 2005; from 1996 to the Global Financial Crisis (2008) and From Free Trade Agreement with U.S to the end of the study period 2010.

#### 4.6. Conclusion

In order to investigate whether the Jordanian and Australian country risks (financial, economic and political risks), trade openness, stock market price and macro-economic factors (inflation and interest rate) influence the flows of inward FDI and

FII into Jordan and Australia, the current study used monthly data (1996-2010). These data were gathered from various sources, such as Central Bank of Jordan, Amman Stock Exchange, Reserve Bank of Australia and DataStream. According to the Theory of Structural Breakpoint by Chow (1960), the data were split into three periods. Furthermore, the unlagged model uses OLS to help explain the interaction between variables and contemporaneous relationships. In order to achieve robust OLS results, several diagnostic tests were applied, including the Breusch-Godfrey serial correlation LM test and the White test for heteroskedasticity. The following Chapter Five reports and discusses the preliminary determinants of inward FDI and FII using unlagged models.

With regard to the main analysis later reported in Chapter Six, the lagged model describes both long-term equilibrium and short-term dynamics. First, the VAR model is employed in order to determine the lag length by using lag length criteria Akaike's (1973) information criterion, Schwarz (1978) information criterion and Hannan-Quinn (1978) criterion. The VCEM and Granger causality method were applied to capture the short-term relationship among exogenous and endogenous variables in the system. Secondly, Johansen's Cointegration test, the impulse response function, and variance decomposition function were implemented, based on the VECM to illustrate and confirm long-term and short-term relationships.

## CHAPTER FIVE

### PRELIMINARY ANALYSIS AND DISCUSSION

#### 5.1 Chapter Overview

The unlagged theoretical models developed in the previous Chapter are empirically tested and the findings are presented in this Chapter. The model seeks to investigate how a country's risks (financial, economic and political risks), trade openness, stock market price and macroeconomic factors (inflation, and interest rate) may contemporaneously influence the volume of inward FDI and FII in Jordan and Australia, with consideration of the times series structural breaks. In order to show the effects of trade agreements, GFC and full period on Jordan and Australia and to arrive at possible policy implications structural breaks are considered.

In this study, unlagged models are employed (ARCH) to better clarify the interaction between FDI, FII, country risks, trade openness, stock market price and macroeconomic factors time series data. Further, diagnostic tests, such as the augmented normality test, Breusch-Godfrey serial correlation LM test and heteroskedasticity test are also conducted to obtain robust results. This Chapter reports the preliminary findings of full and three structural breaks for inward FDI and FII in Jordan and Australia. This followed by a discussion of the main preliminary relationship with inward FDI and FII in Jordan and Australia.

#### 5.2. Analysis of Structural Break of Inward FDI and FII Time Series in Jordan

The diagnostic tests for structural breaks for Jordan are reported in the data section of the previous Chapter and the study periods are identified for both Jordan and Australia. This section presents the preliminary results of determining inward FDI and FII in Jordan based on a full period of study and three structural breaks in the Jordanian times series data based on the ARCH model as follows:

- Full period: From the Qualifying Industrials Zones (1996) to (2010).
- First period: from the Qualifying Industrials Zones (1996) to FTA (2001).
- Second period: From the Qualifying Industrials Zones (1996) to the GFC (2008).
- Third period: From the Free Trade Agreement (2001) to the GFC (2008).

**Table 5.1: Results of Normality Tests**

<b>Entire Study Period from 1996 to 2010</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	2.8010	2.4990	1.0650	-1.7410	-0.4650	8.5160	1.3980	0.8740	0.2370
<b>Kurtosis</b>	12.6310	7.8510	3.8220	4.9200	2.1790	82.2300	5.1080	2.4000	1.6790
<b>Jarque-Bera</b>	931.17***	363.92***	39.154***	118.640***	11.564***	49256.3***	92.005***	25.6547***	14.762***
<b>First Sub-period from 1996 to 2001</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	2.9205	4.5690	1.6330	0.1470	-0.3050	8.0520	0.2000	-0.6570	-0.3370
<b>Kurtosis</b>	10.5300	21.9390	4.9510	1.7540	1.5930	67.1850	1.6460	2.6260	1.9110
<b>Jarque-Bera</b>	272.47***	1326.72***	43.435***	4.917***	7.05944***	13137.1***	5.980***	5.605***	4.923***
<b>Second Sub-period from 1996 to 2008</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	2.8860	2.2480	-3.3520	0.6910	-0.5200	7.9700	2.1310	1.3050	0.0180
<b>Kurtosis</b>	12.5050	6.6010	17.9950	2.9550	2.0760	71.8430	8.1110	4.1280	1.5470
<b>Jarque-Bera</b>	803.91***	215.754***	1753.83***	12.443***	12.586***	2457.9***	287.937***	52.557***	13.73***
<b>Third Sub-period from 2001 to 2008</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	2.0380	1.2560	-0.1780	-3.1880	-0.6350	7.9930	1.4650	1.0110	0.3160
<b>Kurtosis</b>	7.2830	2.9740	1.0990	13.5130	2.1759	69.9320	5.4580	3.0420	2.3240
<b>Jarque-Bera</b>	122.36***	22.106***	13.090***	529.229***	8.022***	16574.3***	51.206***	14.322***	3.0020

\*\*\* Represents the rejection of the null hypothesis of the normality test at 1%, FDI represents inward foreign direct investment, inward FII represents foreign indirect investment, FR represent financial risks, ER represents economic risk rate, PR represents political risks, OP represents trade openness, IS represents stock market price, INF represents inflation rate and INT represents interest rate.

The normality distribution is considered one of OLS assumptions. The normality test is applied to identify whether the error terms are normally distributed. The null hypothesis of the normality test is that the error terms are a normal distribution, against the alternative hypothesis stating that the error terms are not a normal distribution. Table 5.1 shows that the Jarque-Bera test statistic supports rejection of normality for all variables at the 1% significance level, except for interest rate in the third sub-period. The non-normality distributed data for each period may indicate problems of heteroskedasticity and auto-correlation, due to the time-dependence in the conditional variance.

### 5.2.1 Analysis of ARCH for Inward FDI Time Series in Jordan over all Study Periods

This section presents the empirical results of the inward FDI unlagged model over the three structural break periods and its diagnostic test including Durbin-Watson, LM test for serial correlation and autoregressive conditional heteroskedasticity (ARCH). The ARCH model introduced by Engle (1982) is specifically designed to model and forecast conditional variances. The variance of the dependent variable is modelled as a function of past values of the dependent variable and independent or exogenous variables. In particular ARCH models assume the variance of the current error term to be a function of the actual sizes of the previous time periods' error terms; often the variance is related to the squares of the previous error term (Brooks, 2006). Table 5.2 presents the results of ARCH, GARCH in mean and variance equations as well as their diagnostic tests.

**Table 5.2: ARCH Results of Determining Inward FDI in Jordan over Full Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	7.3584	0.0839	0.3090	0.0052
Log D(ER)	51.4321***	3.0911***	57.4114**	2.4295**
Log D(PR)	9.3121	0.1073	33.8905	0.7696
Log D(OP)	0.1997**	2.3691**	0.1869**	2.1382**
Log D(IS)	0.0989	1.0770	0.0729	0.9787
Log D(INF)	-13.3274*	-1.8770*	-83.5539***	-2.7136***
Log D(INT)	-84.4461***	-3.2517***	-40.4008*	-1.7236*
<b>Diagnostic Tests</b>	ARCH(-1) (0.4152)**	GARCH(-1) (0.1609)**	Adjusted R-square (0.5200)	LM test *R-square (0.2200)

Akaike criterion (14.4958), Schwarz criterion (14.8341), Obs\*R-squared (2.1729), F-Statistic (3.5205), \*\*\* DW (2.8275).  
\*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test indicates over the full period that there is no serial correlation among the error term and its lags at value of (2.8275), the LM test for serial correlation at value of (0.2206) also confirms that there is no serial correlation. The total value of error terms of ARCH and GARCH in the mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (full period):** Economic health appeared to be significant at a 5% level; financial and political risk rate are found to be insignificant. Trade openness appears to have a positive relationship with FDI and significant effect at 5% level. The stock market price is found to be insignificant although positive. Jordan's macroeconomic environment (inflation and interest rate) is found to be statistically significant at levels of 1% and 10% respectively.

**Evidence from the ARCH model in the variance equation (full period):** Financial health and political stability are not found to be statistically significant. However, Jordan's economic health, as expected, significantly positive at a 5% level. Trade openness appears to have a positive relationship with the flow of inward FDI into Jordan (5% level), but the Jordanian stock market price has an insignificant positive. The Jordanian inflation rate is found to be significantly negative at 1% and interest rate is found to have a significant negative relationship with inward FDI at 10%. The results of the first structural break time are reported in Table 5.3.

**Table 5.3: ARCH Results of Determining Inward FDI in Jordan First Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	19.8200	0.9433	44.0931	5.8658***
Log D(ER)	37.8462***	2.6304***	19.2048	3.6904***
Log D(PR)	0.6524	0.0399	7.4822	4.2816***
Log D(OP)	0.0046	0.1299	0.0137	0.5083
Log D(IS)	3.9779	1.3912	0.3011	0.3562
Log D(INF)	-6.9867	-0.4010	-10.1466	-2.3318**
Log D(INT)	-61.5515	-1.2960	-5.6625	-0.6366
<b>Diagnostic Tests</b>	ARCH (-1) (0.3401)**	GARCH(-1) (-0.1986)**	Adjusted R-square (0.4500)	LM test *R-square (0.2200)

Akaike criterion (12.06449), Schwarz criterion (12.67000) Obs\*R-squared (0.086115) F-Statistic (1.825215)\*, DW (2.8580), \*\*\* indicates statistical significance at 1%. \*\*, indicates statistical significance at 5%.

The DW test indicates over the first period that there is no serial correlation among variables at value of (2.8580). The LM test for serial correlation at value of (0.2200) also confirms that there is no serial correlation. The total error terms of ARCH and

GARCH in the mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (first period):** Jordan's economic health appears to have significant positive relationship with inward FDI at 5%, but financial health and political stability are found to be insignificant. Trade openness stock market price do not have significant positive relationship with inward FDI. Further, Jordan's macro-economic environment (inflation and interest rate) is not found to be significant.

**Evidence from the ARCH model in the variance equation (first period):** Financial health, economic health and political stability are found to have significant positive relationship with inward FDI at 1%. However, Trade openness stock market price appear to have insignificant positive relationships with inward FDI. The Jordanian inflation rate is found to have significantly negative relationship with inward FDI at 5%, but interest rate is not found to be significantly negative. Results of the second structural break time are reported in Table 5.4.

**Table 5.4: ARCH Results of Determining Inward FDI in Jordan Second Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	26.2800	0.1832	24.6021	0.3580
Log D(ER)	67.9874*	1.8773*	69.9670***	2.6445***
Log D(PR)	15.4700	0.1356	20.4895	0.4306
Log D(OP)	0.1662	0.9866	0.1423**	1.9908**
Log D(IS)	0.1279*	1.7369*	0.0786	0.9651
Log D(INF)	-73.5432**	-2.2344**	-78.7841**	-2.3375**
Log D(INT)	-15.3993	-0.5347	-14.1664	-0.9850
<b>Diagnostic Tests</b>	ARCH (-1) (0.341395)*	GARCH(-1) (-0.081856)	Adjusted R-square (0.4900)	LM test *R-square (0.3700)

Akaike criterion (14.74306), Schwarz criterion (15.09649) Obs\*R-squared (2.4541), F-Statistic (3.236852)\*\*\*, D.W (2.8130). \*\*\*, indicates statistical significance at 1%. \*\*, indicates statistical significance at 5%. \* indicate statistical significant at 10%.

The DW test indicates there is no serial correlation among the error term and its lags over the second period at value of (2.8130), as does the LM test for (0.3700). The

total error terms of ARCH and GARCH in variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (second period):**

Economic health is found to be statistically significant and positive in determining inward FDI at 10% per cent level, but financial health and political stability are found to be insignificant. Further, trade openness is not found to be significant, but stock market price appears to have a statistically significant positive relationship with inward FDI at 5% level. Inflation rate appears to have a negatively significant at 5%. However, the interest rate is not found to be significant.

**Evidence from the ARCH model in the variance equation (second period):**

Economic health has positive and statistically significant relationship with inward FDI at 1% level. However, financial health and political stability are not found to be significant. Trade openness is found to be significant at 5% level, whereas stock market price is not found to be significant. Inflation rate is found to be statistically significant at 5%, but the interest rate is not found to be significant. The results of the third structural break time are reported in Table 5.5.

**Table 5.5: ARCH Results of Determining Inward FDI in Jordan Third Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	2.3921	4.9306	13.3712	0.6532
Log D(ER)	3.0081	2.7705	95.1549*	1.7786*
Log D(PR)	0.5604	4.6506	99.3098	0.8368
Log D(OP)	-88.6242	-0.4170	0.21618*	1.8264*
Log D(IS)	11.3113	0.5726	0.0649	0.5807
Log D(INF)	-31.9611	-0.00065	-10.7096*	-1.9032*
Log D(INT)	-3.3458	-8.1606	-25.2234	-0.5775
<b>Diagnostic Tests</b>	ARCH (-1) (0.2940)	GARCH(-1) (-0.1477)	Adjusted R-square (0.4700)	LM test *R-square (0.2300)

Akaike criterion (14.3956), Schwarz criterion (14.9493) Obs\*R-squared (0.1761), F-Statistic (2.274046), D.W (2.7885), \*\* indicate statistical significant at 10%

The DW statistic (2.7885) indicates over the third period there is no serial correlation among the variables. Also, the LM test for serial correlation confirms there is no

serial correlation at value of (0.2300). The total error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the variance equation (third period):**

Financial health, economic health and political stability are found to have insignificant positive signs of effect. Further, trade openness and stock market are not found to be significant. The macroeconomic factors appear to have insignificant negative relationship with inward FDI.

**Evidence from the ARCH model in the variance equation (third period):**

Financial health and political stability are not found to be significant, while economic health appears to be positively significant at 1% level. Trade openness is found to be significant at 10% level, while stock market price appears to be insignificant. Inflation rate is found to be statistically significant at 10% level, but the interest rate is found to be insignificant.

**5.2.2 Analysis of Structural Break for Inward FII Time Series in Jordan**

This section presents the empirical results of the unlagged model of inward FII over the four structural breaks period and its diagnostic testing including Durbin-Watson, LM test for serial correlation and autoregressive conditional heteroskedasticity (ARCH). The results of determining inward FII for the full period are reported in Table 5.6.

**Table 5.6: ARCH Results of Determining Inward FII in Jordan Full Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	4.2942	9.2305	6.8307	0.1724
Log D(ER)	20.6586	0.0025	21.5633	0.7951
Log D(PR)	11.1042	0.0009	44.9045**	2.0710**
Log D(OP)	7.2992	0.0583	-0.0058	-0.0859
Log D(IS)	16.3554	0.0079	10.9393*	2.0297*
Log D(INF)	-1.2506	-0.0115	-45.7451***	-2.8466**
Log D(INT)	-1.8142	-4.3005	-13.4490	-0.1502
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0243)	GARCH(-1) (-0.1092)	Adjusted R-square (0.3900)	LM test *R-square (0.4600)

Akaike info criterion (12.2053), Schwarz criterion (12.4071) Obs\*R-squared (34.0552). F-Statistic (1.8103)\*, D.W (1.9500).  
 \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test indicates over the full period that there is no serial correlation among the error term and its lags at value of (1.9500); the LM test for serial correlation (0.5300) also confirms there is no serial correlation. The total error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (full period):** The financial health and economic health are not found to be significant, but political stability appears to have a significant positive relationship with inward FII at 5% level. Stock market price and trade openness appear to have a significant positive at 5% level relationship with inward FII. Inflation rate is not found to be statistically significant, but interest rate is found to be negatively significant at 5% level.

**Evidence from the ARCH model in the variance equation (full period):** political stability is found to be positively significant at 5% level, but the financial health and economic health are not found to be significantly positive. Trade openness is not found to be significant. Stock market price appears to have a significant positive at 1% level relationship with inward FII. Inflation rate and interest rate are found to be negatively significant, at 1% and 10% levels. The results of the first structural break time for determining inward FII are presented in Table 5.7.

**Table 5.7: ARCH Results of Determining Inward FII in Jordan First Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	69.1574	0.0273	69.8962	0.1343
Log D(ER)	25.5740	0.0162	23.0483	0.1094
Log D(PR)	16.0888*	1.8247*	79.3134**	2.1013**
Log D(OP)	5.9755**	2.2303**	0.4609	0.7524
Log D(IS)	5.9771**	2.5701**	3.4237***	5.0295***
Log D(INF)	-10.7766	-0.0290	-1.2369***	-8.5727***
Log D(INT)	-9.1981**	-2.1644**	-2.1844*	-1.7307*
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0114)	GARCH(-1) (0.5836)	Adjusted R-square (0.5800)	LM test *R-square (0.5300)

Akaike info criterion (13.3063), Schwarz criterion (13.5021) Obs\*R-squared (35.0442). F-Statistic (1.780732)\*, D.W (1.85). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW statistic (1.8500) indicates over the first period that there is no serial correlation among the variables, as does LM test for (0.4600). The total error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (first period):** financial health, economic health and political stability are not found to be significant. Trade openness and stock market price are found to be insignificant. Inflation rate and interest rate are found to be statistically insignificant.

**Evidence from the ARCH model in the variance equation (first period):** Jordanian financial health and economic health are found to be insignificant, but political stability is found to be positively significant at 5%. Trade openness is found to be negative insignificant, but stock market price is found to be positively significant at 10%. Inflation is found to have a significant positive relationship with inward FII, but interest rate is found to be insignificant. The results of the second structural break for determining inward FII are shown in Table 5.8.

**Table 5.8: ARCH Results of Determining Inward FII in Jordan Second Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	59.950	0.019613	60.0826	0.0946
Log D(ER)	2.7097	0.001134	1.8542	0.0075
Log D(PR)	22.3888***	4.178987***	80.5778*	1.8325*
Log D(OP)	-0.3262	-0.133543	-0.4586	-0.6941
Log D(IS)	3.8121***	5.551266***	5.2063***	4.0630***
Log D(INF)	-11.9996***	-6.86879***	-32.5041	-0.1043
Log D(INT)	-2.2695	-0.421893	-22.6798*	-1.7425*
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0132)	GARCH(-1) (0.5839)	Adjusted R-square (0.4400)	LM test *R-square (0.4300)

Akaike info criterion (14.4527), Schwarz criterion (14.6687) Obs\*R-squared (30.60169). F-Statistic (1.7954)\*, DW (1.9600). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%.\* indicate statistical significant at 10%.

The DW statistic (1.9600) indicates over the second period that there is no serial correlation among the terms and its lags, as does LM test for (0.4300). The total error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (second period):**

Financial health and economic health are found to be insignificant, but political stability appears to have a significant positive relationship with inward FII at 1% level. Trade openness is found to be insignificant, while the stock market price appears to be significant positive at 1% level. Inflation rate is found to be negatively significant at 1%, but the interest rate is found to be insignificant.

**Evidence from the ARCH model in the variance equation (second period):**

financial health and economic health are found to be insignificant, but political stability is found to be statistically significant at 5% level. Trade openness is found to be insignificant, while the stock market price is found to have a significant positive relationship with inward FII at 1% level. Inflation rate is found to be insignificant, but the interest rate has significant negative relationship with inward at 10%. The results of the third structural break time for determining inward FII are reported in Table 5.9.

**Table 5.9: ARCH Results of Determining Inward FII in Jordan Third Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	20.6204	0.0262	20.6204	0.8920
Log D(ER)	22.2935***	3.6746***	31.6173	0.6511
Log D(PR)	23.7076	1.4412	23.6902**	2.1994**
Log D(OP)	-5.9755**	-2.2303**	-3.8363*	-1.7762*
Log D(IS)	6.9771***	6.9771***	0.58124	0.5725
Log D(INF)	-27.6235	-0.1661	-27.6389	-0.5411
Log D(INT)	-96.7781	-0.8196	-96.7749**	-2.4411**
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0234)	GARCH(-1) (-0.0134)	Adjusted R-square (0.4200)	LM test *R-square (0.2500)

Akaike info criterion (14.4527), Schwarz criterion (14.6687) Obs\*R-squared (30.6016). F-Statistic (1.9055)\*, DW (2.0800).  
 \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW statistic (2.0800) indicates over the third period that there is no serial correlation among the variables; the LM test for serial correlation (0.2500) also confirms that there is no serial correlation. The total error terms of ARCH and GARCH in mean variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (third period):** financial health and political stability are not found to be significant, while the economic health appears to be a positive and significant at 1%. Trade openness is found to be a negative and significant at %5. Stock market price appears to be significant at 1% level. Inflation rate and interest rate are found to be statistically insignificant.

**Evidence from the ARCH model in the variance equation (third period):** The financial health and economic health appear to be insignificant, but Jordanian political stability appears to have a significant positive relationship with inward FII at 5% level. Trade openness is found to have a significant negative sign at 10% level. Stock market price appears to be insignificant. Inflation rate is found to be insignificant, but the interest rate has significant negative relationship with inward at 5%.

### **5.3 Analysis of Structural Break of Inward FDI and FII Time Series in Australia**

The diagnostic tests for structural breaks for Australia are reported in the data section of the previous Chapter and the study periods are identified for both Jordan and Australia. This section discusses the empirical results of determining inward FDI and FII in Jordan based on the full period of study and three structural breaks in the Australia times series data based on ARCH model as follows:

- Full period: From (1996) to (2010).
- First period: From (1996) to FTA with U.S (2005).
- Second period: From (1996) to the GFC (2008).
- Third period: From the FTA with U.S (2005) to the GFC (2010).

The normality distribution is considered one of the OLS assumptions. The normality test is applied to identify whether the monthly data are normally distributed. The null hypothesis of the normality test is that the data are a normal distribution against the alternative hypothesis stating that the data are not a normal distribution.

**Table 5.10: Results of Normality Tests**

<b>Entire Study Period from 1996 to 2010</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	-1.693	0.044	1.053	-1.440	-1.139	0.651	0.906	0.390	-0.480
<b>Kurtosis</b>	18.988	4.308	4.518	4.801	4.491	4.649	3.315	3.670	3.863
<b>Jarque-Bera</b>	200.17***	12.907***	50.592***	86.543***	55.630***	33.143***	25.406***	7.962***	12.511***
<b>First Sub-period from 1996 to 2001</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	-2.848	0.589	1.436	-0.796	-1.099	0.143	0.609	0.597	1.080
<b>Kurtosis</b>	22.598	2.606	3.675	3.763	3.839	2.808	2.418	3.665	3.686
<b>Jarque-Bera</b>	208.95***	7.714***	43.549***	15.597***	27.718***	0.593	9.121***	9.359***	25.720***
<b>Second Sub-period from 1996 to 2008</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	-1.531	0.734	1.649	-0.985	-1.092	-0.041	0.961	0.490	0.977
<b>Kurtosis</b>	18.103	2.940	4.537	4.126	4.217	2.716	3.223	3.842	3.494
<b>Jarque-Bera</b>	142.89***	12.962***	79.511***	30.927***	37.529***	0.521	22.508***	10.032***	24.396***
<b>Third Sub-period from 2001 to 2008</b>									
<b>Jordanian</b>	<b>FDI</b>	<b>FII</b>	<b>FR</b>	<b>ER</b>	<b>PR</b>	<b>OP</b>	<b>IS</b>	<b>INF</b>	<b>INT</b>
<b>Skewness</b>	-2.290	-1.046	-1.013	-0.991	-0.667	1.044	-0.067	0.380	-0.602
<b>Kurtosis</b>	12.265	4.412	3.515	2.721	3.082	5.606	2.298	2.714	2.120
<b>Jarque-Bera</b>	320.53***	19.117***	13.122***	12.032***	5.369***	33.467***	1.531	1.980	6.673***

\*\*\*\* Represents the rejection of the null hypothesis of the normality test at 1%, FDI represents inward foreign direct investment, inward FII represents foreign indirect investment, FR represent financial risks, ER represents economic risk rate, PR represents political risk rate, OP represents trade openness, IS represents stock market price, INF represents inflation rate and INT represents interest rate.

Table 5.10 shows that the Jarque-Bera test statistic supports rejection of normality for all variables at the 1% significance level except for trade openness in the first and second sub-period and the stock market in the third sub-period. The non-normality distributed data for each period may indicate problems of heteroskedasticity and autocorrelation due to the time dependence in the conditional variance.

### 5.3.1 Analysis of Structural Break Inward FDI Time Series in Australia

This section presents empirical results of the inward FDI unlagged model over the three structural breaks period and the diagnostic tests including Durbin-Watson, LM test for serial correlation and autoregressive conditional heteroskedasticity (ARCH). The unlagged results are robust and the diagnostic tests satisfied. Table 5.11 presents the results of ARCH, GARCH in mean and variance equations as well their diagnostic tests.

**Table 5.11: ARCH Results of Determining Inward FDI in Australia Full Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	54.1228**	2.2541**	26.3413	0.4824
Log D(ER)	38.4296	0.0119	26.7979	0.4156
Log D(PR)	38.6379**	2.2123**	38.4206**	2.3260**
Log D(OP)	14.0016**	2.3059**	41.2106*	1.8920*
Log D(IS)	12.5160*	2.0802*	8.7994**	2.3139**
Log D(INF)	-17.4074	-0.0089	-32.2680	-0.2658
Log D(INT)	-48.9602	-0.0827	-26.1067*	-2.1246*
<b>Diagnostic Tests</b>	ARCH (-1) (0.0097)***	GARCH(-1) (-0.9900)***	Adjusted R-square (0.4800)	LM test *R-square (0.2900)

Akaike info criterion (13.2214), Schwarz criterion (13.4173), Heteroskedasticity White test: Obs\*R-squared (28.0800), F-Statistic (2.9377) \*\*\*, D.W Stat (1.9900). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test indicates over the full period that there is no serial correlation among the error term and its lags at value of (1.9900); the LM test for serial correlation (0.2900) also confirms there is no serial correlation. The total error terms of ARCH and GARCH in mean variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (full period):** Financial health and economic health are found to have significant positive relationship at 5%, but the political stability appears to be insignificant. Trade openness and stock market price are found to be significant at 5% and 10% levels. Australia's macro-economic factors are not found to be significant.

**Evidence from the ARCH model in the variance equation (full period):** The financial health and economic health are not found to be significant, but the political stability is found to have a significant and positive relationship with inward FDI at 5% level. Trade openness appears to have significant positive sign at 5% level. Stock market price appears to have a statistically significant positive sign at 10% level. Inflation rate is found to be significant, while interest rate is found to be significant at 10%. The results of the first structural break period are reported in Table 5.12.

**Table 5.12: ARCH Results of Determining Inward FDI in Australia First Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	37.4403**	2.3149**	34.3154	0.4685
Log D(ER)	14.0956	1.4095	61.3217**	2.3676**
Log D(PR)	34.1928***	3.3466***	24.9939	0.0335
Log D(OP)	63.8670	0.4571	63.8674	0.6178
Log D(IS)	16.2078***	3.7228***	15.6822*	1.8679*
Log D(INF)	-79.0117	-0.6249	-84.9968	-0.5888
Log D(INT)	-15.0189*	-2.0811*	-46.0146	-0.0906
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0107)***	GARCH(-1) (-0.3795)	Adjusted R-square (0.4300)	LM test *R-square (0.1230)

Akaike info criterion (14.6837), Schwarz criterion (14.9406) Heteroskedasticity White test: Obs\*R-squared (33.8962), F-Statistic (1.8886)\*, DW (2.0100). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW statistic (2.0100) indicates over the first period that there is no serial correlation among variables, along with LM test for serial correlation (0.1230) that also confirms that there is no serial correlation. The error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (first period):** Financial health and political stability are found to be significant at 5% and 1% levels, while the economic health appears to be insignificant. Trade openness is found to be insignificant, but stock market price appears to have a significant positive

relationship with inward FDI at 1% level. Inflation rate and interest rate are found to be statistically insignificant, interest rate is found to be negatively significant at 10%.

**Evidence from the ARCH model in the variance equation (first period):** economic health is found to be significant with positive relationship with inward FDI. However, financial health and political stability are not found to be significant. Trade openness is not found to be significant positive. Stock market price appear to have a statistically significant positive relationship with inward FDI at 10% level. Inflation rate and interest rate are not found to be significant. The results of the second period are reported in Table 5.13.

**Table 5.13: ARCH Results of Determining Inward FDI in Australia Second Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	28.0018	0.2074	20.7367	0.2812
Log D(ER)	21.2395	0.10368	65.2378*	1.7554*
Log D(PR)	20.2956	0.1129	27.1798	0.3575
Log D(OP)	35.6308***	3.2423***	31.0182*	1.7092*
Log D(IS)	13.4689***	3.0432***	7.6305*	1.7999*
Log D(INF)	-34.2444*	-1.9249*	-56.1709*	-1.9050*
Log D(INT)	-57.2868***	-2.9777***	-12.3679	-0.3596
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0138)***	GARCH(-1) (-0.1553)	Adjusted R-square (0.4600)	LM test *R-square (0.2000)

Akaike info criterion (15.9945), Schwarz criterion (16.2224), Heteroskedasticity White test: Obs\*R-squared (33.3833), F-Statistic (1.7652)\* DW (1.9900). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW statistic (1.9900) indicates over the second period that there is no serial correlation among the variables, as does LM test for (0.2000). The total error terms of ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (second period):** Financial health, economic health and political stability are not found to be significant. Trade openness and stock market price are found to be positively

significant at 1% level. Inflation rate and Interest rate are found to be negatively significant at 10% and 1% levels respectively.

**Evidence from the ARCH model in the variance equation (second period):**

Financial health and political stability are not found to be significant positive, economic health is found to be positively significant at 10% level. Trade openness and stock market price are found to have significant positive with inward FDI at 1% level. Inflation rate is found to be negatively significant at 10% level, but interest rate is not found to be significant. The results of the third structural break period are reported in Table 5.14.

**Table 5.14: ARCH Results of Determining Inward FDI in Australia Third Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	62.1877	0.0247	69.5545	0.2714
Log D(ER)	39.573	0.1417	14.7969*	1.8574*
Log D(PR)	80.6368	0.2287	25.9525	0.5750
Log D(OP)	-35.6280*	-1.7936*	-15.3350*	-1.7282*
Log D(IS)	29.1954*	2.1293*	25.3553*	1.7599*
Log D(INF)	-97.2030	-0.3302	-36.8948	-1.9050*
Log D(INT)	-76.8581*	-1.8629*	-87.1741	-0.3596
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0261)***	GARCH(-1) (-0.1242)	Adjusted R-square (0.3900)	LM test *R-square (0.1880)

Akaike info criterion (16.8593), Schwarz criterion (16.2099) Heteroskedasticity White test: Obs\*R-squared (36.4475), F-Statistic (1.737460)\*, DW (1.9670). \*\*\*, indicate statistical significant at 1%. \* indicate statistical significant at 10%.

The DW test indicates over the third period that there is no serial correlation among the error term and its lags (1.9670). Also, the LM test for serial correlation (0.1880) confirms there is no serial correlation. The total error terms of ARCH and GARCH in mean and variance equation is less than one each case. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (third period):**

Financial health and economic health political stability are not found to be significant. Trade openness is found to be negatively significant at 10% level. Stock market price found

to be positively significant at 10% level. Inflation rate is found to be statistically insignificant, but the interest rate is found to be statistically significant at 10% level.

**Evidence from the ARCH model in the variance equation (third period):**

Financial health and political stability are not found to be significant, but economic health is found to be positively significant at 10%. Trade openness is found to be negatively significant at 10% level. Stock market price is found to have significant positive relationship with inward FDI at 10% level. Inflation rate is found to be negatively significant at 10% level, but the interest rate is found to be insignificant.

**5.3.2 Analysis of Structural Break of Inward FII Time Series in Australia**

The results of D.W tests over the study period show that the values of the error terms are not serially independent. The White test results for the study periods indicate that a heteroskedasticity problem exists. The results of the entire period in determining inward FII are reported in Table 5.15.

**Table 5.15: ARCH Results of Determining Inward FII in Australia Full Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	21.9081	0.3427	27.7457	0.0448
Log D(ER)	13.1806*	2.0822*	39.5462	0.0541
Log D(PR)	12.8251	0.1757	79.7665*	1.8930*
Log D(OP)	-29.7712***	-3.8413***	-29.7748**	-3.1402**
Log D(IS)	23.7042***	3.9109***	7.5114*	1.7584*
Log D(INF)	-14.2830*	-1.8219*	-16.2034*	-1.7789*
Log D(INT)	-50.9480**	-2.6689**	-50.9131**	-2.7596**
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0194)***	GARCH(-1) (-0.0248)	Adjusted R-square (0.4100)	LM test *R-square (0.1630)

Akaike info criterion (14.5418), Schwarz criterion (15.7377), Heteroskedasticity White test: Obs\*R-squared (0.6003), F-Statistic (10.54292) \*\*\*, D.W (2.0300). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test value (2.030) indicates over the full period that there is no serial correlation among the error terms and its lags. Also, the LM test for serial correlation (0.1630) confirms there is no serial correlation. The total error terms of residual

ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (full period):** Financial and political stability are found to be insignificant, but economic appears to have a positive with inward FII and significant at 10% level. Trade openness is found to be negatively significant at 1% level. Stock market price appears to be a significantly positive at 1% level. Inflation rate is found to be negatively significant at 10% level and the interest rate is found to be significantly negative sign at 5% level.

**Evidence from the ARCH model in the variance equation (full period):** Financial health and economic health are found to be statistically insignificant, but the economic health is found to be significantly positive at 10% level. Trade openness is found to be significantly negative at 5% level. Stock market price is found to be significantly positive at 1% level. Inflation rate and interest rate are found to be negatively significant at 10% and 5% levels respectively. The results of the first structural break for determining inward FII are reported in Table 5.16.

**Table 5.16: ARCH Results of Determining Inward FII in Australia First Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	20.3137	0.3192	44.0109	1.2058
Log D(ER)	10.1174*	1.8053*	12.7764**	2.3265**
Log D(PR)	75.7972*	1.8311*	71.4990*	1.8019*
Log D(OP)	-28.2997***	-2.8589***	-28.3800***	-2.8860***
Log D(IS)	0.1129	0.0140	2.8150	0.2606
Log D(INF)	-12.4794***	-2.8325***	-86.8361	-1.0065
Log D(INT)	-77.3474	-0.1424	-30.9412*	-1.9432*
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0485)***	GARCH(-1) (0.0361)	Adjusted R-square (0.40200)	LM test *R-square (0.6590)

Akaike info criterion (15.4211), Schwarz criterion (16.5089) Heteroskedasticity White test: Obs\*R-squared (48.6041), F-Statistic (4.0611) \*\*\*, WD (2.0280). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test value (2.0280) indicates that there is no serial correlation among the variables. Also, LM test for serial correlation (0.6590) confirms there is no serial

correlation. The total error terms of residual ARCH and GARCH in mean variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (first period):** Financial health appears to be insignificant, while economic health and political stability are found to be significantly positive at 10% levels. Trade openness is found to be significantly negative at 1% level, while the stock market price is found to be insignificant. Inflation rate is found to be statistically significant at 1% level, but the interest rate is found to be insignificant.

**Evidence from the ARCH model in the variance equation (first period):** Australian financial health is found to be insignificant, but the economic health and political stability are found to be positively significant at 5% and 10% level respectively. Trade openness appears to be negatively significant at 1% level. Stock market price is found to be insignificant. Inflation rate is found to be insignificant, but the interest rate is found to be negatively significant at 10% level. The results of the second period for determining inward FII are reported in Table 5.17.

**Table 5.17: ARCH Results of Determining Inward FII in Australia Second Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	13.5053	0.2761	41.1869	0.8816
Log D(ER)	15.3866**	2.4243**	20.9856***	3.3830***
Log D(PR)	27.6446	0.5379	20.0004	0.4152
Log D(OP)	-20.0277	-1.6491	-26.6636**	-2.3008**
Log D(IS)	27.0211***	3.9258***	18.5069***	4.0219***
Log D(INF)	-18.5539**	-3.1770**	-20.6995**	-2.4656**
Log D(INT)	-16.6347	-0.8251	-20.4057	-0.9366
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0575)***	GARCH(-1) (0.0992)	Adjusted R-square (0.5200)	LM test *R-square (0.3180)

Akaike info criterion (16.6664), Schwarz criterion (17.8943), Heteroskedasticity White test: Obs\*R-squared (41.0482), F-Statistic (6.8383) \*\*\*, D.W (2.0740). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test value (2.0740) shows over the second period that there is no serial correlation among the variables. Also, LM test for serial correlation (0.3180)

confirms there is no serial correlation. The total error terms of residual ARCH and GARCH in mean and variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (second period):**

Financial health and political stability are found to have insignificant positive sign, but economic health appears to be positively significant at 5% level. Trade openness is found to be insignificant. Stock market price appears to have a significant positive relationship with inward FII at 1% level. Inflation rate is found to be statistically significant at 5% level, but the interest rate is found to be insignificant.

**Evidence from the ARCH model in the variance equation (second period):**

Financial health and political stability are found to have insignificant positive sign, while economic health appears to be positively significant at 1% level. Trade openness is found to be negatively significant at 5%. Stock market price is found to be positively significant at 1% level. Inflation rate is found to be negatively significant at 5% level, but the interest rate appears to be insignificant. The results of the third period for determining inward FII are reported in Table 5.18.

**Table 5.18: ARCH Results of Determining Inward FII in Australia Third Period**

Independent Variable	Coefficient (Mean)	z-Statistic (Mean)	Coefficient (Variance)	z-Statistic (Variance)
Log D(FR)	15.9896	1.0416	74.7199*	1.7470*
Log D(ER)	17.8830**	2.6156**	12.1091	0.4643
Log D(PR)	20.6780	0.8811	20.6205	0.6321
Log D(OP)	-97.299 ***	-3.9591***	-97.2951***	-4.0215***
Log D(IS)	13.3771***	3.7866***	15.3436***	3.3445***
Log D(INF)	-39.4199*	-2.2600*	-21.1402	-0.7181
Log D(INT)	-21.11694	-0.5398	-55.6430	-0.8961
<b>Diagnostic Tests</b>	ARCH (-1) (-0.0782)	GARCH(-1) (0.4527)	Adjusted R-square (0.6000)	LM test *R-square (1.14100)

Akaike info criterion (17.5915), Schwarz criterion (18.9420) Heteroskedasticity White test: Obs\*R-squared (62.1205,) F-Statistic (2.6682) \*\*, DW (2.2120). \*\*\*, indicate statistical significant at 1%. \*\*, indicate statistical significant at 5%. \* indicate statistical significant at 10%.

The DW test value (2.2100) indicates over the third period that there is no serial correlation among the variables. The LM test for serial correlation (1.1410) also confirms there is no serial correlation. The total error terms of residual ARCH and GARCH in mean variance equations are less than one. Therefore, the model is considered stable.

**Evidence from the ARCH model in the mean equation (third period):** Financial health and political stability are found to be insignificant, while the economic stability appears to be positively significant at 5% level. Trade openness is found to be negatively significant at 1% level. Stock market price appears to have a positive relationship with inward FII and significant at 1% level. Inflation rate is found to be negatively significant sign of effect at 10% level, but interest rate is found to be statistically insignificant.

**Evidence from the ARCH model in the variance equation (third period):** Financial health is found to be positively significant at 10%, while the economic stability and political stability appear to be insignificant. Trade openness is found to be negatively significant at 1% level. Stock market price appears to be positively significant at 1% level. Australia's macro-economic factors appear to be insignificant.

#### **5.4 Comparison of determining Foreign Investment findings in Jordan and Australia**

This Chapter presents the results of structural breaks time series of inward FDI and FII inflows into Jordan and Australia. In the case of Jordan, the results of the structural breaks time series show that economic health, stock market price and inflation rate mainly have a significant relationship with the inflows of FDI into Jordan. Further, the results show that political stability, stock market price, interest rate and inflation rate have a significant impact on the inflows of FII into Jordan.

In the case of Australia, the results of structural breaks time series imply that economic risk rate, trade openness, stock market price and inflation have a significant influence on the inflows of FDI into the Australian economy. The results also indicate that economic health, political stability trade openness, stock market price, inflation rate and interest rate have a significant influence on the inflows of FII

into the Australian economy. The next Chapter reports the main findings and draws a clearer picture of the variables' behaviour when the lags are introduced into the model.

## 5.5. Discussion of the Unlagged Models Findings

One of this study's goals is to explore data for the contemporaneous relationship between foreign investment (FDI and FII), country factors (financial and economic health and political stability), degree of liberalisation (trade openness), stock market price and the macroeconomic environment (inflation and interest rate), draw from Jordanian and Australian data over three study periods. Autoregressive Conditional Heteroskedasticity (ARCH) model is applied to examine the specified variables in the contemporaneous system. The findings of unlagged models are discussed in relation to support, or otherwise for the hypotheses and support or otherwise for underlying theory and previous research. This section now presents evidence to demonstrate the uniqueness of the study and how it adds to the body of knowledge in terms of the contemporaneous relationships. The main findings of the lagged dynamic models will be reported in Chapter Six.

### 5.5.1 Determining Inward FDI into Jordan and Australia in Contemporaneous Context

This section discusses the empirical results of the unlagged model (ARCH) in determining inward FD in Jordan and Australia based on the full period and three structural breaks in the Jordanian and Australian time series data. Table 5.19 presents the results of the specified ARCH model in relation to the hypotheses over the study periods.

**Table 5.19: Determining Inward FDI in Jordan and Australia over Study Period**

Jordan (FDI)	96-10	96-01	96-08	01-08	Australia (FDI)	96-10	96-05	96-08	05-08
FR	+	+1%	+	+	FR	+	+	+	+
ER	+ 1%	+ 1%	+ 1%	+10%	ER	+	+ 5%	+ 10%	+ 10 %
PR	+	+1%	+	+	PR	+ 5%	+	+	+
OP	+	+	+	+10%	OP	+ 10%	+	+ 10%	- 10 %
IS	+ 5%	+	+ 5%	+	IS	+ 5%	+ 10%	+ 10%	+ 10 %
INF	- 1%	-5%	- 5%	-10%	INF	-	-	- 10 %	- 10 %
INT	- 10%	-	-	-	INT	-10%	-	-	-

Note: \*\*\*, \*\*and \* indicate statistical significant at 1%, 5% and 10% respectively, - : represent negative relationship and rejection of the alternative hypothesis, +: represents positive relationship and rejection of the alternative hypothesis.

### **5.5.1.1 Discussion of inward FDI in Jordan and Australia and their Country Factors.**

This Sub-section discusses whether or not Jordan and Australia country factors include financial and economic health and political stability have contemporaneous relationships with inward FDI in those countries as follows:

**H<sub>1a</sub>: There is a relationship between financial health and FDI in Jordan over the study periods.**

**H<sub>1d</sub>: There is a relationship between financial health and FDI in Australia over the study periods.**

In the case of Jordan, the results of ARCH model show that acceptance of the hypothesis (H<sub>1a</sub>) of financial health with 1% level of significance, over the first structural study periods. Further, the coefficient of financial health shows the predicated positive relationship with the inflows of inward FDI into Jordan economy during each the study periods. This indicates that Jordan enjoyed a high financial health, which includes a stable exchange rate and interest rate system. Thus, the Jordan's financial health has created an attractive environment destination for foreign investment.

In the case of Australia, the ARCH model shows the rejection of the alternative hypothesis (H<sub>1d</sub>) of financial health over the study periods. However, the coefficient of financial health has the predicated positive relationship with inflows of inward FDI in Australia's economy during each study period. According to ICRG, high financial risk rates reflect high financial health. Financial health covers the stability of exchange rates, interest rates, external debt and current account. Australia's strong and stable financial system and well-managed companies make it a highly attractive location for foreign investment. In 2011, Australia received over \$2 trillion as total stock of foreign investment (Mishra 2013).

The acceptance of the alternative hypothesis in terms of the predicated theoretical sign supports by previous studies related to the financial health of a foreign country. Many studies (For example, Cushman 1985; Goldberg 1993; Farrell et al. 2000; Pan 2003 and Mencinger 2003) indicate that the decision of inward FDI is related to the financial health, for example. These studies are helpful in explaining the

contemporaneous relationships between inward FDI and foreign country's financial health.

Cushman (1985) finds a positive relationship between depreciating host-country currency, or appreciating home-country currency and a home-country's outward FDI. Goldberg (1993) finds that weaker currency in host countries discouraged FDI from other countries. Farrell et al. (2000) review the annual data of manufacturing industries in 16 countries for the period 1984-1995 in order to identify the determinants of Japanese FDI. Farrell et al. (2000) report that interest rate risk is negative and significantly determines Japanese FDI; that is, an unhealthy financial system negatively affects Japanese FDI. Pan (2003) maintains that firms in countries with low interest rates enjoy a cost advantage that enables them to raise more capital with a lower burden of interest payment.

**H<sub>2a</sub>: There is a relationship between economic health and FDI in Jordan over the study periods.**

**H<sub>2c</sub>: There is a relationship between economic health and FDI in Australia over the study periods.**

The ARCH model supports the alternative hypothesis (H<sub>2a</sub>). Jordan's economic health significantly determines the behaviour of inward FDI into that country, at 1% level over the full, first, second periods and during the third period at 10% level. The coefficient of the Jordan's economic health has the predicated positive relationship with the inward FDI in Jordan during each study period.

Jordan has enhanced its business and macroeconomic environments, thereby leading to significant flows of investment from foreign sources, which averaged some 27 per cent of GDP in the period 2000-2008. Jordan has a network of agencies that work to invite and attract investments into the country. In particular, these agencies propose a variety of motivations and exemptions for different businesses based on the country's region and the applicability of the given investment.

In the case of Australia, the ARCH model results reveal rejection of the alternative hypothesis over the full period. However, the alternative hypothesis (H<sub>2c</sub>) is accepted over the three structural breaks. That is, Australia's economic health is significant in determining the behaviour of inward FDI in Australia over the study periods.

Further, the coefficient of the Australian economic health has the expected positive relationship with the inward FDI in Australian during each study period.

According to ICRG, high economic risk in a host country indicates a stable and healthy economy. In other words, the economic risk rate of a foreign country negatively affects inward FDI. The economic health of a foreign country includes real gross domestic product (GDP), growth, annual inflation rate, and gross national product per head. Relatively, Jordan's economy has a reasonable GDP per head and low inflation rate. In contrast, the Australian economy has high GDP per head and low inflation rate, which make it an attractive destination for foreign investors. The result of the ARCH model is largely consistent with the findings of Rammal and Zurbruegg (2006), Blonigen et al. (2007), Hasen and Giorgioni (2007), and Azam (2010).

This is supported by the findings of Blonigen et al. (2007) who conduct a general examination of spatial interactions in empirical FDI models drawn from US outbound FDI activity data. Blonigen et al. (2007) emphasise that a host country's GDP has a positive effect on foreign investment and is statistically significant. Further, these researchers conclude that GDP and surrounding market potential have identical effects on FDI activity. Azam (2010) examines the impact of different economic determinants on FDI for Armenia, Kyrgyz Republic and Turkmenistan. The researcher analysed secondary data from 1991 to 2009 through a simple econometric model (log least squares technique). The result shows a positive relationship between FDI and GDP in the host economy.

**H<sub>3a</sub>: There is a relationship between Political stability and FDI in Jordan over the study periods.**

**H<sub>3c</sub>: There is a relationship between Political stability and FDI in Australia over the study periods.**

Evidence from the ARCH model supports the acceptant of the hypothesis that political stability related positively and significantly to inward FDI in Jordan over the first structure break. The political stability of a foreign country includes: government stability, government quality, rules of law and adequate, protection of property rights, voice and accountability government, transparency and legislation. According to ICRG, the high political risk rate reflects lower political risk rate and a

stable political environment. Although Jordan has fairly strong political stability (for example protection of property rights, voice and accountable government, low corruption, transparency and legislation), it is surrounded by geographically unstable regimes. This means that Jordan has to work hard to attract foreign investment. Thus, high political stability is associated with high flows of inward FDI in the Jordan economy.

Evidence of the ARCH model indicated that Australian political stability is significant at 5% over the full study period and positive relationship with the movements of inward FDI in Australia. The strength of Australia's investment positions and attractiveness for foreign investment are highlighted in recent years by its political stability, low level of corruption, government accountability, protection of property rights, transparency and legislation.

The support of the alternative hypothesis ( $H_3$ ) in terms of the expected theoretical sign is reflected in several review studies (For example, Guy, 2000; Roll & Talbott, 2001; Ursprung 2002; Globerman & Shapiro 2003; Rui 2003, Shapiro 2003; Jansen & Stokman 2004; Busse 2004; Acemoglu et al 2005a, Li & Filer 2007).

The FDI is responsive to a country's political conditions, which means that the country that has institutional systems and prudential laws and regulations for the purpose of protecting the property and civil rights of an investor can be more effective at attracting FDI (Guy, 2000 and Roll & Talbott, 2001). Multinational enterprises and foreign investors have explored many theoretical and empirical studies dealing with the factors that influence decisions and location choices for investment abroad. Some factors represented in the literature are firm-level characteristics while others are country-level characteristics, which in turn can be either host country characteristics or home country characteristics. For example, Harms and Ursprung (2002), Jansen and Stokman (2004), Globerman and Shapiro (2003), Rui (2003), Shapiro (2003), Busse (2004), Acemoglu et al (2005), Li and Filer (2007) find that MNFs are more likely to be attracted to a democracy. Therefore, the quality of Jordan and Australian government is closely related to its level of inward FDI. Further, the higher political rights and level of democracy attract more inward FDI.

### **5.5.1.2 Impact of Trade Openness and Stock Market price on Inward FDI.**

The findings of ARCH model in relation to whether not support the positive impact of trade openness policy and stock market price on the flows of inward FDI into Jordanian and Australian are discussed as follows:

**H<sub>4a</sub>: There is a relationship between trade openness and FDI in Jordan over the study periods.**

**H<sub>4c</sub>: There is a relationship between trade openness and FDI in Australia over the study periods.**

In the case of Jordan, results of the ARCH model show that trade openness is significant at 10% and positively related to inward FDI in Jordan over the third study period. Jordan's foreign trade policy is based on standards of economic openness and integration into the rapidly globalising world economy. Jordan has made giant strides on the path of economic and trade liberalisation in addition to reinforcing mechanisms and functioning of a market-oriented economy that is built on an active role played by the private sector in managing economic activities. The above has been made possible by a concentrated reform process creating a modern and encouraging regulatory environment for business and investment.

Jordan nurtured its economic ties with neighbouring Arab countries by joining the Greater Arab Free Trade Area (GAFTA). Further, Jordan signed a number of bilateral trade agreements such as the European Union, free trade agreement with the United States of America, World Trade Organization (WTO), free trade agreements with the European Free Trade Association (EFTA) countries and Singapore. Therefore, Jordan undertook forward steps to liberalise its economy and attract more foreign investment.

Australian results of the ARCH model the hypothesis that trade openness is significantly and positively related to the behaviour of inward FDI. Surprisingly, trade openness is found to have a significant negative relationship with inward FDI at 10% in the third structural break.

It is widely perceived that Australia is a very open economy. Trade is considered an integral part of economic activity and Australia has a solid tradition of openness to global trade and investment, and transparent and efficient regulations are applied

consistently in most cases. The Australian Government supports the negotiation of comprehensive Free Trade Agreements (FTAs) that are consistent with the World Trade Organization rules and guidelines and which complement and reinforce the multilateral trading system. Australia has managed successfully to establish FTAs with the United States, Thailand, Singapore, Chile, and a multilateral FTA with New Zealand and the countries of the Association of Southeast Asian States (ASEAN) (Year Book Australia, 2009).

Studies (For example, Asiedu, 2002; Neumayer, 2005 and Babatunde, 2011) suggest that the decision of inward FDI is related to the trade openness. For example, Asiedu (2002) analyses the determinants of FDI inflows to developing countries and examined why Sub-Saharan Africa (SSA) was unsuccessful in attracting FDI despite policy reform. These researchers conclude that trade openness promoted FDI to both SSA and non-SSA countries, but the marginal benefit from increased openness is less for SSA.

The above suggests that trade liberalisation will generate more FDI to non-SSA countries than to SSA countries. Neumayer (2005) finds that countries more open to trade have higher inflows of foreign investment. This is further emphasised by Ang (2008) who studies the determinants of FDI for Malaysia to inform analytical and policy debates. Ang finds that an increase in the level of financial development infrastructure development and trade openness promoted FDI.

**H<sub>5a</sub>: There is a relationship between stock market price and FDI in Jordan over the study periods.**

**H<sub>5c</sub>: There is a relationship between stock market price and FDI in Australia over the study periods.**

The results of ARCH model support the acceptant of the hypothesis. The results indicate that stock market price is significant at 5% level, over the full period and at 10% level in the second period, in relation to movement of inward FDI in Jordan's economy over the study periods. That is, the coefficient of stock market price in the Amman Stock Exchange has the predicted theoretical positive relationship with inward FDI over the study periods.

The Amman Stock Exchange (ASE) provides several services to attract foreign investment. For example, the ASE is committed to the principles of fairness, transparency, efficiency, and liquidity. It seeks to provide a strong and secure environment for its listed securities, while protecting and guaranteeing the rights of its investors. To provide this transparent and efficient market, the ASE implemented internationally recognised directives regarding market divisions and listing criteria. The ASE works closely with the Jordan Securities Commission (JSC) on surveillance matters and maintains strong relationships with other exchanges, associations, and international organisations. The ASE is an active member of the Arab Federation of Exchanges, Federation of Euro-Asian Stock Exchanges (FEAS), a full member of the World Federation of Exchanges (WFE), and an affiliate member of the International Organization of Securities Commissions (IOSCO) (ASE report, 2010).

The results of analysis through the ARCH model in relation to Australia support the acceptant of the hypothesis. Stock market price is found to be significant at 10% level over the study periods, except for the full period at 5% level of significance. Therefore, the coefficient of stock market price in the Australian Stock Exchange (ASX) has the predicated positive relationship with inward FDI over the study periods.

The geographical location of Sydney gives ASX a unique feature, since it is the first major market to open in the world each day. In other words, Sydney's time zone provides companies with a unique opportunity to take advantage of the full trading day in Asia, while also linking with the closing of the US markets and the opening of the European markets. This allows global financial services firms to provide after-hours coverage for their US and European markets from Australia in a 'follow-the-sun' system (Mishra, 2013).

The ASX is the twelfth largest in the world. In February 2011, the market capitalization of domestic companies was valued at \$1.46 trillion. In terms of float market capitalization, the ASX is the sixth largest and in terms of listed domestic companies in the Asia Pacific has the third highest number (Mishra 2013).

The result of the effect of trade openness on inward FDI is consistent with the findings of (Naceur et al., 2007 and Kholdy & Sohrabian, 2007). Naceur et al. (2007) find that, among other studies the existence of an equity market is important because: it provides investors with an exit mechanism; attracts foreign capital (FDI) inflows; provides important information that improves the efficiency of the financial systems; and it provides the valuation of companies. Zakaria (2007) examines the causal relationship between inward FDI and financial development in 37 developing countries in a multivariate framework. The research uses two categories of financial development credit markets and equity markets to carry out the causality tests based on a multivariate model. The findings of this research concluded that there is bi-directional causality between inward FDI and development of the domestic stock market in the developing countries. The significant reverse causality from the stock market development to inward FDI indicates that the existence of a better developed stock market is imperative for attracting capital flows (FDI).

#### **5.5.1.3 Impact of Macro-economic Environment on Inward FDI.**

The findings of ARCH model in relation to whether not support the negative effect of macro-economic factors such as: inflation and interest rate on the flows of inward FDI into Jordanian and Australian are discussed as follows:

**H<sub>6a</sub>: There is a relationship between inflation rate and FDI in Jordan over the study periods.**

**H<sub>6c</sub>: There is a relationship between inflation rate and FDI in Australia over the study periods.**

The results of ARCH model support the hypothesis. Inflation rate is found to be significant at 1%, 5% and 10% level over the full, second and third study periods respectively. The coefficient has the predicated negative relationship with inward FDI over the study periods. Inflation has remained low in Jordan mainly due to stable monetary policy and the continued peg to the United States dollar.

Australian ARCH model indicates that the inflation rate is only significant at 10% level over the second and third study periods. The coefficient has the expected theoretical negative relationship with inward FDI over the study periods. The lower inflation rate in Australia indicates a stable macro-economic environment, making it

an attractive destination for foreign investment. Therefore, the results of ARCH model support the hypothesis.

The acceptance of the alternative hypothesis ( $H_{6a}$  and  $H_{6c}$ ) is supported by several studies (for example, Rammal & Zurbruegg, 2006; Hasen & Giorgioni, 2007 and Trevino et al., 2008). Rammal and Zurbruegg (2006) select annual inflation rates (measured as a function of the local consumer price index) as one of the control variables that regularly used in the FDI literature. The researchers argue that a higher inflation rate in a host country would be a disincentive to invest in that country. The researchers find a negative relationship between annual inflation rates and FDI. This means that an increase in inflation rate lessens FDI in the host country. This finding was also supported by Hasen and Giorgioni's (2007) findings. They studied the determinants of FDI inflows to Arab Maghreb Union (AMU) countries, analysing a data from 1990 to 2006, through simultaneous equation regression. Hasen and Gianluigi (2007) state that annual inflation rate has a significant negative effect on FDI, which may explain why Maghreb countries attract less FDI than other countries at a similar stage of development. Therefore, stable inflation rate is important to attract more FDI, which reflected in the Jordan and Australia results. As, they enjoy a stable macro-economic environment including inflation rate system.

**$H_{7a}$ : There is a relationship between interest rate and FDI in Jordan over the study periods.**

**$H_{7c}$ : There is a relationship between interest rate and FDI in Australia over the study periods.**

The findings of ARCH model support the hypothesis. Jordan's interest rate is found to be significant at 10% over the full study period. The coefficient of interest rate is found to have the predicated negative relationship with inward FDI in to Jordan's economy over the study periods. The Central Bank of Jordan (CBJ) is the ultimate controlling and monitoring body for all issues connected with foreign exchange in the kingdom. The CBJ has worked to maintain monetary stability and ensure the convertibility of the Jordanian Dinar (JOD). It oversees an interest rate structure consistent with the level of economic activity to provide a sound macroeconomic environment in Jordan (CBJ Report, 2010).

The results of ARCH model show that Australia's interest rate is significant at 10% over the full period. The coefficient of interest rate is found to have the predicated theoretical negative relationship with the inward FDI in Australian economy over the study periods. Australia is a price-taker in global capital markets; thus, the Australian interest rates move with the global financial market trends. Generally, Australian interest rates are higher compared to the international standards largely due to strong fiscal policies relative to other developed countries (Kirchner, 2007). In Australia, the Reserve Bank (RBA) determines the interest rate. It does so by changing the amount of money supplied; in other words, by altering the equilibrium between the quantity of money supplied and money demanded.

Many studies suggest that decisions regarding inward FDI are related to the interest rate (For example Farrell et al., 2000; Pan, 2003; Uctum & Uctum and 2011 Kirchner, 2012). Farrell et al. (2000) review the annual data of manufacturing industries and 16 countries for the period 1984-1995, in order to identify the determinants of Japanese FDI. The researchers report that interest rate is negative and significantly determines Japanese FDI. Pan (2003) explores the influences of host country factors such interest rates on inward FDI in China between 1984 and 1996. The researcher finds that firms in countries with low interest rates enjoy a cost advantage that enables them to raise more capital with a lower burden of interest payment. This means the cost of borrowing in the source country has a negative association with its inward FDI in China.

Kirchner (2012) constructs a model to determine inward FDI in Australia. The model estimates the effects of the liberalisation of foreign investment screening arrangement in the period following the Australia Free Trade Agreement with U.S (AUSFTA). The author uses quarterly data for the period 1988-2005. Based on analysis using VAR techniques, the researcher produced the following findings: trade weighted exchange rate and foreign interest rate appear to have negative effects on inward foreign investment (FDI and FII) in the Australian economy.

### **5.5.2 Determining Inward FII in Jordan and Australia in Contemporaneous Context**

This section discusses the contemporaneous results of the ARCH model used to determine inward FII in Jordan and Australia based on the full period (1996-2010)

and three structural breaks in the Jordanian times series data. Jordanian and Australian financial health, economic health and political stability are positively related to the inflows of inward FII in Jordan and Australia over the study periods.

Jordanian and Australasian trade openness is positively related to inward FII over the study period periods, except the second period and third period for Jordan and Australia respectively. Jordanian and Australian stock market price is positively related to the behaviour of inward FII. Further, the macro-economic factors such as: inflation and interest rate are negatively related to the behaviour of inward FII. The results of the specified ARCH model in relation to the hypotheses over the study periods are reported in Table 5.20:

**Table 5.20: Determining Inward FII in Jordan and Australia over Study Period**

Jordan (FII)	96-10	96-01	96-08	01-08	Australia (FII)	96-10	96-05	96-08	05-08
FR	+	+	+	+	FR	+	+	+	+10%
ER	+ 5%	+	+	+	ER	+	+ 5%	+ 1%	+
PR	+	+5%	+10%	+5%	PR	+ 10%	+ 10%	+	+
OP	+	+	-	-10%	OP	-5%	+1%	+ 5%	- 1%
IS	+ 10%	+10%	+ 10%	+	IS	+ 10%	+	+ 1%	+ 1%
INF	- 10%	-5%	-	-	INF	-10%	-	- 5%	-
INT	- 10%	-	-10%	-5%	INT	-5%	- 10%	-	-

Note: 1%, 5% and 10% indicate statistical significant at respectively, - : represent negative relationship and rejection of the alternative hypothesis, +: represents positive relationship and rejection of the alternative hypothesis.

#### 5.4.2.1 Discussion of inward FII in Jordan and Australia and their Country Factors

This sub-section discusses whether or not Jordan and Australia country factors include financial and economic health and political stability have contemporaneous relationships with inward FII in those countries as follows:

**H<sub>1b</sub>: There is a relationship between financial health and FII in Jordan over the study periods.**

**H<sub>1d</sub>: There is a relationship between financial health and FII in Australia over the study periods.**

Evidence from the ARCH model shows the rejection of the hypothesis of Jordanian financial health over the study periods. However, the coefficient of financial health has the predicated positive relationship with the flows of inward FII in Jordan's

economy during each study period. According to ICRG, high financial risk rate reflect high financial health. Financial health covers the stability of exchange rates, interest rates, external debt and current account. The acceptance of the alternative hypothesis in terms of the predicated sign is supported by previous studies relating to the financial health of a foreign country.

Evidence from the ARCH model show that the alternative hypothesis is accepted, Australian financial health is found to be significant at 10% level in the third structural break period. Further, the coefficient of the financial health has the predicated positive relationship with the flows of inward FII in the Australian economy over the study periods. Many studies indicate that the decision of inward FDI is related to financial health, as in (Chakraborty & Rawlins, 2004; Baek, 2006; Yan, 2007; Ciprian & Mihai, 2008 and Santis & Lührmann, 2009). Therefore, financial health plays a major role in determine the behaviour of inward FII in Australia, while in Jordan does not consider as influential factor to make foreign investment decision.

Chakraborty and Rawlins (2004) find that short-term interest rates attract new inward foreign investment in the form of FII in Latin America and East Asia. Ciprian and Mihai (2008) study the behaviour of inward FII in Romania and its external debt using an autoregressive model. They reported that increase in Romanian external debt led to more inward FII. De Santis and Lührmann (2009) use a set of data covering a large number of countries from 1970 to 2003, to study the relationship between interest rates and inward FII location. They conclude that a high money stock to GDP ratio implies lower interest rate in domestic stock, but it discourages investment in fixed income. Australia's strong and stable financial system and well-managed companies make it a highly attractive location for foreign investment. In 2011, Australia received over \$2 trillion as total stock of foreign investment(Mishra 2013).

**H<sub>2b</sub>: There is a relationship between economic health and FII in Jordan over the study periods.**

**H<sub>2d</sub>: There is a relationship between economic health and FII in Australia over the study periods.**

Results of the ARCH model show that economic health is significant at 5% level over the full study periods. Further, the coefficients of economic health have the predicated positive relationship with the inflows of inward FII in Jordan's economy over the study period. Jordan economy has a reasonable gross national product (GDP) per head and low inflation rate

Results of Australian ARCH model show that the economic health is significant over the first and second structural breaks at 5% and 1% levels. The coefficients of economic health have the predicated positive relationship with the inflows of inward FII in Australian economy during each study periods. According to ICRG, a high economic risk in a host country indicates a stable and healthy economy. The Australian economy has high GDP per head and low inflation rate, which makes it an attractive destination for foreign investors.

The result of the ARCH model is largely supported by the findings of (Durham (2004), Baek (2006) and Guerin (2006). Baek (2006) uses quarterly cross-sectional and time series data from 1989 to 2002 and finds that GDP has a significant impact on inward FII inflows to Latin American and Asian economies. Guerin (2006) examines the role of geography in the spatial allocation patterns of FDI, trade and FII. As both FDI and FII have become important sources of foreign finance, their patterns of allocation can indicate whether geography matters for a host country in attracting financial flows. Guerin uses a modified gravity model and suggests that inward FII flows are more sensitive to the macroeconomic fundamentals in the model such as GDP, GDP per capita, size and income of the host country, than inward FDI. Further, Guerin (2006) points out that FII, compared to FDI, is highly sensitive to changes in GDP per capita. This implies that if there is a negative output shock, portfolio investment flows will be more volatile than FDI.

Jordan has enhanced its business and macroeconomic environments, thereby leading to significant flows of investment from foreign sources, which averaged some 27 per cent of GDP in the period 2000-2008. Jordan has a network of agencies that work to invite and attract investments into the country. In particular, these agencies propose a variety of motivations and exemptions for different businesses based on the country's region and the applicability of the given investment. Moreover, Jordan's investment-related laws are comprehensive, covering all major aspects of

investing, registering and operating businesses. In order to maintain Jordan's competitive position in the region and globally, some of these laws are being reformulated (ESCWA Report, 2009).

Foreign investors hold a massive amount of Australian investment by investing directly and indirectly in the Australian economy. This is a consequence of the strong and stable Australian economic conditions and the deregulations of industries such as finance telecommunications and utilities. Also, the mining industry boom and the liberalization of air transport ownership rules have made Australia an attractive destination for foreign investment (FDI and FII). In 2010, the total foreign investment in Australia was \$2 trillion (Mishra, 2013).

**H<sub>3b</sub>: There is a relationship between political stability and FII in Jordan over the study periods.**

**H<sub>3d</sub>: There is a relationship between political stability and FII in Australia over the study periods.**

The results of Jordanian ARCH model indicate that the hypothesis of political stability is accepted at 5 % of significance over the first study period (1996-2001), the second period (1996-2008) at 10% level significance and the third period (2001-2010) at 5% level of significance. The coefficient of political stability has the expected positive sign over the study periods. In other words, the political stability of a foreign country positively related to inward FII.

According to ICRG, the high political risk rate reflects lower political risk rate and a stable political environment. Although Jordan has fairly strong political stability (for example protection of property rights, voice and accountability government, low corruption, transparency and legislations), it is surrounded by unstable regimes. This means that Jordan has to work hard to attract foreign investment. Thus, high political risk ratings are associated with high flows of inward FII in Jordan's economy.

In the case of Australia, the evidence from the ARCH model indicates that the alternative hypothesis of political stability is accepted in the full and the first period at 10% level of significance. The coefficient of political stability has the expected positive relationship with inward FII over the study periods. The strength of Australia's investment positions and attractiveness of foreign investment have been

highlighted in recent years by its political stability, low level of corruption, government accountability, protection of property rights, transparency and legislation.

The acceptance of the alternative hypothesis in terms of the expected theoretical sign is supported by several studies, including Errunza, (2001), Stasavage (2002), Bekaert and Harvey (2003), Quan and Reuveny (2003) and Hunter (2005). Stasavage (2002) finds that a strong negative association exists between the absence of political ‘checks and balances’ and FII inflows to developing economies. However, Quan and Reuveny (2003) point out that inward FII and democracy are negatively associated. The second view of the relationship between voice and accountability governance and inward FII finds a positive association. Quan and Reuveny (2003) investigate the relationship between globalisation and FDI inflows, FII inflows and the spread of democratic ideas. Li and Reuveny (2003) find that FDI inflows are positively associated with democracy.

#### **5.5.2.2 Impact of Trade Openness and Stock Market price on Inward FII.**

The findings of ARCH model in relation to whether not support the positive impact of trade openness policy and stock market price on the flows of inward FII into Jordanian and Australian are discussed as follows:

**H<sub>4b</sub>: There is a relationship between trade openness and FII in Jordan over the study periods.**

**H<sub>4d</sub>: There is a relationship between trade openness and FII in Australia over the study periods.**

According to the ARCH model results, Jordan’s trade openness is found to be negative and significant at 10% over the third period (2001-2008). Australia’s trade openness is found to be negatively significant at 5% and 1% levels over the full and third study periods. Further, the first and second structural break indicates a positive relationship with inward FII in Australia and significant at 1% and 5% levels respectively.

Many studies suggest that inward FII decisions are related to the trade openness as in Ahmed et al. (2005), Guerin (2006) and Aron et al. (2010). Ahmed et al. (2005) examined the level and composition of FII including portfolio equity and bonds and

inward FDI. The authors explore a dynamic forest of up to 18 emerging markets by applying the Generalised Method of Moments (GMM). They find that the trade openness had a positive impact on inward FII in South Africa.

Guerin (2006) uses a modified gravity model and finds that inward FII flows are more sensitive to the macro-economic fundamentals in the model such as GDP, GDP per capita, size and income of the host country than inward FDI. Further, Guerin point out that FII, compared to FDI, are highly sensitive to changes in GDP per capita. Aron et al. (2010) examine inward FII as a key source of foreign investment in South Africa. The researchers employ VECM and quarterly data from 1985 to 2007 and find that the trade openness has a significant positive effect on the capital flows (FDI and FII) in South Africa.

**H<sub>5b</sub>: There is a relationship between stock market price and FII in Jordan over the study periods.**

**H<sub>5d</sub>: There is a relationship between stock market price FII in Australia over the study periods.**

According to the ARCH model results, Jordan's stock market price in the Amman Stock Exchange is found to have the predicated relationship with inward FII at 10% level of significance over the study periods. Amman Stock Exchange provides several services to attract foreign investment. Australia's stock market price in the Australia Stock Exchange is found to have the predicated positive relationship with inward FII to be significant at 10%, 1% levels over the full, second and third periods respectively.

The result of the ARCH model is consistent with the findings of Chan et al. (2005) and Thapa and Poshakwale (2012). Chan et al. (2005) apply different determined variables, such stock market development factors, to explain the relationship between foreign and home bias. Chan et al. (2005) use data for 26 countries (emerging and developed) and find that stock market development and bilateral familiarity issues affect investors, but investor protection does not play any significant role in their investment decisions.

Thapa and Poshakwale (2012) examine the relationship between attractiveness of inward FII and several variables of the financial market, such as market size,

liquidity (level of market efficiency) and transaction costs. They use from comprehensive foreign equity portfolio holdings and different measures of country-specific equity market factors drawn from 36 host countries. They used panel data econometric estimations (2001-2009).

### **5.5.2.3 Impact of Macro-economic Environment on Inward FII.**

The findings of ARCH model in relation to whether not support the negative effect of macro-economic factors such as: inflation and interest rate on the flows of inward FII into Jordanian and Australian are discussed as follows:

**H<sub>6b</sub>: There is a relationship between inflation rates and FII in Jordan over the study periods.**

**H<sub>6d</sub>: There is a relationship between inflation rates and FII in Australia over the study periods.**

Inflation rate is found to be significant only at 10%, 5% and 1% levels for the full, first and second periods, respectively. Jordan's inflation is found to have the predicated negative relationship with inward FII. The results of the ARCH model suggest that Australia's inflation is found to be significant and negative at 10% and 5% respectively over the full study period and second structural break. Studies (Maela, 2009; Poshakwale and Thapa, 2011) have indicated a similar interconnection between FII and the level of a foreign economy's inflation.

Maela (2009) examines how inflation hedging affects the ratio of the inward FII flows in different countries, stock returns from DataStream-Thomson and the inflation rate from the international financial statistics (IFS). Maela finds that inflation hedging is not significant in driving international indirect investment choice. However, Poshakwale and Thapa (2011) examine the influence of economic risk sub-components such as inflation risk, on international equity portfolio investment. They analysed a bilateral portfolio holding data for 36 countries covering the period from 2001 to 2006. Their findings indicate that inflation risk is statistically significant in determining inward FII. Therefore, the level of a host country's inflation affects foreign investors' decisions when choosing a location for inward FII.

**H<sub>7b</sub>: There is a relationship between interest rates and FII in Jordan over the study periods.**

**H<sub>7d</sub>: There is a relationship between interest rates and FII in Australia over the study periods.**

According to results of the ARCH model, Jordan's interest rate accepts the hypothesis at 10%, 10% and 5% levels of significance over the full, second and third periods, respectively. Jordan's interest rate is found to have the predicated negative relationship with inward FII. The Central Bank of Jordan (CBJ) is the ultimate controlling and monitoring body for all issues connected with foreign exchange in the kingdom. The CBJ has worked to maintain monetary stability and ensure the convertibility of the Jordanian Dinar (JOD). It oversees an interest rate structure consistent with the level of economic activity to provide a sound macroeconomic environment in Jordan (CBJ Report, 2010). The stability of Jordanian interest rate system provides foreign investors with stable sources of money through issuing stock market or bonds to finance their economic activities

Australia's interest rate is negatively related to the inward FII over the study periods. The interest rate is found to be significant at 5% and 10% level in the full and first periods respectively. Further, coefficients of interest rate are found to have negative sign of impact on inward FII over the study periods. This is in keeping with other studies (For example, Baek, 2006; Kottaridi & Siourounis, 2007 and De Santis & Lührmann, 2009), who find the decision of inward FDI is related to interest rate.

Baek (2006) finds a negative relationship between the US interest rate and indirect investment. De Santis and Lührmann (2009) used drawn from a large number of countries from 1970 to 2003, in order to study the relationship between interest rates and inward FII location. They concluded that high money stock to GDP ratio implied lower interest rate in domestic stock, but discouraged investment in fixed income.

## 5.6 Conclusions

One of this study's goals is that explore drawing an Jordanian and Australian data the contemporaneous relationship between foreign investment (FDI and FII), a country's risk factors (financial, economic and political risk rate), trade openness, stock market prices and macro-economic environment. This Chapter compares and contrasts the findings of the ARCH model over the full period and the major structural break in the Jordanian and Australian time series data.

Based on evidence from the ARCH model over the full period and major structural break, economic health, stock market price, inflation and interest rates are related to the behaviour of inward FDI in Jordan. Conversely, the major factors relate to inward FDI in Australia are financial health, political stability, trade openness, stock market prices, inflation rate and interest rates.

Similarly, the results from the ARCH model over the full period (1996-2010) and the major structural break (1996-2008) reveal that economic health, political risk rate, stock market prices, inflation and the interest rates are related to inward FII in Jordan. In contrast, economic health, political stability, trade openness, stock inflation and interest rate are found to be significant determinants of inward FII in Australia. The main findings of this study are reported in Chapter Six and discussed in Chapter Seven.

## **CHAPTER SIX**

### **MAIN FINDINGS**

#### **6.1 Introduction**

In the main analysis, the theoretical models developed in Chapter Three are empirically tested to investigate how the optimally lagged variables influence the volume of inward FDI and FII into Jordan and Australia. Inward FDI and FII into Australia is introduced and empirically tested in order to compare both with those of Jordan. The purpose of doing so is to understand policy implications for the improvement and enhancement of Jordan's microeconomic and macroeconomic status, and to attract more foreign investment.

Australian strong and stable economy and well-managed companies makes it a highly attractive location for foreign investment. In addition, Australia has an AAA international credit rating with a well-developed, deep and sophisticated financial market, regulated in accordance with international criteria. In terms of global turnover, Australia's foreign exchange market is the seventh largest in the world, and the Australian dollar is the fourth most traded currency globally (BIS, 2010).

In this Chapter, more advanced econometric techniques are applied. These include a VAR model a VECM model with cointegration and Granger causality tests together with impulse response functions and variance decompositions analysis based on monthly data from 1996 to 2010, these are applied in order to examine the dynamic movements of inward foreign investment (FDI and FII) in Jordan and Australia. The study did not split the data of main analysis in relation to different structural breaks; as a precaution take to protect the degrees of freedom and market information, in a limited time series data set.

This Chapter is divided into two main parts. The first part covers the results of long-term equilibrium relationships, and short-term dynamic relationships, of inward FDI and FII flows to Jordan's economy. The second part covers the results of these same within the Australia's economy.

## **6.2 Determinants of Inward Foreign Direct Investment in Jordan**

The method analyses consist of five steps. The first step is established the order of integration of the series under consideration by implementing unit root tests, such as Augmented Dickey–Fuller (ADF) (Dickey & Fuller, 1979) and Phillips–Perron (PP) (Phillips & Perron, 1988). The second step consisted of tests for long-term relationships between the specified variables and cointegration by employing the Johansen and Juselius (1990) approach after confirming the integrated variables were of the same order. The third step is tested for short-term relationships between the foreign investment (FDI and FII), country factors, trade openness, stock market price and macro-economic environment in Jordan and Australia and the speed of adjustment for error correction terms applying VECM. The fourth step is to test for Granger causality in a multivariate VECM framework. The fifth step employed impulse response function and variance decompositions and analysis.

### **6.2.1 Integration**

Stock and Watson (1989) argue that Granger causality tests are sensitive to the stationarity of the series, where Nelson and Plosser (1982) conclude that macro-economic time series data are usually non-stationary, producing spurious regressions. Hence, as a first step to the analysis, the stationarity characteristics of the series are examined through unit root tests. Further, a required condition for cointegration is that all-time series data in the relationship should be subject to the same order of integration. The order of integration is the number of times that a series has to be differenced before it becomes stationary.

The ADF and PP tests are carried out to test for the presence of unit roots in both levels and first differences of the times series data and to establish the order of integration of the series. According to Perron (1989) and Perron and Vogelsang (1992), the PP test for unit root provides better results when there are possible structural breaks in the time series. Therefore, both tests are utilised to determine the stationary variables and order of integration. The null hypothesis of ADF and PP tests is that a unit root exists among the variables in levels, as against the alternative of stationarity. Table 6.1 presents the unit root results of the ADF and PP tests.

**Table 6.1: Unit Root Test (FDI & FII Jordan and Australia)**

Variables (Jordan)	t- Statistics in Log		t-statistics in Log First Differences	
	ADF	PP	ADF	PP
<b>FDI</b>	-2.4342	-8.4868***	-10.8252***	-40.9452***
<b>FII</b>	-2.0782	-2.2104	-12.7915***	-12.8048***
<b>Financial Risk (FR)</b>	-1.7107	-1.9030	-13.7753***	-13.7761***
<b>Economic Risk (ER)</b>	-1.8362	-1.8362	-13.3084***	-13.3207***
<b>Political Risk (PR)</b>	-2.0800	-1.9971	-14.4081***	-14.4081***
<b>Openness Trade (OP)</b>	-12.6336***	-12.6827***	-10.7366***	-110.1365***
<b>Stock Market Price (IS)</b>	-1.9226	-1.4694	-6.8878***	-10.1802***
<b>Inflation (INF)</b>	1.3752	-0.6168	-10.8655***	-18.3652***
<b>Interest Rate (INT)</b>	-0.5728	-3.3481*	-18.4651***	-58.7914***
Variables (Australia)	t- Statistics in Log	PP	t-statistics in Log First	Differences
<b>FDI</b>	-2.4342	-8.4868***	-10.8252***	-40.9452***
<b>FII</b>	-2.0782	-2.2104	-12.7915***	-12.8048***
<b>Financial Risk (FR)</b>	-1.7107	-1.9030	-13.7753***	-13.7761***
<b>Economic Risk (ER)</b>	-1.8362	-1.8362	-13.3084***	-13.3207***
<b>Political Risk (PR)</b>	-2.0800	-1.9971	-14.4081***	-14.4081***
<b>Openness Trade (OP)</b>	-12.6336***	-12.6827***	-10.7366***	-110.1365***
<b>Stock Market Price (IS)</b>	-1.9226	-1.4694	-6.8878***	-10.1802***
<b>Inflation (INF)</b>	1.3752	-0.6168	-10.8655***	-18.3652***
<b>Interest Rate (INT)</b>	-0.5728	-3.3481*	-18.4651***	-58.7914***

The critical values for ADF and PP test with intercept are at 1% level -3.467, 5% level -2.877 and 10% level -2.575.

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

The results indicate that the null hypothesis of both tests cannot be rejected when all variables are in levels series. In other words, the variables in levels are non-stationary, as the value of the (*t*) statistic is greater than the critical values of the ADF and PP test. The data are transformed from levels to first difference test again,

for stationary and non-stationary time series data. The results indicate that the acceptance of the alternative hypothesis at %1 level as the ( $t$ ) statistic is smaller than the critical values of the ADF and PP tests. Therefore, the variables are stationary and integrated in the first order ( $I(1)$ ) and it is appropriate to proceed to test for cointegration.

Hence, the study confirms integrated non-stationary processes, leaving the path free to specify a VAR model and test for long-term relationships and cointegration using the Johansen and Juselius (1990) approach, exogeneity and short-term relationship employing VECM, Granger's (1988) causality test and confirmation of results by impulse responses function and variance decomposition analysis. The next step is to test long-term relationships using the Johansen and Juselius approach (1990) in a multivariate framework.

### **6.3. Long-Term Equilibrium Relationships (FDI Jordan and Australia)**

Since the specified variables are integrated in the first order ( $I(1)$ ), this implies that they may have a long-term equilibrium relationship and may deviate from that relationship in the short-term, but will always return to it the long-term.

This study employs the Johansen and Juselius (1990) approach test for cointegration; this method is preferred mainly due to the ability to detect more than one cointegration relationship, as opposed to the Engle-Granger approach. In addition, the Johansen and Juselius approach depends on the relationships between the rank of the matrix and its characteristic roots, so it is more suited for a multivariate system (Verbeek, 2008). Therefore, several steps are used to detect the long-term equilibrium relationships as follows: The VAR model is specified in level series and tested for stability. The optimal lag is determined by the use of information criteria. A cointegration test is applied, if cointegration is proven the model is respecified into a VECM with the lag determined by the VAR information criteria to confirm the existence of the long-term equilibrium by the use of Johansen cointegration test.

### 6.3.1 Vector Autoregressive Model (FDI Jordan Australia)

The VAR model has the advantage of treating each variable in the study as an endogenous variable when economic theory cannot offer a priori information regarding the variables used in the VAR (Gujarati, 1995). Since lag length is determined, the VAR model is applied to capture the long-term relationships among the exogenous and endogenous variables. Table 6.2 shows the R-squared and adjusted R-squared values of the VAR model for Jordan and Australia.

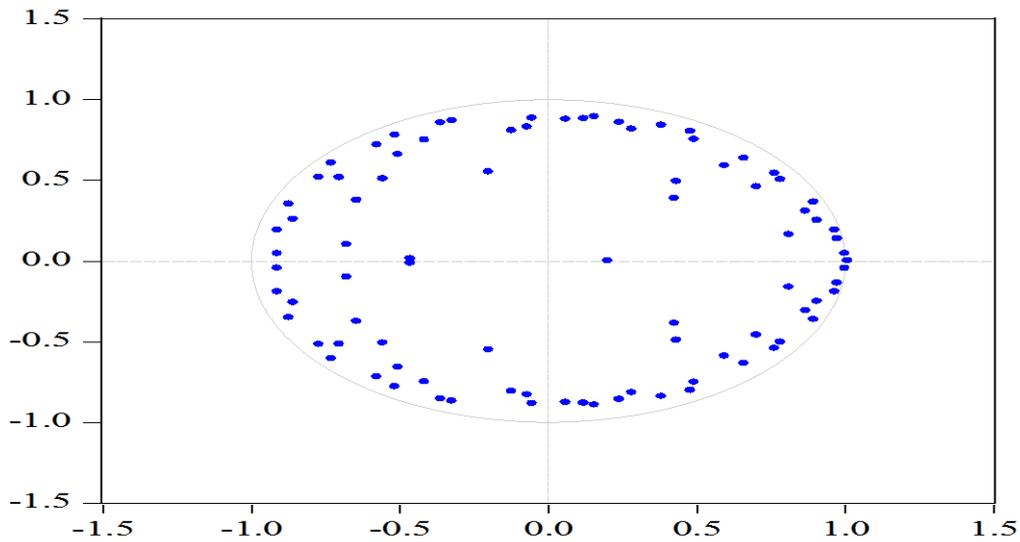
**Table 6.2: Vector Autoregressive Results (FDI Jordan Australia)**

Variable Jordan	FDI	FR	ER	PR	OP	IS	INF	INT
<b>R-squared</b>	0.6383	0.4888	0.7062	0.4309	0.6411	0.6529	0.5898	0.6232
<b>Adjusted R-squared</b>	0.2354	-0.0805	0.3790	-0.2028	0.2414	0.2663	0.1330	0.2036
Variable Australia	FDI	FR	ER	PR	OP	IS	INF	INT
<b>R-squared</b>	0.5890	0.5669	0.520	0.4139	0.6180	0.4662	0.4055	0.453
<b>Adjusted R-squared</b>	0.2153	0.1731	0.0842	-0.1180	0.2708	-0.0190	-0.1340	-0.043

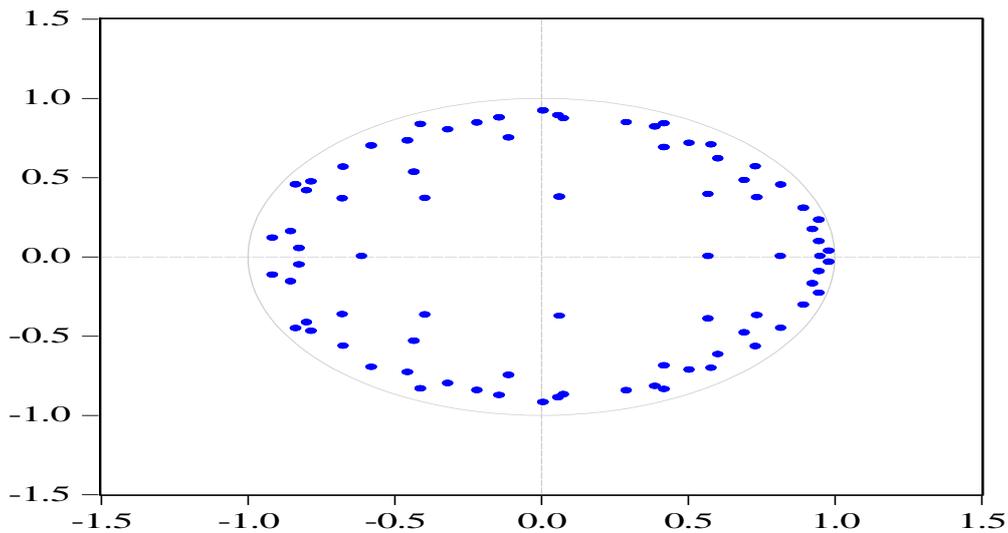
In the case of the specified model, the results show that the R-squared value is 0.2354, comparing to Australia's VAR model where the R-squared is 0.2153. In other words, the exogenous variables including Jordan's and Australia's country factors (financial and economic health and political stability), trade openness, stock market price and macroeconomic factors (inflation and interest rate) explain 0.2354 and 0.2153 of the behaviour of inward FDI in Jordan and Australia, respectively. Therefore, the VAR model is a good fit for examining inward FDI.

Figure 6.1 shows the Jordan VAR model stability condition test. Since no root lies outside the unit circle, the VAR model is deemed to be stable. Figure 6.1 shows that Jordan's VAR model is stable and the same is the case in Australia (See Figure 6.2).

**Figure 6.1: Inverse Roots of VAR Characteristic Polynomial (FDI Jordan)**



**Figure 6.2: Inverse Roots of VAR Characteristic Polynomial (FDI Australia)**



According to Stock and Watson (1993), the Johansen approach is sensitive to the lag length used in the VECM and to the sample-ending point. The lag length order selection criteria of the VAR model is used to determine the required length of the lag for the Johansen cointegration test. The lag selection in VAR model criterion is based on the Akaike information criterion (AIC) by Akaike (1973), Schwarz information criterion (SIC) by Schwarz (1978), the Hannan-Quinn criterion (HQ) by Hannan and Quinn (1978). Table 6.3 presents the results of VAR lag order selection criteria for the three tests.

**Table 6.3 VAR Lag Length Order Selection Criteria (FDI Jordan and Australia)**

Lag Jordan	LogL	LR	FPE	AIC	SC	HQ
0	-10026.600	NA	1.8200	118.7768	118.9620	118.8520
1	-8564.2000	2734.497	1.8100*	102.6533	104.6905*	103.4800*
2	-8476.7300	153.2018	2.1200	102.8016	106.6908	104.3799
3	-8382.3600	154.1195	2.3400	102.8682	108.6094	105.1981
4	-8299.5100	125.4987	3.0300	103.0712	110.6644	106.1526
5	-8219.7900	111.3196	4.2400	103.3112	112.7565	107.1443
6	-8122.7700	124.0003	5.0800	103.3465	114.6438	107.9311
7	-8048.8900	85.68724	8.5700	103.6556	116.8048	108.9918
8	-7948.1300	104.9316	1.1500	103.6466	118.6479	109.7344
9	-7812.6100	125.0967*	1.1400	103.2262	120.0795	110.0656
10	-7693.8100	95.60688	1.6100	103.0037	121.7090	110.5946
11	-7516.6300	121.6149	1.4000	102.0903*	122.6476	110.4328
Lag Australia	LogL	LR	FPE	AIC	SC	HQ
0	-9308.7400	NA	1.9400	109.6322	109.8167	109.7071
1	-7645.4300	3111.363	2.0000	91.2403	93.2694*	92.0637*
2	-7561.0500	147.9219	2.4300	91.4240	95.2977	92.9959
3	-7426.8900	219.3878	1.6700*	91.0222	96.7404	93.3426
4	-7329.0300	148.5224	1.8100	91.0473	98.6101	94.1162
5	-7227.4400	142.2263	1.9600	91.0286	100.4360	94.8460
6	-7155.7900	91.87733	3.1500	91.3622	102.6142	95.9281
7	-7039.0400	135.9783	3.1900	91.1651	104.2617	96.4796
8	-6927.5800	116.7009	3.7500	91.0303	105.9715	97.0933
9	-6795.2200	123.0162	3.8400	90.6496	107.4354	97.4611
10	-6619.5500	142.6081*	2.7400	89.7593*	108.3897	97.3193

\*Indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level).

FPE: Final prediction error.

AIC: Akaike information criterion.

SC: Schwarz information criterion.

HQ: Hannan-Quinn information criterion.

Table 6.3 shows the maximum possible lag length of Jordan and Australia. The first column provides the lag length for each test and the last three columns of the Table illustrate the test statistics. In this case, the choice is ambiguous, because apparently only one lag is needed by the SC and HQ, 11 lags with the AIC for Jordan and 10 lags for Australia. Further examination finds serial correlation at one lag. Therefore, the 11 lag length of the VAR is selected for Jordan and 10 lags for Australia by AIC information criteria, since they are not serially correlated.

### 6.3.2 Cointegration Test (FDI Jordan and Australia)

The study conducts a cointegration test to explore the dynamic movement of inward FDI in long-term equilibrium relationships with Jordanian and Australian country risks, trade openness, stock market price and macro-economic factors. Having established the time series properties of the data, the test for the presence of long-term equilibrium relationships between variables using the Johansen and Juselius (1990) approach is conducted. The Johansen approach determines the number of cointegrated vectors for any given number of non-stationary variables of the same order. The null hypothesis and the alternative hypothesis of the Johansen and Juselius (1990) approach are as follows:

- $H_0$ : There is no long-term cointegration relationship among inward FDI, country risks, trade openness, stock market price and macroeconomic factors.
- $H_1$ : There is a long-term cointegration relationship among inward FDI, country risks, trade openness, stock market price and macro-economic factors.

The Johansen approach has two-test statistics for cointegration: the  $\lambda_{\text{trace}}$  (Trace test) and the  $\lambda_{\text{max}}$ . (Maximum eigenvalue test). The  $\lambda_{\text{trace}}$  is a joint test where the null hypothesis is the number of cointegrating vectors being less than or equal to  $r$  and the alternative hypothesis is that there are more than  $r$ . The  $\lambda_{\text{max}}$ . conducts separate tests on each eigenvalue and its null hypothesis is that the number of cointegrating vectors is  $r$  against an alternative hypothesis of  $r+1$ .

The results of  $\lambda_{\text{trace}}$  and  $\lambda_{\text{max}}$ . tests for Jordan and Australia are reported in Table 6.4 and suggest that the null hypothesis of no cointegrating vectors can be rejected at the 1% level of significance. More precisely, Table 6.4 shows that the Trace and Max. eigenvalue tests accept the alternative hypothesis of existing long-term cointegration relationships.

**Table 6.4: Johansen Cointegration Analysis of Unrestricted Cointegration Rank of Trace and Max. Eigenvalue Test (FDI Jordan and Australia)**

Hypothesized No of CE(s) Jordan	Eigenvalue	Trace Statistic	0.05 Critical Value	Max.-Eigen Statistics	0.05 Critical Value
None	0.5229	323.5167***	159.5297	124.3504***	52.3626
At most 1	0.2573	199.1663***	125.6154	49.98655***	46.2314
At most 2	0.2282	149.1797***	95.7537	43.52925***	40.0775
At most 3	0.1994	105.6505***	69.8188	37.37807***	33.8768
At most 4	0.1623	68.2724***	47.8561	29.75636***	27.5843
At most 5	0.0953	38.5160***	29.7970	16.83916	21.1316
At most 6	0.0762	21.6769***	15.4947	13.31866***	14.2646
At most 7	0.0485	8.3582***	3.8414	8.358238***	3.84146

Hypothesized No of CE(s) Australia	Eigenvalue	Trace Statistic	0.05 Critical Value	Max.-Eigen Statistics	0.05 Critical Value
None	0.4580	295.6267***	159.5297	102.9221***	52.3626
At most 1	0.3771	192.7045***	125.6154	79.5447***	46.2314
At most 2	0.2224	113.1599**	95.7537	42.2720**	40.0776
At most 3	0.1506	70.8879**	69.8189	27.4356	33.8769
At most 4	0.1118	43.4522	47.8561	19.9333	27.5843
At most 5	0.0787	23.5190	29.7971	13.7881	21.1316
At most 6	0.0562	9.7308	15.4947	9.7301	14.2646
At most 7	4.4406	0.0008	3.8415	0.0008	3.8415

Trace and Max.-eigenvalue testes indicate 8 and 5 cointegrating equations and 4 and 3 cointegrating equation for Australia respectively at the 0.05 level.

\* denotes rejection of the hypothesis at the 0.05 level.

\*\*MacKinnon-Haug-Michelis (1999) p-values.

\*\*\*indicate statistical significant at 1% level.

Since the calculated Trace (199.1663) is above the critical values (125.6154) at 1% level, it can clearly reject the null hypothesis of no cointegration between Jordan's specified variables, at most 2. The alternative hypothesis is accepted at 1% significance level as the Trace statistic (149.1797) is greater than the critical value (95.7537). The null hypothesis, at most 3, is rejected as the Trace statistic (105.6505) is above the critical value (69.8188). The alternative hypothesis, at most 4, is accepted at the one significant level as the Trace statistic (68.2724) is greater than the critical value (47.8561); at most 5, the Trace statistic (38.5160) is greater than the critical value (29.7970), meaning that there is significant cointegration at 1% level between Jordan's specified variables. The null hypothesis, at most 6, is rejected at 1% level of significance as the trace statistic (21.6769) is greater than the critical value (15.4947). Finally, at most 7, the alternative cannot be rejected at 1% level of significance as the Trace statistic (8.3582) is above the critical value (3.8415).

More precisely, Table 6.4 shows that the  $\lambda_{\max}$ . test accepts the alternative hypothesis of existing long-term cointegration relationships between Jordan's specified variables. Since the calculated  $\lambda_{\max}$ . (49.9866) is above the critical value (46.2314) at 1% level, it can clearly reject the null hypothesis of no cointegration, at most 2; the alternative hypothesis is accepted at one significant level as  $\lambda_{\max}$ . statistic (43.5293) is greater than the critical value (40.0776). The null hypothesis, at most 3, is rejected as the  $\lambda_{\max}$ . statistic (37.3781) is above the critical value (33.8769). The alternative hypothesis, at most 4, is accepted at one significant level as the  $\lambda_{\max}$ . statistic (29.7564) is greater than the critical value (27.5843). However, the null hypothesis, at most 5, cannot be rejected as  $\lambda_{\max}$ . statistic (16.8392) is smaller than the critical value (21.1316). Finally, at most 6, the alternative cannot be rejected at 1% level of significance as the  $\lambda_{\max}$ . statistic (13.3187) is above the critical value (14.2646).

Further, Table 6.4 shows that the Trace test accepts the alternative hypothesis of existing long-term cointegration relationship between Australian specified variables include: inward FDI, country risks, trade openness, stock market price and macro-economic environment. Since the calculated Trace (192.7045) is above the critical values (125.6154) at 1% level, it can clearly reject the null hypothesis of no cointegration, at most 2 the alternative hypothesis is accepted at 1% significant level as the Trace statistic (113.1599) is greater than the critical value (95.7537). The null hypothesis, at most 3, is rejected as the Trace statistic (70.8879) is above the critical value (69.8189). The alternative hypothesis, at most 4, is rejected as the Trace statistic (43.4522) is less than the critical value (47.8561), at most 5, the Trace statistic (23.5190) is less than the critical value (29.7971), meaning that there is no cointegration relationship existed; the null hypothesis at most 6 cannot be rejected as the Trace statistic (9.7308) is less than the critical value (15.4947). Finally, at most 7 the alternative is rejected as the Trace statistic (0.0008) is above the critical value (3.8415).

Additionally, Table 6.4 shows that the  $\lambda_{\max}$ . test accepts the alternative hypothesis of existing long-term cointegration relationships between Australia's specified variables. Since the calculated  $\lambda_{\max}$ . (79.5447) at most 1 is above the critical value (46.2314) and significant at 1% level, it can clearly reject the null hypothesis of no

cointegration, at most 2, the alternative hypothesis is accepted at 1% level of significance as the  $\lambda_{\max}$  statistic (42.2720) is greater than the critical value (40.0776). However, the null hypothesis, at most 3, is accepted as the  $\lambda_{\max}$  statistic (27.4356) is less than the critical value (33.8769). The alternative hypothesis, at most 4, is rejected as the  $\lambda_{\max}$  statistic (19.9333) is less than the critical value (27.5843). Also, the null hypothesis, at most 5, cannot be rejected as the  $\lambda_{\max}$  statistic (13.7881) is smaller than the critical value (21.1316). Finally, at most 6 and 7 the null hypothesis cannot be rejected as the  $\lambda_{\max}$  statistic (9.7301 and (0.0008) is less than the critical values of 14.2646 and 3.8415 respectively.

Therefore, Trace and  $\lambda_{\max}$  tests indicate that there are eight and five cointegrating equations, respectively; at 1% level of significance between Jordan's specified variables. The Trace and  $\lambda_{\max}$  tests also indicate that there are four and three cointegrating equations respectively at 1% level of significance between Australia's specified variables. This indicates there is the possibility of causality between inward FDI flows into Jordan and into Australia, country risk, trade openness, stock market price and macro-economic factors. Therefore, the VECM is implemented to confirm cointegration, test exogeneity and investigate the speed of adjustment to equilibrium of the inward FDI model through examination of the error correction terms (ECTs).

### **6.3.3 Speed of Adjustment Error Correction Terms (FDI Jordan and Australia)**

Having confirmed the VAR, and optimal lag and existence of the long-term equilibrium relationship between the specified variables in the system, the VECM is applied in order to re-test the long-term equilibrium and evaluate the short-term properties of the cointegrated series in Jordan and Australia. The coefficients of ECTs contain information about whether the past values affect the current values of the specified variables. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes. The information obtained from the ECTs is related to the speed of adjustment of the system towards long-term equilibrium. The short-term dynamic relationships are captured through the individual coefficients of the difference terms. The 11 and 10 lags are included to perform the VECM for Jordan and Australia respectively. Table 6.5 shows the estimation of the VECM disequilibrium (refer Appendix A, Table A.1 and Table A.3).

Information obtain from the ECTs is related to the speed of adjustment of the system towards long-term equilibrium. The short-term dynamic relationships are captured through the individual coefficients of the difference terms. Table 6.5 presents the estimation of VECM. The adjustment coefficient of ECT of inward FDI inflows into Jordan and Australia is negatively significant at 1% level of significance indicating that, when deviating from the long-term equilibrium error, the correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of a long-term relationship between FDI flow, country risks, trade openness, stock market price and macroeconomic factors.

**Table 6.5: Vector Error Correction Model Results (FDI Jordan and Australia)**

Variable Jordan	FDI	FR	ER	PR	OP	IS	INF	INT
ECT(Coefficient)	-0.3963	-0.0020	-0.0006	0.0039	-0.2055	0.3136	-0.0039	0.0001
ECT (t-statistics)	-3.80***	-1.3845	-0.2364	1.9204*	-2.1125**	0.2884	-1.7523*	0.2376
R-squared	0.6457	0.4926	0.7757	0.4670	0.6595	0.6935	0.6061	0.6288
Adj- R-squared	0.2415	-0.086	0.5199	-0.1411	0.2710	0.3439	0.1567	0.2052
Variable Australia	FDI	FR	ER	PR	OP	IS	INF	INT
ECT(Coefficient)	-0.2013*	-0.1215	-0.2545*	-0.1385	-0.4660***	-0.0011*	0.66306	-0.5250*
ECT (t-statistics)	-1.7867*	-0.6780	-1.8036*	-0.95755	-5.501***	-1.771*	0.73682	-1.7585*
R-squared	0.6124	0.5997	0.6085	0.4687	0.7622	0.5103	0.4276	0.4959
Adj- R-squared	0.1703	0.1430	0.1619	-0.1374	0.4909	-0.0483	-0.2255	-0.0792

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

The ECT of inward FDI in Jordan is statistically significant and has a negative sign; their relative value -0.3963 [t statistic -3.80] denotes a satisfactory convergence rate to equilibrium. This suggests that the ECT at 0.3963 provides feedback into the short-term dynamic process from the previous periods at around 39%.

The ECT of inward FDI in Australia is significantly negative, which confirms that there is no problem in the long-term equilibrium relationship between the exogenous and endogenous variables. Their relative value -0.2013 [t statistic is -1.7867] suggests that the ECT at 0.2013 provides feedback into the short-term dynamic process from the previous periods at around 20 %.

The results of the ECT for Jordan's and Australia's country risks including financial health and economic health (negative for Jordan and Australia) and political stability (positive for Jordan and negative for Australia) as lagged endogenous variables, indicating the existence of a long-term equilibrium relationship between Jordan's

and Australia's country risks and inward FDI. More precisely, there is an insignificant existence of the speed adjustment towards equilibrium for Jordan's financial and economic health and for Australia's financial health and political stability. However, the ECT of Jordan's political stability -0.0039 [t-statistic 1.9204] suggests that the feedback into the short-term dynamic process from the previous period is around 0.39%. In other words, Jordan's political stability significantly is cointegrated with the behaviour of inward FDI in the long-term at 10% level of significance. The ECT of Australia's economic health (-0.2545) [t-statistic 1.8036] suggests that the feedback into the short-term dynamic process from the previous period is around 25 %. In other words, Australia's economic health significantly cointegrated with the behaviour of inward FDI in the long-term at 10% level.

Jordanian and Australian trade openness are significantly cointegrated with the flows of inward FDI in the long-term at the 5 % and 1% levels of significance respectively. The ECT of Jordan's trade openness, at 0.2055, [t-statistic 2.1125] suggests that feedback into the short-term dynamic process from the previous period is around 20%. The ECT of trade openness (at -0.4660) [t-statistic 5.501] suggests that the feedback into the short-term dynamic process from the previous period is around 46 %.

The results of ECT value for Jordan's stock market price and interest rate lagged endogenous variable have a positive sign, which is not significant, confirming the absence of a long-term equilibrium relationship for stock market price. This implies that the stock market price and interest rate are not cointegrated with inward FDI into Jordan. However, the results of ECT value for Australia's stock market lagged endogenous variable has a significant negative sign at 10% level, confirming the existence of a long-term equilibrium relationship for stock market price. The ECT of stock market price -0.0011 [t-statistic 1.771] suggests that the feedback into the short-term dynamic process from the previous period is 0.11 %; this implies that the stock market price is cointegrated with inward FDI into Australia.

Jordan's inflation significantly is cointegrated with the behaviour of inward FDI, in the long-term at the 10% level of significance. The ECT of inflation, 0.0039 [t-statistic 1.7523] suggests that the feedback into the short-term dynamic process from the previous period is around 0.39%. This indicates that trade openness and inflation

are cointegrated with inward FDI flows into Jordan. In contrast, the ECT for Australia's inflation lagged endogenous variable has a positive sign of the ECT, suggesting the absence of a long-term equilibrium relationship for inflation and inward FDI.

The result of ECT value for Jordan's interest rate lagged endogenous variable has an insignificant positive sign, confirming the absence of a long-term equilibrium relationship. This implies that the interest rate variable is not cointegrated with inward FDI. Nevertheless, the results of ECT value for Australia's interest rate lagged endogenous variable has negative signs and this is significant at 10% level, confirming the existence of long-term equilibrium relationship. The ECT of interest rate (-0.5250) [t-statistic 1.7585] suggests that the feedback into the short-term dynamic process from the previous period is around 52 %. This implies that the interest rate variable is cointegrated with inward FDI.

Table 6.5 also presents both the R-squared and adjusted R-squared, indicating the strong explanatory power of the models. In the case of Jordan, economic risk (ER) is ranked first, followed by trade openness (OP) and stock market price (IS). The specified model is ranked fourth in explanatory power. The political risk (PR) model has the lowest explanatory power. Comparing to Australia, trade openness (OP) is ranked first. The specified model is ranked second in explain the behaviour of other variables follow by economic health (ER) and financial health (FR). The inflation (INF) model shows the lowest explanatory power.

As concluded in the previous section (6.3.2), the presence of cointegration among the variables suggests that causality among the specified variables of the system exists in at least one direction, but does not delineate the direction of the causality. The statistical significance of the adjustment coefficients of these terms is examined in order to determine whether long-term equilibrium relationships drive the endogenous variables to convergence in equilibrium over time. Such testing of the adjustment coefficients is known as testing weak exogeneity of endogenous variables with respect to the parameters of the cointegrating equations. Table 6.6 presents the significance of zero restrictions on coefficients of cointegrated equations of the VECM.

**Table 6.6: Significance of Zero Restrictions on Coefficients of Cointegrated Equations of the VEC Model (FDI Jordan and Australia)**

Variable Jordan	FDI	FR	ER	PR	OP	IS	INF	INT
Chi-Square	2.8826	1.0417	33.4594	8.6448	7.1455	16.1234	5.7509	2.0482
Probability	0.0895	0.3074	00.0000	0.0032	0.0075	0.0000	0.0164	0.1523
Variable Australia	FDI	FR	ER	PR	OP	IS	INF	INT
Chi-Square	4.6574	0.4913	6.01601	0.9062	23.0908	2.3880	0.88163	4.5133
Probability	0.0309	0.4833	0.01417	0.3411	0.0000	0.1222	0.34775	0.0328

As most of the likelihood ratio (LR) tests reject the null hypothesis, the *ith* endogenous variable does not enter the cointegrating equations significantly. This implies that inward FDI in Jordan and Australia enters the cointegration relationships significantly at 10% level and 5% level respectively.

The null hypothesis of Jordanian and Australian financial health cannot be rejected. This indicates that it does not enter the cointegrating equations significantly. Jordanian and Australian economic health is accepted the alternative hypothesis at 1% level and 5% level of significance respectively. Further, Jordan's political stability accepts the alternative hypothesis at 1% level of significance.

Jordanian and Australian trade openness enters the cointegration relationship significantly at 1% level. Jordan's stock market price also enters significantly the cointegration relationship at 1%; however, Australia's stock market does not enter significantly the cointegration relationship.

Jordan's inflation rate accepts the alternative hypothesis by entering the cointegration relationship at the 10% level of significance. Australia's interest rate accepts the alternative hypothesis at %5 level of significance.

However, the null hypothesis of Jordanian interest rate and Australian inflation rate cannot be rejected. This indicates that they do not enter the cointegrating equations significantly.

In summary, the Johansen and Juselius approach and VCEM are applied to identify the speed of adjustment and capture long-term equilibrium relationships between inward FDI flows to Jordan, Australia and the specified variables. Further, the significance of zero restrictions is employed to capture the variables, which enter the cointegration equations significantly.

The Johansen and Juselius approach (Trace and  $\lambda_{\max}$  tests) indicate that there are eight and five cointegrating equations for Jordan and four and two cointegrating equations for Australia, both of which respectively are at a 1% level of significance. This implies that there is a possibility of causality between the specified variables in the system. The ECT confirms the existence of a long-term equilibrium relationship and the speed towards equilibrium. The following section discusses the short-term relationships implications.

#### **6.4. Short-Term Dynamic Movements (FDI Jordan and Australia)**

Having confirmed the existence of cointegration between specified variables in the system, Granger causality, impulse responses functions and variance decomposition are conducted based on VECM. These tests are undertaken in order to evaluate the short-term relationship among inward FDI flows to Jordan and Australia, country risks, trade openness, stock market price and macroeconomic factors.

##### **6.4.1 Granger Causality Test (FDI Jordan and Australia)**

The existence of cointegration implies Granger causality; however, cointegration results do not reveal the direction of causality, and therefore may provide even more useful information to the policy-makers. So, in order to identify the direction of Granger causality, VECM is applied. According to Granger (1988), when variables are cointegrated, a VECM should be estimated, rather than a VAR as in a standard Granger causality test.

This study examines the following questions: Do Jordan's and Australia's country risks (financial health, economic health and political stability) Granger cause inward FDI flows to Jordan's and Australia's economies? Does Jordan's and Australia's trade openness Granger cause inward FDI flows to Jordan's and Australia's economies? Does Jordan's stock market price Granger cause inward FDI flows to Jordan? Do Jordan's and Australia's macroeconomic factors (inflation and interest rate) Granger cause inward FDI flows to Jordan's and Australia's economies? Generally, the null hypothesis of a causality test is that there is no short-term relationship between the variables of interest in the system, and the alternative hypothesis is that there is a short-term relationship between the variables of interest

in the system. The results of the block exogeneity Wald test and Granger causality based on VECM are reported in Table 6.7.

**Table 6.7: Granger Causality/ Block Exogeneity Wald Test (FDI Jordan and Australia)**

Equations Jordan	FDI	FR	ER	PR	OP	IS	INF	INT
FDI		6.9793	9.1883	10.2278	28.4443***	5.2403	9.0841	8.8915
FR	32.4143***		17.2076	9.4053	12.115	12.8521	9.5724	24.1028**
ER	15.8775	20.9720		10.085	10.4530	25.0290***	13.9591	9.3945
PR	26.1740***	6.1254**	9.6798		4.9623	5.40771	10.1906	18.4623*
OP	24.2412**	3.5598	19.3683*	12.3298		15.9999	13.1435	4.5071
IS	14.0382	14.9016	106.2490***	12.4610	1.7654		14.5932	10.6655
INF	5.2748	10.1637	21.4237**	7.9341	9.9694	40.2957***		10.8472
INT	23.8983**	12.2111	17.5608*	10.5977	5.3454	4.65296	4.6696	
Joint	96.8335*	64.1973	245.6550***	63.3233	99.3958*	81.8987	65.5679	90.4894
Equations Australia	FDI	FR	ER	PR	OP	IS	INF	INT
FDI		3.5232	7.42763	4.3682	7.6921	7.42861	3.1575	6.4577
FR	5.49572		23.2813**	12.3353	9.5250	11.7571	8.5855	6.6651
ER	32.8510***	3.5532		14.0105	10.8704	6.5595	7.8556	9.6549
PR	10.5351	6.2497	11.9915		7.5318	9.0075	7.6851	1.4663
OP	19.1128*	6.1632	10.8134	8.1869		6.9208	3.9455	15.0478
IS	18.0316*	8.0521	19.1753*	10.1444	22.2578**		3.7492	9.7219
INF	7.4541	7.1447	12.6455	3.6894	3.5299	9.4673		25.4751***
INT	23.0240**	20.6861**	10.575	6.5163	4.7310	12.4325	12.2221	
Joint	109.1000***	40.5043	95.5747**	57.255	73.8150	52.3569	54.8153	66.0879

The Chi-square tests are reported in each cell with their associated p-value.

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

The null hypothesis of Granger causality test of Jordanian financial health is rejected, as the financial health Granger causes the inflow of inward FDI to Jordan's economy at 1 % level of significance. The Granger causality test accepts the alternative hypothesis; that is, political stability affects the short-term inward FDI flow into Jordan's economy at 1% level of significance. However, the null hypothesis of the Granger causality test of Australian financial health and political stability cannot be rejected, implying that the financial health and political stability do not Granger cause the inflows of inward FDI to the Australian economy. The alternative hypothesis of the Granger causality test of Australian economic health is

accepted, as the economic health Granger causes the inflows of inward FDI to the Australian economy at 1% level of significance. Comparing to Jordan's economic health, the null hypothesis cannot be rejected indicating that the economic health does not Granger cause inward FDI flows to Jordan.

The Granger causality results of Jordanian and Australian country risks suggest that the reverse causality is rejected since the Wald test statistics are insignificant. Therefore, there are uni-directional relationships between Jordan's financial health and political stability and Australia's economic health and inward FDI.

Granger causality runs from trade openness to the flows of inward FDI to Jordanian and Australian economies at 5% and 10% level of significance respectively. In terms of reverse causality, this is strong and runs from the flows of inward FDI to Jordanian trade openness at 1% level of significance. This indicates there is bi-directional Granger causality between inward FDI and trade openness.

The null hypothesis of Jordan's stock market price Granger causality cannot be rejected. This infers that there is no Granger causality between stock market price and inward FDI. Nevertheless, the null hypothesis of Australia's stock market price Grange causality is rejected. This indicates that there is Granger causality running from the stock market price to inward FDI. In terms of the reverse causality, there is no reverse Granger causality running from inward FDI to Australian stock market price. This reveals that there is uni-directional Granger causality between inward FDI and stock market price.

The results suggest no Granger causality running form Jordanian and Australian inflation rate to the flows of inward FDI and there is no reverse causality running from inward FDI to inflation rate. There is significant Granger causality running from Jordanian and Australian interest rate to inward FDI at 5% level. There is no evidence of reverse causality.

Evidence suggests that there is bi-directional causality running from the specified exogenous variables including country risks (financial health, economic health and political stability), trade openness, stock market price and macro-economic factors (inflation and interest rate) to the endogenous variable. This confirms indications of existing Granger causality among the specified variables in the system, according to

the ECT results in the previous section. Exogeneity test is applied to determine a weak and strong exogenous variable in the system. Table 6.8 presents results from the Weak Exogeneity Tests of the Endogenous for adjustment coefficients of the ECT for Jordan and Australia, which measure deviations from the long-term.

**Table 6.8 Weak Exogeneity Tests of the Endogenous: Variables in the VECM model (FDI Jordan and Australia)**

Variable Jordan	FR	ER	PR	OP	IS	INF	INT
Chi-Square	2.8776	2.8252	2.902727	8.2366	15.6541	2.905973	2.87983
Probability	0.0898	0.0927	0.0884	0.004105	0.0000	0.088252	0.089696
Variable Australia	FR	ER	PR	OP	IS	INF	INT
Chi-Square	4.6571	4.6586	4.6571	4.657479	4.7201	4.6577	4.6572
Probability	0.0309	0.0308	0.0309	0.030919	0.0298	0.0309	0.0309

All of the LR tests reject the null hypothesis that the *ith* endogenous variable are weakly exogenous with respect to the  $\beta$  parameters. This suggests that all of Jordan's and Australia's country risks (financial health, economic health and political stability) are strongly exogenous variables and significant at a %10 level and at a%5 of significance respectively. According to the LR tests, Jordan's and Australia's trade openness and stock market price are strongly exogenous at a 1% level and at a %5 level of significance in explaining the behaviour of inward FDI in Jordan and Australia respectively. Jordan's and Australia's macroeconomic environment (inflation and interest rate) is strong exogenous at a 10% level and at a %5 of significance. This confirms the Granger causality results that the specified variables in the system are strongly exogenous.

#### **6.4.2 Impulse Response Functions (FDI Jordan and Australia)**

The impulse response functions trace responses of other specified variables to one standard deviation shock to the specified endogenous inward FDI. The Cholesky order is considered to achieve robust results of impulse response functions (IRF). This study conducted impulse response functions (IRF) spanning 24 months to explore the relationship between exogenous and endogenous variables.

The IRF is presented graphically in Appendix A. Figure A.1 and Figure A.2 present the response of inward FDI flows to Jordan and Australia individually and respectively to one standard deviation innovation to Jordanian and Australian country risks, trade openness, stock market price and macroeconomic factors. The vertical axis of IRF

represents the variation in the variables' values and the horizontal axis of IRF represents the number of months after the standard error shock of variables, over the time span.

The results show that the shock and effect of Jordan's and Australia's financial health on inward FDI is significantly and positively over the 24 months. This implies that financial health has a uni-directional effect on inward FDI. Jordanian and Australian economic health have a significant and positive persistence effect on inward FDI over the 24 months. The response of inward FDI to one standard deviation impulse of Jordanian and Australian political stability is significantly positive and persistent over the 24 month period except for the fourth period.

The shock of one standard deviation of Jordanian and Australian trade openness on inward FDI is negative for the first three periods in Jordan and seventh and ninth months for Australia, after which time the response of inward FDI persists positively and significantly. The effect of one standard deviation of Jordanian and Australian shock of stock market on inward FDI is significant and positive. The shock of one standard deviation of Jordanian and Australian interest rate on inward FDI is significant though negative, for the 24 month period. Further, the response of inward FDI to one standard deviation of Jordanian and Australian inflation is negative during this period. Therefore, the results of IRF confirm the findings of the VECM in terms of ECT, suggesting that the speed of adjustment of inward FDI is significant and fast.

In summary, the study reveals that the findings of IRF add support to causal relationships the specified variables. There is a strong relationship between the specified variables behaviour in future periods. In general, the findings indicate that the shock of one standard deviation innovation has a major and persistent impact on inward FDI flows to Jordan and Australia, therefore, that the change in inward FDI behaviour and decisions in Jordan is influenced by long periods of time. Further, the findings of IRF affirm the findings of the Granger causality test VECM in terms of ECT; that is, stating that exogenous variables play a major role in determining inward FDI in Jordan and Australia. These findings are consistent with previous analysis, suggesting that country risks, trade openness, stock market and macro-economic factors are strongly exogenous variables in the system.

### **6.4.3 Variance Decomposition (FDI Jordan and Australia)**

Variance decomposition indicates the amount of information each variable contributes to the other variables in the VECM. It is used to aid interpretation of the VECM model, once it has been fitted and determine how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables. Further, variance decomposition offers a slightly different method for examining the VECM dynamic system. It provides the proportion of movements in the exogenous variables that are due to their own shock, as opposed to shocks to the other variables. Therefore, in this study, the Cholesky order method is used.

Appendix A (Table A.2 and A.4) present the forecast error variance decomposition for the inward FDI flows to Jordan and Australia over a 24-month period disequilibrium. The results of variance decomposition indicate that financial health, economic health, trade openness and inflation are relatively strong exogenous variables in explaining the behaviour of inward FDI flows into the Jordanian economy over the 24-month period. Comparing to Australia, economic health, trade openness, stock market price, inflation and interest rate are relatively strongly exogenous in explaining the behaviour of inward FDI flows to the Australian economy over 24 months.

The shock forecast error variance of Jordan's financial health explains 10.22% of the variance of inward FDI flows into Jordan. The results of forecast error variance decomposition suggest that almost 5.56% and 4.55% of changes in inward FDI come from Jordan's and Australia's economic health respectively. Trade openness explains almost 5.42% of the changes in the movements of inward FDI flows to Jordan and 6.72% of the changes in the movements of inward FDI flows to Australia. The shock of forecast error variance of inflation explains 10.19% and 7.3% of movements of inward FDI flows into Jordan's and Australia economy respectively. This implies that the variance decomposition results support the findings of the Granger causality test and VECM in terms of ECT. The stock market price accounts for almost 5.48% of the changes in the movements of inward FDI flows to Australia. The shock forecast error variance of Australian interest rate explains 11.08% of the variance of inward FDI flows to Australia.

In summary, Granger causality, impulse responses function and variance decomposition tests are conducted based on VECM to examine short-term between the specified variables. The Granger causality test based on VECM indicates that there are Granger causalities running from the Jordan's exogenous variables including financial health, political stability, trade openness and interest rate to the endogenous variables. In case of Australia, Granger causalities running from economic health, trade openness, stock market price and interest rate to the endogenous variables. The results of IRF confirm the outcomes of the Johansen cointegration test and Granger causality test of VECM in terms of ECT and indicate that exogenous variables play a major role in determining inward FDI in Jordan and Australia. The findings, therefore, indicate that the shock of one standard deviation innovation has a major and persistent impact on inward FDI flows to Jordan and Australia, suggesting that change in inward FDI behaviour and decisions in Jordan is influenced by long periods of time. The results of variance decomposition support the above methods findings.

### **6.5 Determinants of Inward Foreign Indirect Investment (FII) into Jordan and Australia**

The process of determining inward FII flows into Jordan and Australia consisted of five steps. The first step established the order of integration of the series under consideration by implementing unit root tests, such as ADF and PP. The second step tests for long-term relationship and cointegration by employing Johansen and Juselius (1990) approach after confirming that variables are integrated of the same order. The third step is tested for short-term relationships and speed of adjustment for error correction terms, applying VECM. The fourth step is tested for Granger causality in a multivariate VECM framework. The fifth step is utilised impulse response function and variance decompositions and analysis.

### **6.5.1 Integration (FII Jordan and Australia)**

The results of ADF and PP confirm that FII, country risks, trade openness, macroeconomic factors and errors are time-dependent (refer Table 6.1). First differencing removes time dependency in the data, that is, at first the differenced specified variables and errors of these relationships are stationary and integrated in the first order ( $I(1)$ ). Hence, the study confirms an integrated non-stationary process leaving the path free to specify a vector autoregressive VAR model and test for long-term relationship and cointegration using the Johansen and Juselius (1990) approach. Exogeneity and short-term relationships are tested using vector error correction model (VECM) and Granger's (1988) causality test; confirming results by impulse responses function and variance decomposition analysis. The next sub-section presents the testing of long-term relationships among specified variables by using Johansen and Juselius (1990) approach in a multivariate framework.

### **6.6 Long-Term Equilibrium Relationship (FII Jordan and Australia)**

Since the variables the specified variables are integrated in the first order ( $I(1)$ ), this implies they may have a long-term equilibrium relationship, from which they may deviate in the short-term, however, the relationships will be returned to in the long-term. Several steps are used to detect the long-term equilibrium relationships as follows: The VAR model is specified in level series and tested for stability. The optimal lag is determined by the use of information criteria. A cointegration test is applied, if cointegration is proven the model is respecified into a VECM with the lag determined by the VAR information criteria to confirm the existence of the long-term equilibrium by the use of Johansen cointegration test.

#### **6.6.1 Vector Autoregressive Model (FII Jordan and Australia)**

The Vector Autoregressive (VAR) model has in fact the advantage of treating each variable under study as an endogenous variable when economic theory cannot offer a priori information regarding the variables used in the VAR (Gujarati, 1995). Since lag length is determined, the VAR model is applied to capture the long-term relationship amongst exogenous and endogenous variables. Table 6.9 presents R-squared and adjusted R-squared of VAR model.

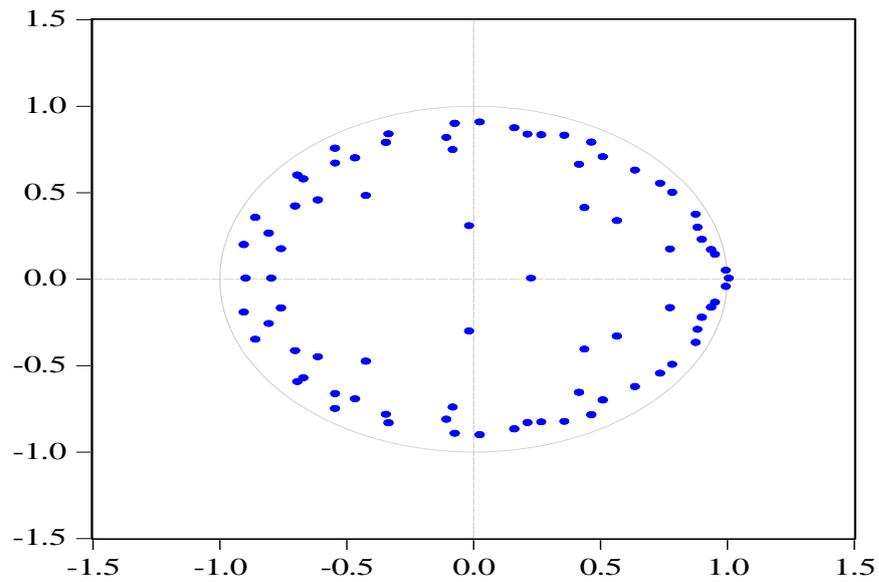
**Table 6.9: Vector Autoregressive Results (FII Jordan and Australia)**

Variable Jordan	FII	FR	ER	PR	OP	IS	INF	INT
<b>R-squared</b>	0.9342	0.93458	0.9764	0.9204	0.9875	0.2101	0.99813	0.9932
<b>Adjusted R-squared</b>	0.8751	0.87577	0.9552	0.8489	0.9764	-0.4998	0.99645	0.9871
Variable Australia	FII	FR	ER	PR	OP	IS	INF	INT
<b>R-squared</b>	0.8437	0.9428	0.9361	0.8678	0.8071	0.9708	0.9396	0.9713
<b>Adjusted R-squared</b>	0.7033	0.8914	0.8788	0.7490	0.6337	0.9447	0.8854	0.9455

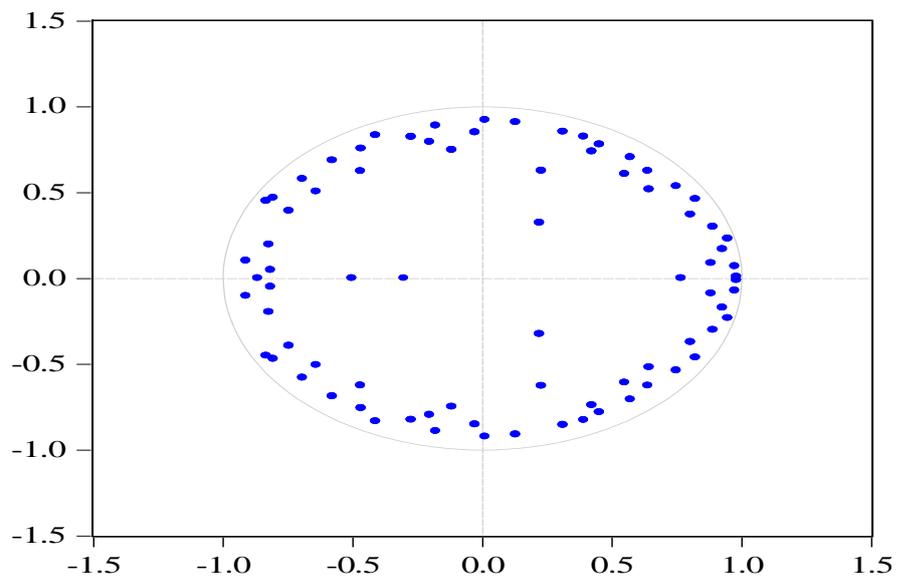
In relation to the specified model, the results show that the R-squared value is 0.93. In other words, the exogenous variables including Jordan's country risk, trade openness and macroeconomic factors explain 0.93 of the behaviour of inward FII. Therefore, the VAR model is a good fit for examining inward FII. Figure 7.3 shows the VAR model stability conditions. Since no root is lying outside the unit circle, the VAR model is deemed to be stable.

In relation to the specified model, the results showed that the Adjusted R-squared value is 0.8751, comparing to Australia's VAR model the R-squared is 0.7033. In other words, the exogenous variables including Jordan's and Australia's country factors (financial and economic health and political stability), trade openness, stock market price and macroeconomic factors (inflation and interest rate) explain 0.8751 and 0.7033 of the behaviour of inward FII in Jordan and Australia, respectively. Therefore, the VAR model is a good fit for examining inward FII. Figure 6.10 shows Jordan's VAR model stability conditions.

**Figure 6.3: Inverse Roots of VAR Characteristic Polynomial (FII Jordan)**



**Figure 6.4: Inverse Roots of VAR Characteristic Polynomial (FII Australia)**



Since no root lies outside the unit circle, the VAR model is deemed to be stable. Figure 6.3 shows that Jordan's VAR model is stable the same as in Australia in Figure 6.4. Table (6.10) presents results of VAR lag order selection criteria for three tests of specified variables.

**Table 6.10 VAR Lag Length Order Selection Criteria (FII Jordan and Australia)**

Lag Jordan	LogL	LR	FPE	AIC	SC	HQ
0	-9173.6760	NA	1.4300	109.3295	109.5154*	109.4049
1	-8994.3450	335.1780	5.5900*	108.3851	110.4305	109.2152*
2	-8896.2160	171.7262	5.7800	108.4073	112.3123	109.9921
3	-8807.2140	145.1577	6.7800	108.5383	114.3027	110.8778
4	-8737.3290	105.6592	1.0300	108.8968	116.5207	111.9909
5	-8635.5120	141.8170	1.1100	108.8751	118.3586	112.7240
6	-8556.4390	100.7232	1.6500	109.1243	120.4672	113.7278
7	-8450.3110	122.5527	1.9100	109.0513	122.2538	114.4095
8	-8346.7220	107.2892	2.4900	109.0086	124.0706	115.1215
9	-8252.7020	86.1849	4.0900	109.0798	126.0013	115.9473
10	-8143.5480	87.0630	6.5400	108.9708	127.7518	116.5930
11	-7932.6550	143.1061*	3.8500	107.6507*	128.2911	116.0276

Lag Australia	LogL	LR	FPE	AIC	SC	HQ
0	-9343.2900	NA	2.9100	110.0387	110.2232	110.1136
1	-7648.3500	3170.538	2.0700	91.2746	93.3037*	92.0980*
2	-7552.9400	167.2477	2.2100	91.3286	95.2023	92.9005
3	-7414.8900	225.7523	1.4500*	90.8810	96.5992	93.2014
4	-7315.4900	150.8491	1.5500	90.8881	98.4509	93.9570
5	-7209.2200	148.7756	1.5800	90.8144	100.2218	94.6318
6	-7124.5000	108.648	2.1800	90.9941	102.2461	95.5600
7	-7002.0500	142.6116	2.0700	90.7300	103.8266	96.0444
8	-6898.7900	108.1252	2.6700	90.6916	105.6328	96.7545
9	-6775.0600	114.9994	3.0300	90.4121	107.1982	97.2238
10	-6590.8400	149.5392*	1.9600	89.4216*	108.0520	96.9816

\*Indicates lag order selected by the criterion. LR: sequential modified LR test statistic (each test at 5% level),  
 FPE: Final prediction error.  
 AIC: Akaike information criterion.  
 SC: Schwarz information criterion.  
 HQ: Hannan-Quinn information criterion.

Table 6.10 show the maximum possible lag length of Jordan and Australia. The first column provides the lag length for each test and the last three columns of the table illustrate the test statistics. In this case, the choice is ambiguous because apparently only one lag is needed by the SC and HQ, 11 lags with the AIC for Jordan and 10 lags for Australia. Further examination found serial correlation at one lag. Therefore, the 11 lags length of VAR is selected for Jordan and 10 lags for Australia by AIC information criterion, since they are not serially correlated.

## 6.6.2 Cointegration Test (FII Jordan and Australia)

The study conducts cointegration test to explore the dynamic movement of inward FII in long-term equilibrium relationship with Jordan country risks, trade openness, stock market price and macroeconomic factors. Having established the time series properties of the data, the test for the presence of a long-term equilibrium relationship between variables using the Johansen and Juselius (1990) approach is conducted.

The results of  $\lambda_{\text{trace}}$  and  $\lambda_{\text{max}}$  tests for Jordan and Australia are reported in Table 6.11 and suggest that the null hypothesis of no cointegrating vectors can be rejected at the 1% level of significance. More precisely, Table 6.11 shows that the Trace and Max. tests accepted the alternative hypothesis of existing long-term cointegration relationships.

**Table 6.11: Johansen Cointegration Analysis of Unrestricted Cointegration Rank of Trace and Max.-Eigen Test (FII Jordan and Australia)**

Hypothesized No of CE(s) Jordan	Eigenvalue	Trace Statistic	0.05 Critical Value	Max.-Eigen Statistics	0.05 Critical Value
None	0.3363	242.1347***	159.5297	69.2827***	52.3626
At most 1	0.2460	172.8520***	125.6154	47.7318**	46.2314
At most 2	0.2064	125.1202***	95.7536	39.0889**	40.0775
At most 3	0.1623	86.0311***	69.8188	29.9334	33.8768
At most 4	0.1264	56.0977***	47.8561	22.8512	27.5843
At most 5	0.0820	33.2465**	29.7970	14.4641	21.1316
At most 6	0.0671	18.7823**	15.4947	11.7386	14.2646
At most 7	0.0408	7.0437***	3.8414	7.04373***	3.84146
Hypothesized No of CE(s) Australia	Eigenvalue	Trace Statistic	0.05 Critical Value	Max.-Eigen Statistics	0.05 Critical Value
None	0.3560	257.2397***	159.5297	74.3932***	52.3626
At most 1	0.3127	182.8465***	125.6154	63.3919***	46.2314
At most 2	0.2531	119.4545***	95.7536	49.3261***	40.0775
At most 3	0.1901	70.1284**	69.8188	35.6426*	33.8768
At most 4	0.1079	34.4857	47.8561	19.3023	27.5843
At most 5	0.0533	15.1833	29.7970	9.2595	21.1316
At most 6	0.0336	5.9238	15.4947	5.7808	14.2646
At most 7	8.4604	0.1429	3.8414	0.1429	3.8414

Trace and Max.-eigenvalue testes indicate 8 and 2 cointegrating equations for Jordan and 4 and 4 cointegrating equations for Australia respectively at the 0.05 level,

\* denotes rejection of the hypothesis at the 0.05 level,

\*\*MacKinnon-Haug-Michelis (1999) p-values.

\*\*\*indicate statistical significant at 1% level

Since the calculated Trace (172.8520) is above the critical values (125.6154) at 1% level, it can clearly reject the null hypothesis of no cointegration between inward FII in Jordan and specified variables, at most 2. The alternative hypothesis is accepted at 1% significant level as the Trace statistic (125.1202) is greater than the critical value (95.7536). The null hypothesis, at most 3, is rejected as the Trace statistic (86.0311) above the critical value (69.8188). The alternative hypothesis, at most 4, is accepted at 1% significant level as the Trace statistic (56.0977) is greater than the critical value (47.8561), at most 5 the Trace statistic (33.2465) is greater than the critical value (29.7970), meaning that there is significant cointegration at 1% level, the null hypothesis, at most 6, is rejected at 1% level of significance as the Trace statistic (18.7823) is greater than the critical value (15.4947). Finally, at most 7, the alternative cannot be rejected at 1% level of significance as the Trace statistic (7.0437) is above the critical value (3.8414).

Further, Table 6.11 shows that the  $\lambda_{\max}$ . test accepts the alternative hypothesis of existing long-term cointegration relationship between inward FII in Jordan, country risks, trade openness, stock market price and macroeconomic environment. Since the calculated  $\lambda_{\max}$ . (47.7318) is above the critical values (46.2314) at 1 level. The null hypothesis of no cointegration can be clearly acc, at most 2 as the  $\lambda_{\max}$ . statistic (39.0889) is smaller than the critical value (40.0775). The null hypothesis of no cointegration between inward FII in Jordan and specified variables at most 3, 4, 5, 6 and 7 is accepted as the  $\lambda_{\max}$ . statistic value is less than the critical value.

Table 6.11 shows also the Trace test accepts the alternative hypothesis of existing long-term cointegration relationship between Australia's specified. Since the Trace statistic (119.4545) is greater than the critical value (95.7536), at most 2, the alternative hypothesis is accepted at 1% significant level. The null hypothesis, at most 3, is rejected as the Trace statistic (70.1284) is above the critical value (69.8188) at 5% level of significance. The alternative hypothesis, at most 4, 5, 6 and 7 cannot be accepted as the Trace statistic value is less than the critical value, indicating no cointegration relationships between the specified variables in the system.

In addition, Table 6.11 shows that the  $\lambda_{\max}$ . test accepts the alternative hypothesis of an existing long-term cointegration relationship. Since the calculated  $\lambda_{\max}$ .

(63.3919) is above the critical values (46.2314) at 1 level, the null hypothesis of no cointegration can be clearly rejected, at most 2. The alternative hypothesis is accepted at 1% significant level as the  $\lambda_{\max}$ . statistic (49.3261) is greater than the critical value (40.0775). The alternative hypothesis, at most 3, is accepted at 10% level of significance, as the  $\lambda_{\max}$ . statistic (35.6426) is above the critical value (33.8768). The alternative hypothesis, at most 4, 5, 6 and 7 is rejected as the  $\lambda_{\max}$ . statistic value is less than the critical value.

Therefore, the Trace and  $\lambda_{\max}$ . tests indicate that there are 8 and 2 cointegrating equations respectively at 1% level of significance. In other words, the specified variables have long-term equilibrium. This indicates that there is the possibility of causality between inward FII flows into Jordan, country risk, trade openness, stock market price and macroeconomic factors. Therefore, the ECM is implemented to investigate the speed of adjustment of inward FII and its determinants.

### **6.6.3 The Speed of Adjustment Error Correction Terms (FII Jordan and Australia)**

Having confirmed the VAR the optimal lag and existence of the long-term equilibrium relationship between inward FII in Jordan and Australia and their country risks, trade openness, stock market price and macro-economic environment, the VECM is applied in order to test the long-term equilibrium and evaluate the short-term properties of the cointegrated series. The coefficients of ECTs contain information about whether the past values affect the current values of the specified variables. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes.

The information obtain from the ECT is related to the speed of adjustment of the system towards long-term equilibrium. The short-term dynamics are captured through the individual coefficients of the difference terms. The 11 and 10 lags were included to perform the VECM for Jordan and Australia respectively.

Table 6.12 shows the estimation of VECM disequilibrium (refer Appendix B Table B.1 and Table B.3). The adjustment coefficient on ECT of inward FII inflows into Jordan and Australia is negative and statistically significant at 10% level of significance indicating that, when deviating from the long-term equilibrium error

correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of long-term relationship between FII flows, country risks, trade openness, stock market price and macroeconomic factors.

**Table 6.12: Vector Error Correction Model Results (FII Jordan and Australia)**

Variable Jordan	FII	FR	ER	PR	OP	IS	INF	INT
ECT (Coefficient)	-0.0443*	-0.01200	-0.02780***	-0.3120	-0.0020	0.0053***	0.7760	-0.1560*
ECT (t-statistics)	-1.7567*	-0.3473	-4.930***	-0.7053	-01.835	2.4109***	1.3559	-1.8050*
R-squared	0.6176	0.5119	0.7577	0.4643	0.6034	0.6625	0.6003	0.6421
Adj- R-squared	0.1465	0.0122	0.5096	-0.0841	0.1974	0.3170	0.1911	0.2756
Variable Australia	FII	FR	ER	PR	OP	IS	INF	INT
ECT (Coefficient)	-0.6100*	-0.9850*	-0.1090	-0.1630*	-0.34***	-0.89805*	0.7600*	-0.5950
ECT (t-statistics)	-1.7653*	-1.7506*	-1.0515	-1.9119*	-7.27***	-1.8072*	1.7527*	-0.2472
R-squared	0.5744	0.6322	0.6021	0.4986	0.8039	0.5550	0.4670	0.5526
Adj- R-squared	0.0307	0.2127	0.1482	-0.0734	0.5801	0.0473	-0.1410	0.0421

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

The ECT of inward FII into Jordan is statistically significant and has a negative sign. Their relative value -0.0443 [t statistic -1.7567] denotes a satisfactory convergence rate to equilibrium point. This suggests that the ECT -0.04437 provides feedback to the short-term dynamic process from the previous periods at 4.43 %.

The ECT of inward FII in Australia is significantly negative, which confirms that there is no problem in the long-term equilibrium relationship between the exogenous and endogenous variables. Their relative value -0.6100 [t statistic -1.7665] suggests that the ECT -0.6100 provides feedback into the short-term dynamic process from the previous periods at 61 %.

The results of the ECT for Jordan's country risks including financial health and political stability lagged endogenous variables have insignificant negative sign of the ECT, but economic health has significant negative sign indicating the existence of a long-term equilibrium relationship with inward FII. The ECT of Jordan's economic health -0.02780 [t statistic -4.930] suggests that the feedback into the short-term dynamic process from the previous period is 2.78%. In other words, Jordan's economic health significantly is cointegrated with the behaviour of inward FII in the long-term at 1% level of significance.

Australia negative ECTs confirm the long-term equilibrium relationship between inward FII, financial health and political stability at 10% level of significance. There is an insignificant existence of the speed adjustment of Australia's economic health. However, The ECT of Australia's financial health and political stability -0.9850 [t statistic -1.7506] and -0.1630 [t statistic -1.9119], respectively, suggests that the feedback into the short-term dynamic process from the previous period is 98 % from financial health and 16% political stability. In other words, Australia's financial health and political stability significantly are cointegrated with the behaviour of inward FII in the long-term at 10% level.

There is an insignificant existence of the speed adjustment of Jordan's trade openness towards equilibrium. However, Australia's trade openness significantly is cointegrated with the behaviour of inward FII, in the long-term at 1 % level of significance. The ECT of Australian trade openness, at -0.34 [t statistic -7.27], suggests that feedback into the short-term dynamic process from the previous period is 34%. This indicates that trade openness is cointegrated with inward FII flows into Jordan.

The results of ECT value for Jordan's and Australia's stock market price lagged endogenous variable has a significant negative sign, confirming that the long-term equilibrium relationship between inward FII and stock market price. The ECT of Jordan's stock market price, at 0.0053 [t statistic 2.4109], suggests that feedback into the short-term dynamic process from the previous period is 0.53%. The feedback into the short-term dynamic process from the Australia's stock market previous period is 89%. This implies that the stock market price is cointegrated with inward FII into Jordan and Australia.

There is an insignificant existence of the speed adjustment of Jordanian inflation rate and Australian interest rate towards equilibrium. This implies that the Jordan's inflation rate and Australia's interest rate are not cointegrated with the flows of inward FII into Jordan and Australia. However, the ECT for Jordan's interest rate and Australia's inflation rate lagged endogenous variables has a significant negative sign, confirming that the long-term equilibrium relationship between inward FII and Jordan's interest rate and Australia's inflation rate. Further, the ECT of Jordan's interest rate, at -0.1560 [t statistic -1.8050], and Australia's inflation rate, 0.7600 [t

statistic 1.7527], suggest that feedback into the short-term dynamic process from the previous period are 15% and 46%, respectively.

Table 6.12 also presents both the R-squared and adjusted R-squared, indicating the strong explanatory power of the endogenous variable models. In case of Jordan, Economic risk (ER) is ranked first in explaining the behaviour of other variables, followed by stock market price (IS) and interest rate (INT). The specified model is ranked fourth in accounting for the behaviour of other variables. The political risk (PR) model has the lowest explanatory power. Comparing to Australia, Trade openness (OP) is ranked first in explaining other variables' behaviour; followed by financial health (FR) and economic health (ER). The specified model is ranked fourth in accounting for the behaviour of other variables; the inflation (INF) model has the lowest explanatory power.

As concluded in the previous Section, the presence of cointegration among the variables suggests that causality among the specified variables of the system exists in at least one direction, but does not delineate the direction of the causality. The statistical significance of the adjustment coefficients of these terms is examined to ascertain whether the long-term equilibrium relationships drive the endogenous variables to convergence to equilibrium over time. Such testing of the adjustment coefficients is known as testing the weak exogeneity of the endogenous variables with respect to the parameters of the cointegrating equations. Table 6.13 shows the significance of zero restrictions on coefficients of co-integrated equations of the VECM.

**Table 6.13: Significance of Zero Restrictions on Coefficients of Cointegrated Equations of the VEC Model (FII Jordan and Australia)**

Variable Jordan	FII	FR	ER	PR	OP	IS	INF	INT
Chi-Square	3.0746	0.1466	18.377	0.6115	6.0096	6.5094	1.8593	6.2747
Probability	0.0795	0.7017	0.00001	0.4342	0.0149	0.0107	0.1726	0.0914
Variable Australia	FII	FR	ER	PR	OP	IS	INF	INT
Chi-Square	8.4546	1.8058	11.0310	5.2368	6.2589	14.5188	4.5366	0.2976
Probability	0.0036	0.1790	0.00089	0.0147	0.0123	0.00013	0.0331	0.5853

As most of the LR tests reject the null hypothesis that the *ith* endogenous variable does not enter the cointegrating equations significantly. This implies that the inward FII in Jordan and Australia enters the cointegration relationships significantly at 10% level respectively. The null hypothesis of Jordanian and Australian financial health cannot be rejected. This indicates that it does not enter the cointegrating equations significantly. Jordan's and Australia's economic health accepted the alternative hypothesis at 1% level of significance and Australia's political stability enters the cointegration relationship significantly at 10% level.

Jordan's and Australia's trade openness and stock market price accept the alternative hypothesis of entering the cointegration relationship at 10% level of significance and at 1% level of significant for Australia's stock market.

Jordan's interest rate accepts the alternative hypothesis by entering the cointegration relationship at 10% level of significance. Australia's inflation rate accepts the alternative hypothesis at 10% level of significance. However, the null hypothesis of Jordanian inflation rate and Australian interest rate cannot be rejected. This indicates that they do not enter the cointegrating equations significantly.

In summary, the Johansen and Juselius methods and VECM model are applied to capture the long-term equilibrium relationships between inward FII flows to Jordan and Australia and their specified variables. Further, a significance of zero restrictions is employed to capture the significant entrance the cointegration relationship. The Johansen and Juselius approach (Trace and  $\lambda_{\max}$  tests) indicate that there are eight and two cointegrating equations for Jordan and four cointegrating equations for Australia, both of which respectively are at 1% level of significance. This implies that there is the possibility of causality between the specified variables in the system. The ECTs confirm the existence of a long-term equilibrium relationship and the speed towards equilibrium. The following section discusses the short-term relationships implications.

## **6.7 Short-Term Dynamic Movements (FII Jordan and Australia)**

Having confirmed the existence of cointegration between specified variables in the system, the Granger causality, impulse responses function and variance decomposition are conducted based on VECM in order to evaluate the short-term relationship among the specified variables.

### **6.7.1 Granger Causality Test (FII Jordan and Australia)**

The existence of cointegration implies Granger causality, but cointegration results do not reveal the direction of the causality, which may provide even more useful information to the policy-makers. In order to identify the direction of Granger causality, VECM is applied. According to Granger (1988), when variables are cointegrated, a VECM should be estimated rather than a VAR as in a standard Granger causality test.

This study examines the following questions: Do Jordan's and Australia's country risks (financial health, economic health and political stability) Granger cause inward FII flows to Jordan's and Australia's economies? Does Jordan's and Australia's trade openness Granger cause inward FII flows to Jordan's and Australia's economies? Does Jordan's stock market price Granger cause inward FII flows to Jordan? Do Jordan's and Australia's macroeconomic factors (inflation and interest rate) Granger cause inward FII flows to Jordan's and Australia's economies? Generally, the null hypothesis of a causality test is that there is no short-term relationship between the variables of interest in the system, and the alternative hypothesis is that there is a short-term relationship between the variables of interest in the system. The results of the block exogeneity Wald test Granger causality based on VECM are reported in Table 6.14.

**Table 6.14: Granger Causality/ Block Exogeneity Wald Test  
(FII Jordan and Australia)**

Equations Jordan	FII	FR	ER	PR	OP	IS	INF	INT
<b>FII</b>		3.13253	9.23274	8.97431	9.03938	53.5671***	43.4670***	4.47926
<b>FR</b>	2.1592		9.72102	10.5800	2.68087	25.4763	9.18885	20.1699*
<b>ER</b>	18.75082*	10.156		10.8533	8.45813	39.3976***	17.8895*	5.7161
<b>PR</b>	8.84713	2.41928	4.12377		6.3200	11.9635	7.65447	11.8941
<b>OP</b>	22.6406**	2.9704	6.96263	9.62110		78.6584***	21.4933**	9.6502
<b>IS</b>	19.7730*	9.06452	88.0062***	8.57382	12.7489		27.3990**	5.00597
<b>INF</b>	39.6015***	6.47977	13.4215	9.57722	20.1251*	90.2191***		5.02029
<b>INT</b>	4.18532	13.056	9.29236	13.4898	3.89957	10.9678	6.86759	
<b>Joint</b>	99.3361*	48.7300	180.577***	51.9965	35.0931	232.728***	103.361**	67.9502
Equations Australia	FII	FR	ER	PR	OP	IS	INF	INT
<b>FII</b>		7.11252	6.51651	5.14122	10.5604	32.3045***	6.99127	13.1176
<b>FR</b>	34.5986***		16.1351*	11.8401	8.52566	8.71023	7.81584	4.70605
<b>ER</b>	14.0266	2.28004		12.3911	10.7457	6.24281	6.61652	9.58032
<b>PR</b>	16.7254*	6.21933	11.8839		9.5330	9.79006	6.58313	3.10476
<b>OP</b>	16.2959*	8.2914	9.45357	7.11664		8.74798	4.83869	14.2083
<b>IS</b>	19.9080*	7.56880	17.864*	11.343	26.3342**		3.27548	9.79488
<b>INF</b>	18.1110*	11.5418	8.83439	4.17386	5.08385	12.6567		21.9110*
<b>INT</b>	7.83010	10.8835	10.3980	4.56526	3.39520	16.6653*	11.4549	
<b>Joint</b>	126.989***	56.0497	93.8307*	58.466	78.6446	88.8231*	60.7980	76.9081

The Chi-square tests are reported in each cell with their associated p-value.

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

The null hypothesis of the Granger causality test of Jordanian financial health is accepted, as the financial health Granger does not cause the inflows of inward FII to Jordan economy. However, the null hypothesis of Jordanian economic health is rejected, indicating that the economic health Granger causes inward FII flows to Jordan at 10% level of significance. However, the Granger causality test accepts the null hypothesis of political stability; as the political stability does not Granger cause the inflows of inward FII into the Jordan economy in the short-term.

the null hypothesis of Australian financial health is rejected indicating that the financial health Granger cause inward FII flows to Australian at 1% level of significance. However, the null hypothesis of Granger causality test of Australian economic health is accepted as the economic health Granger does not the inflows of

inward FII to Australian economy. The Granger causality test accepts the alternative hypothesis of political stability, as the political stability does Granger-cause the inflows of inward FII in the short-term into the Australian economy at 10% level of significance.

The Granger causality results of Jordanian and Australian country risks suggest that the reverse hypothesis is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional causality between economic health and inward FII.

Granger causality runs from the trade openness to the flows of inward FII to Jordanian and Australian economies at 5% and 10% levels of significance respectively. In terms of the reverse causality, the Granger causality results of trade openness suggest that the reverse hypothesis is rejected for both Jordan and Australia since the Wald test statistics are insignificant. This implies that there is uni-directional causality between trade openness and inward FII. Nevertheless, the null hypothesis of stock market price Grange causality is rejected for both Jordan and Australia. This infers that there is Granger causality running from the stock market price to inward FII. The reverse causality of stock market price cannot be rejected at 1% level of significance. This suggests that there is strong bi-directional Granger causality between inward FII in Jordan, Australia and their stock market price.

The results of Granger causality suggest that there is Granger causality running from Jordan's and Australia's inflation rate to the flows of inward FII. In terms of the reverse causality, there is strong reverse Grangers causality running from the inward FII in Jordan to inflation rate. In the short-term Grange causality, the null hypothesis of interest rate is accepted for both countries, indicating that there is no Granger causality direction from the interest rate to inward FII. The reverse causality of interest rate is rejected. This suggests that there is no bi-directional Granger causality. Table 6.15 presents results from the Weak Exogeneity Tests of the Endogenous for adjustment coefficients of the ECT for Jordan and Australia, which measure deviations from the long-term.

**Table 6.15 Weak Exogeneity Tests of the Endogenous Variables in the VEC model (FII Jordan and Australia)**

Variable Jordan	FR	ER	PR	OP	IS	INF	INT
Chi-Square	3.0745	3.0707	3.0750	2.8227	3.8002	3.0762	3.0748
Probability	0.0795	0.0797	0.0795	0.0929	0.0512	0.0794	0.0795
Variable Australia	FR	ER	PR	OP	IS	INF	INT
Chi-Square	8.4563	8.4527	8.4551	8.4546	8.3283	8.4555	8.4549
Probability	0.0036	0.0036	0.0036	0.0036	0.0039	0.0036	0.0036

All of the LR tests reject the null hypothesis that the *ith* endogenous variable are weakly exogenous with respect to the  $\beta$  parameters. This suggests that all of Jordan's and Australia's country risks (financial health, economic health and political stability) are strongly exogenous variables and significant at a %10 level and at a%1 of significance respectively. According to the LR tests, Jordan's and Australia's trade openness and stock market price are strongly exogenous at a 10% level and at a %5 level of significance in explaining the behaviour of inward FII in Jordan and Australia respectively. Jordan's and Australia's macroeconomic environment (inflation and interest rate) is strong exogenous at a 10% level and at a %5 of significance. This confirms the Granger causality results that the specified variables in the system are strongly exogenous.

### **6.7.2 Impulse Response Functions (FII Jordan and Australia)**

The impulse response functions trace effect and impulse of an exogenous variable's one-time shock to one of the innovations on current and future values of endogenous variable. The Cholesky order is considered to achieve robust results of IRF. This study conducted IRF over a 24-month period to explore the short-term relationship between exogenous and endogenous variables.

The IRF is presented graphically in Appendix B (Figure B.1 and Figure B.2) present the response of inward FII flows in Jordan to one standard deviation innovation in relation to Jordanian and Australian country risks, trade openness, stock market price and macro-economic factors. The vertical axis of IRF represents the variation in the variables values and the horizontal axis of IRF represents the number of months after the standard error shock of variables over the period.

The shock of Jordan's financial health on inward FII is negative for the first three months, but it persists positively after five months. This implies that financial health has a bi-directional effect on inward FII. Jordan's economic health has a negative impulse on inward FII over a 7-month period, but the shock becomes positive after 7 months and moves to its equilibrium. The response of inward FII to one standard deviation shock of Jordan's political stability is positive and persistent over the 24-month period except for the fourth period. However, the shock of one standard deviation of Australian's financial health on inward FII is positive over 24 months. This implies that financial health has a uni-directional effect on inward FII. Australia's economic health has a significant positive impact on inward FII over 24 months. The response of inward FII to one standard deviation shock of Australian's political stability is a positive and significant over the 24-month period.

The shock of one standard deviation of trade openness on inward FII flows to Jordan is negative for the first and second months, and then the response of inward FII becomes positive and persistent. The shock of one standard deviation of trade openness on inward FII flows to Australia is negative during month 6 and month 9, but it is persistent positively after the tenth month. The effect of Jordan's and Australia's market price on inward FII is positive and over the 24 months.

The response of inward FII to one standard deviation of Jordanian and Australian inflation is negative over the 24-month period. Further, the shock of one standard deviation of Jordanian and Australian interest rate on inward FII is negative over 24 months. Therefore, the results of IRF confirm the findings of the VECM in terms of ECT, suggesting that the speed of adjustment of inward FII is significant and fast.

In summary, this study's findings of IRF confirm the outcomes of the Johansen cointegration test and VECM. This implies that there is a relationship between inward FII behaviour in Jordan and Australia and the specified variables behaviour in future periods. In general, the findings indicate that the shock of one standard deviation innovation has a major and persistent impact on inward FII flows to Jordan, suggesting that the changing of inward FII behaviour and making decision in Jordan and Australia is influenced by long periods of time. Also, the findings of IRF affirm the findings of the Granger causality test VECM in terms of ECT, stating that exogenous variables play a major role in determining inward FII in Jordan.

Therefore, the findings are consistent with previous analysis, suggesting that country risks, trade openness, stock market and macro-economic factors are strongly exogenous variables in the system.

### **6.7.3 Variance Decomposition (FII Jordan and Australia)**

Variance decomposition indicates the amount of information each variable contributes to the other variables in the VECM. It is used to aid interpretation of the VECM model, once it has been fitted and determine how much of the forecast error variance of each of the variables can be explained by exogenous shocks to the other variables. Further, variance decomposition offers a slightly different method for examining the dynamic VECM system. It provides the proportion of the movements in the exogenous variables that are due to their own shock, versus shocks to the other variables. Therefore, in this study, the Cholesky order is used.

Appendix B Table B.2 and B.4 present the forecast error variance decomposition for the inward FII flows to Jordan and Australia over a 24-month period disequilibrium. The variance decomposition of inward FII in Jordan clearly indicates that most (78.39%) of the variation of inward FII is explained by its own innovations even after the 10th period. The results of variance decomposition indicate that the financial health, political stability, stock market price, inflation and interest rate are strongly exogenous in explaining the behaviour of inward FII flows to Jordan economy over the 24-month period.

The shock forecast error variance of Jordan financial health explains 6.27% of the variance of inward FII flows to Jordan. The results of forecast error variance decomposition suggest that almost 18.87% and 7.74% of the changes in inward FII come from Jordanian and Australian political stability respectively. The shock forecast error variance of stock market price explains 9.13% of the variance of inward FII flows to Jordan and Australia's stock market price explain almost 10.93% of the behaviour of inward FII in Australia. The results of forecast error variance decomposition suggest that almost 6.73 of the changes in inward FII in Australia come from the trade openness.

The inflation explains almost 6.65% and 10.55% of the changes in the movements of inward FII in Jordan and Australia respectively. The shock of forecast error variance

of interest rate accounts explain 13.43% and 8.88% of the movements in inward FII flows to Jordan economy and 8.88% of the movements in inward FII flows to Australia economy. This implies that the variance decomposition results support the findings of the Granger causality test and VECM in terms of ECT.

In summary, Granger causality, impulse responses function and variance decomposition are conducted based on VECM to examine short-term between the specified variables. The Granger causality test based on VECM indicates that there is Granger causality running from the Jordan's exogenous variables including economic health, trade openness, stock market price and inflation to the endogenous variable. In contrast, Australia's financial health, political stability, trade openness, stock market price and inflation Granger cause inward FII. The results of IRF confirm the outcomes of the Johansen cointegration test and Granger causality test VECM in terms of ECT, stating that exogenous variables play a major role in determining inward FII in Jordan and Australia. In general, the findings indicate that the shock of one standard deviation innovation has a major and persistent impact on inward FII flows to Jordan and Australia, suggesting that the changing of inward FII behaviour and decision in Jordan and Australia is influenced by long period of time. Further, the results of variance decomposition support the Granger causality results.

## **6.8 Summary of the Findings and Conclusion**

In determining inward FDI and FII in Jordan and Australia, the study examines the long-term and short-term relationship between inward FDI, FII flows into Jordan and Australia, country risks (financial health, economic health and political risk rate) trade openness, stock market price, and macroeconomic factors (inflation and interest rate). The results of determining inward FDI and FII in Jordan and Australia show that the ADF and PP results confirm that the specified variables and errors are time-dependent. First differencing removes time dependency in the data where the first differenced interest variables and errors of these relationships are stationary and integrated in the first order ( $I(1)$ ). The 11 and 10 lags length of VAR for determining inward FDI and FII flows into Jordan's and Australia's economies are selected by AIC information criterion, since they are not serially correlated.

In terms of the long-term relationship, the Johansen and Juselius approach and VECM are applied to capture the long-term equilibrium relationships between the Jordan's and Australia's specified variables. Further, the significance of zero restrictions was employed to capture the significant entrance the cointegration equations test. The Johansen and Juselius approach (Trace and  $\lambda_{\max}$  tests) indicate that there are eight and five cointegrating equations respectively at 1% level of significance for inward FDI in Jordan and four and three cointegrating equations respectively at 1% and 5% level of significance for inward FDI in Australia. This implies that there is the possibility of significant causality between the specified and significant variables in the system. The ECTs confirm the existence of a long-term equilibrium relationship between the specified variables.

In terms of the short-term relationships, Granger causality, exogeneity test; also, IRFs and variance decomposition are conducted based on VECM to determine the weak and strong exogenous variables in the system. The Granger causality test based on VECM indicates that there is Granger causality running from the exogenous variables including financial health, political stability, trade openness and interest rate to the inward FDI flows to Jordan's economy. In contrast, there is Granger causality running from the exogenous variables including economic health, trade openness, stock market price, interest rate to inward FDI flows into the Australian economy. The results of IRFs support the outcomes of the Johansen cointegration test and Granger causality test VECM in terms of ECT, stating that exogenous variables play a major role in determining inward FDI in Jordan and Australia. In general, the findings indicated that the shock of one standard deviation innovation had a major and persistent impact on inward FDI flows into Jordan and Australia, suggesting that the changing of inward FDI behaviour and decision making in Jordan is influenced by long periods of time.

The results of variance decomposition indicate that there are some similarities and differences in the driving forces of inward FDI in Jordan and Australia. For example, economic health, trade openness and inflation are relatively stronger exogenous variables in determining the behaviour of inward FDI in Jordan and Australia. However, stock market price and interest rate are the two significant exogenous variables influencing the behaviour of inward FDI in Australia. In relation to inward

FDI in Jordan, financial health is significantly exogenous in determining the behaviour of inward FDI in Jordan

In regard to the determinants of inward FII in Jordan and Australia, the Johansen and Juselius approach (Trace and  $\lambda_{\max}$  tests) indicate that there are eight and two cointegrating equations respectively at 1% level of significance for inward FII in Jordan and four and four cointegrating equations respectively at 1% and 5% level of significance for inward FII in Australia. This implies that there is the possibility of causality between the specified variables in the system. The ECTs confirm the existence of a long-term equilibrium relationship between the variables and the speed of the system towards stability.

In terms of the short-term relationships, Granger causality, exogeneity test, impulse responses function and variance decomposition are conducted based on the VECM. The Granger causality test indicates that there is causality running from the exogenous variables including economic health, trade openness, stock market price and inflation to the inward FII flows to Jordan's economy. In contrast, there is Granger causality running from the exogenous variables including economic health, political stability, trade openness, stock market price and inflation to the inward FII flows to the Australian economy. The results of IRF support the outcomes of the Johansen cointegration test, Granger causality test, the VECM in terms of the ECTs, thus stating that those exogenous variables play a major role in determining inward FII in Jordan and Australia. In general, the findings indicated that the shock of a one standard deviation innovation has a major and persistent impact on inward FII flows into Jordan and Australia, suggesting that the changing of inward FII behaviour and decision making in Jordan is influenced by long periods of time in terms of the optimal lag.

The results of variance decomposition, suggest that financial risk rate, political risk rate, stock market price, inflation and interest rate are relatively stronger exogenous variables in determining the behaviour of inward FII in Jordan. In contrast, political risk rate, trade openness, stock market, inflation and interest rate are relatively stronger exogenous variables (in that order) in determining the behaviour of inward FII in Australia.

## CHAPTER SEVEN

### DISCUSSION

#### 7.1 Overview Chapter

The main findings for the lagged model are discussed in relation to the hypotheses, theory and previous research in order to determine whether or not these are supported. The Chapter discusses the long-term and short-term relationships between specified variables in the system by using the Johansen approach, the vector error correction model (VECM), Granger causality, impulse responses functions and variance decomposition. This Chapter also discusses the findings in the context of this research and its contribution to the body of knowledge. This Chapter mainly discusses the determinants of inward FDI and FII in Jordan and Australia in section 7.3 and the contribution to knowledge in Section 7.4.

#### 7.2 Unit Root Tests

This section discusses the main findings of the study. The vector autoregressive (VAR) model is a general framework used to describe the dynamic interrelationship among non-stationary variables (Asteriou, 2006). According to Braun and Mittnik (1993) and Lütkepohl (1993), determining the lag order of the autoregressive lag polynomial is an important aspect of empirical research on the specification of VAR models, since all inferences in the VAR model depend on the correct model specification. It is necessary to test the variables for stationarity and determine the order of integration of time series before proceeding with the cointegration and Granger causality tests, impulse response and variance decomposition tests, all of which are based on the VECM. The unit root test, including augmented Dickey Fuller (ADF) and Phillips and Perron (PP) tests were utilised to examine the presence of unit roots in both price levels and the first difference of the variables.

As previously mentioned the ADF (Dickey & Fuller, 1979) and the PP (Phillips & Perron, 1988) tests are central to the study and it is recalled that they are carried out to test for the presence of unit roots in both levels and first differences of the time series data and to establish the order of integration of the series. The ADF test provides robust results when serial correlation is present. According to Perron (1989) and Perron and Vogelsang (1992) the PP test for unit roots provides better

results in the case of possible structural breaks in the time series. Therefore, both tests are implemented to determine the stationary variables and the order of integration. The null hypothesis of the ADF and PP tests is that a unit root exists among the variables in levels, as against the alternative of stationarity.

The results indicate that the null hypothesis of both tests cannot be rejected when all variables are in levels series. In other words, the variables in levels are non-stationary, as the value of the (t) statistic is greater than the critical values of the ADF and PP tests. The data are transformed from levels to first difference and tested again for stationary and non-stationary time series data. The results indicate acceptance of the alternative hypothesis at 1% level, as the (t) statistic is smaller than the critical values of the ADF and PP tests. Therefore, the variables are integrated I (1) (of order one) and it is appropriate to proceed to test for cointegration. The errors of the first difference relationships are also found to be stationary. The results confirm that the processes are integrated and non-stationary and testing could now be undertaken for cointegration.

The results of ADF and PP confirm that FDI, FII, country risks, trade openness, macroeconomic factors and errors are time dependent in level series. First differencing removes time dependency in the data, thus leaving the path free to specify a VAR model in level series and test for long-term relationships in cointegration using the Johansen and Juselius (1990) approach, and exogeneity and short-term relationships employing the VECM, Granger's (1988) causality test. The results are confirmed by impulse responses functions and variance decomposition analysis.

### **7.3 Determinants of Inward Foreign Investment in Jordan and Australia**

As presented in Chapter Three, review of past studies and theories of determining inward foreign investment (FDI & FII) suggests a number of distinct views. The financial, economic and political determinants significantly influence inward FDI and FII and indicate mixed results for the difference between developed and developing host economies. For example, several studies concentrate on the individual impact of a country's determinants on inward FDI and FII (For example,

Brada et al., 2006; Kenisarin & Andrews-Speed, 2008; Khrawish & Siam, 2010 and Cuyvers et al., 2011).

On the other hand, the Jordanian studies focus on market-seeking advantage, but the testing of variables are directed towards framework policy factors, such as corruption, quality of institutions, quality of governance infrastructure, exports and trade openness (For example, Méon & Sekkat, 2004; Habash, 2007; Bakir & Alfawwaz, 2009; Khrawish & Siam, 2010 and Sekkat, 2012). Previous Australian studies concentrating on ownership advantages provide predicated results, but the testing of variables in these studies concentrate on location factors, such as market size, factor costs, transport costs and protection and risk factors (For example, Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer et al., 2009).

A number of researchers (For example, Wijeweera & Mounter, 2007; Constant and Yue, 2010; Siddiqui & Ahmad, 2011 and Pradhan & Saha, 2011) have studied the dynamic determinants of inward FDI and FII. A few of them consider the dynamic relationship between all country risk determinants, stock market price and inward FII. Despite the fact that past studies have examined the dynamic movements between foreign investment and part of country risk determinants, trade openness and macroeconomic environment, there is no evidence of a long-term relationship, short-term relationship, or exogeneity between the variables. Past studies also used the VAR model and the Granger causality test to determine long-term relationships and the direction of exogeneity.

Hence, this study undertook further analysis to explore the behaviour of inward FDI in the long-term equilibrium and short-term dynamic relationships between country risks (financial health, economic health and political stability), trade openness, stock market price, macroeconomic environment (inflation and interest rate). The Johansen and Juselius (1990) approach and VECM are applied in order to determine the long-term relationships between the specified variables in the system. Also, the Granger causality test, impulse responses functions and variance decompositions are applied in order to determine the short-term relationships between the specified variables in the system.

### **7.3.1 Determinants of Inward FDI Behaviour in Jordan and Australia**

Since the specified variables in the system are I (1), this implies that they may have a long-term equilibrium relationship and although they may deviate from this in the short-term, the system will return to stability in the long-term.

Several steps are considered to detect the long-term equilibrium relationships among the variables as follows: based on the VAR model lag order selection criteria tests employed, the Johansen and Juselius (1990) approach is applied to test for cointegration. Finally, to confirm the existence of the long-term equilibrium, the Johansen cointegration test is re-applied (using the optimal lag discovered in the VAR) by specifying a VECM.

According to Stock and Watson (1989), the Johansen approach is sensitive to the lag length used in the VECM and to the sample-ending point. The lag length order selection criteria of the VAR model is used to determine the required length of the lag for the Johansen cointegration test. The lag selection in VAR model criterion is the Akaike's (1973) information criterion (AIC), Schwarz (1978) information criterion (SIC), Hannan-Quinn (1978) criterion and (HQ). A VAR stability condition check is also applied and the VAR found to be stable.

The VAR lag order selection criteria tests are used to identify the numbers of lag. In the case of Jordan, the maximum possible lag length considered is 11 months. In this study, the choice was ambiguous because it became apparent that only one lag was needed by the SC and HQ, 11 lags with the AIC. Further examination found serial correlation at one lag. Therefore, the 11 lags length of VAR was selected by the AIC information criterion, since they were not serially correlated.

Similarly in the case of Australia, the maximum possible lag length considered is 10 months. Therefore, the choice was ambiguous, because only one lag was needed by the SC and HQ, 10 lags with the AIC. Further examination found serial correlation at one lag. Therefore, the 10 lags length of VAR was selected by the AIC information criterion, since they are not serially correlated.

Therefore, this study contributes to related past studies and theories as it testes for dynamic long-term balanced relationships by using the Johansen and Juselius

approach and VECM and short-term relationships, with the Granger causality test, impulse response functions and variance decompositions. The hypotheses relating to long-term equilibrium between the specified variables in the system and the bases for the formulation of those hypotheses are as follows:

**H<sub>8a</sub>: Cointegration Relationships Do Not Exist In the FDI Model for Jordan and Australia**

According to the results of the Johansen cointegration test statistics (Trace test and Maximum Eigen Value test), the hypothesis of existing cointegrating vectors is accepted (refer Table 6.4). In other words, there are long-term equilibrium relationships between inward FDI for Jordan and Australia and their country risks, trade openness, stock market price, macroeconomic environment. More precisely, Trace and Maximum Eigen Value tests indicate that there are eight and five cointegrating equations respectively at 1% level of significance in the inward FDI model for Jordan. Also, these tests indicate that there are four and three cointegrating equations respectively at 1% level of significance in the inward FDI for Australia.

The results of error correction terms (ECTs) of the VECM confirm the Johansen cointegration test findings (refer Table 6.5). The adjustment coefficient on ECT of inward FDI inflows in Jordan is negatively significant at 1% level. This result indicates that, when deviating from the long-term equilibrium, the ECT has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of a long-term relationship between FDI flow, country risks, trade openness, stock market price and macroeconomic factors.

The VECM also shows the speed of the system when the variables interacting in a single system and adjusted R-squared. Jordan economic health (ER) is ranked first, followed by trade openness (OP) and stock market price (IS). However, the specified and focused model of this study (inward FDI in Jordan) is ranked fourth in explanatory power. Therefore, to identify the exogenous variable Grange causality test is applied and impulse response functions and variance decomposition are undertaken to confirm exogeneity

The results of the ECT for Jordan's country risks (financial health, economic health and political stability) when treated endogenously show a negative sign but financial

and economic health are not significant. However, the Jordan political stability is significantly related to the behaviour of inward FDI only in the long-term at 10% level of significance.

According to ICRG, high political risk in a host country indicates stable political conditions. The political stability of a foreign country includes government stability, government quality, rules of law and adequate, protection of property rights, voice and accountability government, transparency and legislations. According to ICRG, high political risk rates reflect lower political risk rate and a stable political environment. This is associated with high level of inward FDI flows to foreign country. Although Jordan has fairly strong political stability (for example protection of property rights, voice and accountability government, low corruption, transparency and legislations), it is surrounded by unstable regimes. This means that Jordan has to work hard to attract foreign investment. Thus, high political stability (risk ratings) is associated with high flows of inward FDI in Jordan's economy.

The acceptance of the Jordan's alternative hypothesis in terms of the predicated cointegration relationships is supported by several previous studies, such as Guy (2000), Roll and Talbott (2001), Ursprung (2002), Jensen (2003), Globerman and Shapiro (2002), Rui (2003), Shapiro (2003), Busse (2004), Acemoglu et al. (2005) and Li and Filer (2007).

The FDI is responsive to a particular country's political conditions. This means that the country that has institutional efficiencies and prudential laws and regulations with the purpose of protecting the property rights and civil rights of an investor can be more effective at attracting FDI (Guy, 2000 and Roll & Talbott, 2001). Multinational enterprises and foreign investors have explored many theoretical and empirical studies dealing with factors that influence decisions and location choices for investment abroad. Some are firm-level characteristics while others are country-level characteristics, which in turn can be either host country characteristics or home country characteristics. For example, Harms and Ursprung (2002); Jansen, (2004); Globerman and Shapiro (2003); Rui (2003), Shapiro (2003); Busse (2004); Acemoglu et al. (2005) Li and Filer (2007) point out that MNFs are more likely to be attracted to a democracy. In other words, foreign investors consider level of

democracy in a host country to investment, which provides promise of market friendly policies and political institutions that create a better business environment.

According to Dunning's Eclectic Paradigm, the OLI framework considers foreign investment to be determined by the ownership, location and internalisation advantages. In other words, a firm will directly invest in a foreign country if it meets these three conditions (For example, Dunning & Dilyard, 1999; Jones & Wren, 2006 and Dunning & Lunden, 2008).

Globerman and Shapiro (2002) find that foreign investors prefer to invest in countries with a rule of law and strong protection of property rights. According to these researchers, legislation, regulation and the legal system is a key determinant of both location and amount of US FDI flow to 144 countries from 1995 to 1997.

Similarly, Nunnenkamp and Spatz (2004) explore the intellectual property rights IPR-FDI linkage using sectorally disaggregated FDI stocks data for a large sample of 166 host countries. They report that the significantly positive coefficient of interaction term reveals that IPR has become more important for foreign investors. Kolstad and Villanger (2008) analyse the data of industry level FDI from 57 countries from 1989 to 2000. They investigate the foreign economy determinants of FDI flows in services as a whole and in the major service industries. Kolstad and Villanger find that institutional quality and democracy appear more important for FDI in services than general investment risk or political stability and also that democracy is essential for FDI in developing economies and institutional quality matters in industrialised economies.

Seyoum (2009) describes transparency as the concept of removing all barriers to facilitate free and easy public access to corporate information. Further, it relates to the laws, rules, social connivance and processes that facilitate and protect those individuals and corporations freely joining, develop, and improving the process. He suggests that higher levels of corporate transparency lead to a higher level of inward FDI.

The results of ECTs value for the stock market price and interest rate lagged endogenous variables have a positive and insignificant sign, confirming the absence of a long-term equilibrium relationship for stock market price and interest rate. This

implies that the stock market price and interest are not cointegrated with inward FDI. Nevertheless, trade openness and inflation have a negative sign at 5% and 10% levels of significance respectively. This confirms the existence of a long-term equilibrium relationship and supports the long-term relationships hypothesis.

Jordan's foreign trade policy is based on the standards of economic openness and integration into the rapidly globalising world economy. Jordan has made giant strides on the path of economic and trade liberalisation in addition to reinforcing mechanisms and functioning of a market-oriented economy that is built on the active role played by the private sector in managing economic activities. This has been made possible by a concentrated reform process creating a modern and encouraging regulatory environment for business and investment.

Jordan manages to nurture its economic ties with its neighbouring Arab countries by joining the Greater Arab Free Trade Area (GAFTA) and signing a number of bilateral trade agreements, such as the European Union, free trade agreement with the United States of America, World Trade Organization (WTO), free trade agreements with the European Free Trade Association (EFTA) countries and Singapore.

Jordan's inflation rate has remained low due mainly to stable monetary policy and the continued peg to the United States dollar. The acceptance of the long-term relationships hypothesis is supported by several studies, for example, Rammal and Zurbruegg, (2006); Hasen and Giorgioni, (2007) and Trevino et al. (2008). Rammal and Zurbruegg (2006) select annual inflation rates (measured as a function of the local consumer price index) as one of the control variables that are regularly used in the FDI literature. The researchers argue that a higher inflation rate in a host country is a disincentive to invest in that country.

Rammal and Zurbruegg (2006) show a negative relationship between annual inflation rates and FDI. This means that an increase in the inflation rate lessens FDI in the host country. This is supported by the findings of Hasen and Giorgioni (2007). They study the determinants of FDI inflows to Arab Maghreb Union (AMU) countries. They use a set of data from 1990 to 2006 and apply simultaneous equation regression. These researchers state that the annual inflation rate has a negative effect

and significance, which explains why Maghreb countries attract FDI less than do other countries at a similar stage of development.

The results of zero restrictions on coefficients of cointegrated equations of VECM also support the findings of ECT of VECM and Johansen's cointegration test findings for the inward FDI model in Jordan, that is, as most of the LR tests reject the null hypothesis that the *ith* endogenous variable does not enter the cointegrating equations significantly. This implies that inward FDI, economic health, political stability, trade openness, stock market price and inflation are the eight significant cointegrating relationships. The null hypothesis political risk and interest rate, therefore, cannot be rejected. This indicates that political risk and interest rate do not enter the cointegration relationships.

The results of ECTs of VECM confirm Johansen's cointegration test findings (refer Table 6.5). The adjustment coefficient on ECT of inward FDI inflows into Australia is negative and statistically significant at 10% level of significance. This indicates that when the ECT deviating from the long-term equilibrium, error correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of long-term relationships between FDI flow, country risks, trade openness, stock market price and macroeconomic factors.

The VECM also shows the speed of the system when the variables interacting in a single system and adjusted R-squared. Australia's trade openness (OP) is ranked first. The specified and focused model of this study (inward FDI in Australia) is ranked second in explain the behaviour of other variables follow by economic health (ER) and financial health (FR). Therefore, to identify the exogenous variable Grange causality test is applied and impulse response functions and variance decomposition are undertaken to confirm exogeneity.

The results of the ECT for Australia's country risks (financial health, economic health and political stability) lagged endogenous variables have a negative sign of the ECT, indicating the existence of a long-term equilibrium relationship between Australian country risks and inward FDI. More precisely, the speed adjustment towards equilibrium for financial health and political stability is insignificant.

However, the Australian economic health significantly is cointegrated with the behaviour of inward FDI at 10% level.

According to ICRG, high economic health in a host country indicates a stable and healthy economy. The economic health of a foreign country includes high real gross domestic product (GDP), high growth, low annual inflation rate and high gross national product per head. The Australian economy has a high GDP per head and low inflation rate, which make it an attractive destination for foreign investors. Australia's status as a highly competitive economy continues to strengthen. In 2009, the Australian economy's overall competitiveness was ranked in the top three countries in the Asia-Pacific region (Garelli, 2009).

For many years, Australia exceeded Organisation for Economic Co-operation and Development (OECD) economies in both growth and elasticity of the economy. The Australian economy has been found to be the most elastic in the world and its average growth rate from 1998-2009 was 3.4% (Garelli, 2009). In addition, an efficient and independent financial sector and proven regulatory financial system, makes the Australian economy deliver a sound platform for FDI and advanced business environment (Australian Bureau of Statistics, 2008).

The result is largely consistent with the findings of Rammal and Zurbruegg, (2006), Hasen and G Giorgioni (2007), Blonigen et al. (2007), Trevino et al. (2008) Azam and Lukman (2010) and Tekin (2012). Trevino et al. (2008) argue that the level of inflation in 16 Latin American nations is negatively associated with their level of inward FDI. They employ a fixed-effects model and several indices of institutional change that covers a 31-year period between 1970 and 2000. Trevino et al. (2008) find an insignificant indication that a lower level of inflation rate in host Latin American economies leads to a greater level of FDI.

According to Dunning and Lundan (2008) and Bitzenis et al. (2009) economic variables, such as GDP are considered to be the most important in determining FDI. Azam and Lukman (2010) study the impact of different economic determinants on FDI for Armenia, Kyrgyz Republic and Turkmenistan. The researcher use secondary data from 1991 to 2009 and use a simple econometric model (log least squares

technique). The researchers also show a positive relationship between FDI and GDP in the host economy.

Asiedu and Lien (2011) assume that a lower level of inflation rate in developing countries has a positive influence on FDI. Their empirical results indicate that lower inflation attracts more foreign investors and encourages FDI. Tekin (2012) explores potential Granger causality between the real GDP, real exports and inward FDI in least-developed countries between 1970 and 2009. Tekin finds that there is Granger causality running from FDI to real exports in Benin, but real exports Granger cause inward FDI in Haiti. Indeed, trade openness and economic liberalisation are two of the factors that increase the attractiveness of foreign direct and indirect investment to foreign economy.

Gohou and Soumare (2012) analyse the connection between FDI and GDP per capita. The researchers use a sample of five African free-trade areas for the 1990-2007 period. Gohou and Soumare (2012) use panel data regression to conclude that real GDP per capital and FDI have a positive bi-directional relationship. Indeed, the inward FDI had a positive relationship with a host economy's GDP. Thapa and Poshakwale (2012) used data from 36 countries, both developed and developing, from 2001 to 2009 with approximately 4600 observations. They find that a positive and statistically significant connection existed between the foreign equity portfolio allocation and GDP growth.

The results of ECTs value for the trade openness, stock market and interest rate lagged endogenous variables provide a significant and negative sign at 1%, 10% and 10% levels respectively, confirming the existence of long-term equilibrium relationships for trade openness, stock market price and interest rate.

Australia is considered a serious trade and investment player, making more than 20% of GDP from exports and more than 36% from FDI stock and its economy is now predominantly services-based, with services accounting for just over 60% of economic activity (Australian Bureau of Statistics, 2008). Australia's exposure to engagement with the Asian region offers a strategic advantage to companies looking to position themselves for global growth opportunities. The Australian market is open for trade and foreign investment and has the capacity to deploy both itself

capital and other people's capital carefully and profitably. The Government has not had to give direct financial support to the banking system and Australia is free of the difficult governance and exit strategy issues that such support produces in a number of other countries.

The results of ECT are consistent with Constant and Yue (2010), who examines the long-term relationship between FDI and trade openness in the Côte d'Ivoire from 1980 to 2007. The researcher uses a cointegration approach and the VAR Granger causality Block Exogeneity Wald tests. Constant and Yue (2010) concludes that a long-term relationship between the FDI and trade openness and Granger causality Block Exogeneity Wald test shows a uni-directional causal relationship running from FDI to trade openness.

More recently, several studies have analysed the impact of trade openness on foreign investment inflows to a host country. Babatunde (2011) investigates whether trade openness in the SSA region enhanced the record in terms of FDI attractiveness. The author uses a fixed and random effect model in order to examine the information or data from an unbalanced group of 42 SSA countries between 1980 and 2003. Babatunde (2011) points out that trade openness (exports and imports) encouraged the inflows of FDI in the sample and there is a positive and statistically significant relationship between trade openness and FDI.

The results of ECT value for the stock market lagged endogenous variable has a significant and negative at 10% level, confirming the existence of long-term equilibrium relationships for stock market price. The geographical location of Sydney gives Australia Stock Exchange (ASX) a unique feature, since it is the first major market to open in the world each day. In other words, Sydney's time zone provides companies with a unique opportunity to take advantage of the full trading day in Asia while also linking the closing of the US markets and the opening of the European markets. This allows global financial services firms to provide after-hours coverage for their US and European markets from Australia in a 'follow-the-sun' system.

The ASX is established in August 2010. The ASX is the twelfth largest in the world. In February 2011, the market capitalisation of Australia domestic companies is

valued at \$1.46 trillion. In terms of float market capitalisation, the ASX is the sixth largest and in terms of listed domestic companies in the Asia Pacific.

The result of the ARCH model is consistent with the findings of Naceur et al. (2007) and Kholdy and Sohrabian (2007). Naceur et al. (2007) note that among other studies, the existence of an equity market is important because: it provides investors with an exit mechanism and attracts foreign capital (FDI) inflows. Further, an equity market provides important information that improves the efficiency of the financial system; and it provides the valuation of companies to foreign investors.

Zakaria (2007) examines the causal relationship between inward FDI and financial development in 37 developing countries in a multivariate framework. The research uses two categories of financial development credit markets and equity markets to carry out the causality tests based on a multivariate model. Zakaria (2007) concludes that there is bi-directional causality between inward FDI and the development of the domestic stock market in the developing countries. The significant reverse causality from the stock market development to inward FDI indicated that the existence of a better developed stock market is imperative for attracting capital flows (FDI).

The results of ECT value for the Australian interest rate lagged endogenous variable has a negative sign and it is significant at 10% level, confirming that the existence of long-term equilibrium relationships for interest rate. On the other hand, the results of the ECT for Australian inflation lagged endogenous variable has a positive ECT sign, suggesting that there is no long-term equilibrium relationship for inflation.

Australia is a price-taker in global capital markets; thus, Australian interest rates move with the global financial market trends. Generally, Australian interest rates are higher compared to the international standards largely due to strong fiscal policies relative to other developed countries (Kirchner, 2012). In Australia, the Reserve Bank (RBA) determines the interest rate. It does so by changing the amount of money supplied; in other words, it alters the equilibrium between the quantity of money supplied and money demanded.

Many studies, such as Farrell et al. (2000), Pan (2003) and Uctum and Uctum (2011) suggest and support that decisions regarding inward FDI are related to the interest rate. Farrell et al. (2000) review the annual data of manufacturing industries and 16

countries for the period 1984-1995, in order to identify the determinants of Japanese FDI. They report that the interest rate is negative and significantly determines Japanese FDI.

Pan (2003) explores the influences of host country factors, such as interest rates on inward FDI in China between 1984 and 1996 and maintained that firms in countries with low interest rates enjoy a cost advantage that enables them to raise more capital with a lower burden of interest payment. This means that the cost of borrowing in the source country has a negative association with its inward FDI in China. Uctum and Uctum (2011) analysed the relationship between the interest rate and inward FDI in Turkey. They revealed a negative relationship between FDI in Turkey and the interest rate.

The results of zero restrictions on coefficients of cointegrated equations of the VECM also support the findings of the ECTs of VECM and Johansen's cointegration findings for the inward FDI model in Australia. Most of the LR tests reject the null hypothesis that the *ith* endogenous variable does not enter the cointegrating equations significantly in relation to Australia. This implies that the inward FDI, economic health, political stability, trade openness, stock market price and inflation enter the cointegrating relationships significantly. The null hypothesis of financial health, political stability, stock market price and inflation cannot be rejected. This indicates that they do not enter the cointegrating equations significantly.

Having confirmed the existence of cointegration relationships between the specified variables in the system and the rank of the main model Granger causality is applied to identify the exogenous variables. Further, impulse response functions and variance decomposition are undertaken to confirm exogeneity based on VECM. The study examines the following Granger causality test questions Do Jordan's and Australia's country risks (financial health, economic health and political stability) Granger cause inward FDI flows to Jordan's and Australia's economies? Does Jordan's and Australia's trade openness Granger cause inward FDI flows to Jordan's and Australia's economies? Does Jordan's stock market price Granger cause inward FDI flows to Jordan? Do Jordan's and Australia's macroeconomic factors (inflation and interest rate) Granger cause inward FDI flows to Jordan's and Australia's

economies? The study used the Block Erogeneity Wald test with a chi-square statistics to capture the existence of Granger causal relationships when all the specified variables interact in the system. Thus, the hypothesis relating to the short-term causal relationships is as follows:

**H<sub>9a</sub>: Causal Relationships Do not Exist in the FDI Model for Jordan and Australia**

The Granger causality test accepts the hypothesis of Jordan's financial health and political stability, as the financial and political risk rate Granger cause the inflows of inward FDI in the short-term into the Jordan economy at 1% level of significance. According to ICRG, the high financial risk rate reflects high financial health. Financial health covers the stability of exchange rate, interest rate, external debt and current account. The acceptance of the alternative hypothesis in terms of Causal relationships is supported by previous studies related to the financial health of foreign country. Many studies including those of Cushman (1985), Goldberg (1993), Farrell et al. (2000), Pan (2003), Mencinger (2003), Kun-Ming et al. (2006) Salman and Fang (2009) and Gwenhamo (2011) indicate that the decision of inward FDI is related to financial health.

Kun-Ming et al. (2006) examine the effect of exchange rate, sunk costs and host country wage rate on the movement of FDI by employing a real option model. Kun-Ming et al. (2006) find that while depreciation of a host country's currency tends to stimulate FDI activity of cost-oriented firms, the depreciation tends to deter FDI activity for market-oriented firms and vice versa. In the case of the forest products industry, a strong U.S. dollar increased the outward FDI from the U.S.

Salman and Fang (2009) investigate the behavioural relationship between FDI in Pakistan and current account during the period 1971-2005. Salman and Fang (2009, 278) highlight a long-running relationship between FDI in Pakistan and the current account deficit. Also, they indicated that an 11% increase in FDI causes a double increase in the current account deficit. Therefore, there is a negative relationship between FDI and the current account.

Gwenhamo (2011) examines the relationship between external debt and inward FDI in Zimbabwe for the period 1964-2005. Gwenhamo (2011) suggests that the ratio of

external debt to GDP in Zimbabwe has significant and negative long-term coefficient effects on inward FDI. This indicates that an increase in the government's external debt burden increases the likelihood of balance of payments problems. In other words, this supports the notion that increasing the government's external debt burden results in uncertainty in terms of future policy regarding foreign capital, which will discourage FDI. Indeed, a large government external debt burden may be an indication of weak or poor microeconomic policies.

Conversely, the Granger causality hypothesis of Jordanian economic health is rejected, indicating that the economic health does not Granger-cause inward FDI flows to Jordan. The Granger causality results of Jordan's country risks suggest that reverse causality is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional between financial health and political stability and inward FDI.

In the short-term Granger causality relationships, there is Granger causality running from the trade openness to the flows of inward FDI into the Jordan economy at a 5% level of significance. In terms of reverse causality, there is strong reverse Granger causality running from the flows of inward FDI to Jordan's trade openness at 1% level of significance. This reveals that there is bi-directional Granger causality between inward FDI and trade openness. In other words, inward FDI is strong exogenous, however, in this research the main focus on the specified inward FDI model as endogenous variable. Nevertheless, the null hypothesis of stock market price Grange causality cannot be rejected. This implies that there is no Granger causality running from the stock market price to inward FDI.

There is no Granger causality running from the inflation rate to flows of inward FDI in Jordan. In terms of the reverse causality, there is no reverse Grangers causality running from the inward FDI to inflation rate. There is significant Granger causality direction from the interest rate to inward FDI at 5% level. The reverse causality of interest rate cannot be accepted. This suggests that there is uni-directional Granger causality.

Thus, the Granger causality test based on VECM concludes that there is Granger causality running jointly from the exogenous variables including country, trade

openness, stock market price and macroeconomic factors to the endogenous variable. This confirms the indication of existing Granger causality among the specified variables system according to the ECT results.

The results of variance decomposition are consistent with the Granger causality test, based on VECM (refer Appendix A, Table A.2: The Results of Variance Decomposition Analysis of Inward FDI in Jordan). The results of variance decomposition indicate that financial health, economic health, trade openness and inflation are relatively strong exogenous in explaining the behaviour of inward FDI flows to the Jordanian economy over 24 months.

The shock forecast error variance of Jordan's financial health account for 10.22% of the variance of inward FDI flows to Jordan. The results of forecast error variance decomposition suggest that almost 5.56% of the changes in inward FDI come from the economic health. According to ICRG, a high economic health in a host country indicates a stable and healthy economy.

The economic health of a foreign country includes real gross domestic product (GDP), growth, annual inflation rate, and gross national product per head. Jordan's economy has a reasonable GDP per head and low inflation rate. In contrast, the Australian economy has a high GDP per head and low inflation rate, which make it an attractive destination for foreign investors. The results of the variance decomposition are largely consistent with the findings of Rammal and Zurbruegg (2006), Hasen and Giorgioni (2007), Blonigen et al. (2007), Trevino et al. (2008) and Azam (2010).

Trevino et al. (2008) argue that level of inflation in 16 Latin American nations is negatively associated with their level of inward FDI. They utilise a fixed-effects model and several indices of institutional change that covered a 31-year period between 1970 and 2000. They do not find any indication that a lower level of inflation rate in host Latin American economies leads to a greater level of FDI.

According to Dunning and Lundan (2008), Bitzenis et al. (2009) economic variables, such as GDP are considered to be the most important in determining FDI. Azam (2010) investigates the impact of different economic determinants on FDI for Armenia, Kyrgyz Republic and Turkmenistan. The researcher uses secondary data

from 1991 to 2009 and a simple econometric model (log least squares technique). Azam (2010) shows a positive relationship between FDI and GDP in the host economy. Asiedu and Lien (2011) assume that a lower level of inflation rate in developing countries has a positive influence on FDI. Their empirical results indicate that lower inflation attracts more foreign investors and encourages FDI.

Trade openness explains almost 5.42% of the changes in movements of inward FDI flows to Jordan. The shock of forecast error variance of inflation explains 10.19% of the movements in inward FDI flows to Jordan economy. This implies that the variance decomposition results support the findings of the Granger causality test and VECM, in terms of ECT. Further, the findings suggest that financial health, economic health, trade openness and inflation are relatively strong exogenous in determining the behaviour of inward FDI.

The findings of impulse response functions support the Granger causality test findings, based on VECM (refer Appendix A, Figure A.1: Inward FDI in Jordan Response to Cholesky One S.D Innovations  $\pm$  2 S.E). The shock of Jordan's country risk (financial health, economic health and political stability) on inward FDI persists positively over the 24 month period. This implies that country risks have a uni-directional effect on the flows of inward FDI in Jordan economy. The shock of one standard deviation of trade openness on inward FDI flows to Jordan is negative for the first three periods; then the response of inward FDI persists positively after the third month. This indicates that the negative relationships for the first three months will not prevent foreign investors from investing in Jordanian economy, as the FDI is considered long-term investment. Therefore, the foreign investors will continue investing in Jordanian economy. The response of inward FDI to the shock of stock market persists positively. The shock of one standard deviation of macroeconomic environment (inflation and interest rate) on inward FDI is negative over the 24 months. Further, the results of ARCH model support the findings of IRFs in terms of the relationship sign between inward FDI and the specified variables.

The alternative hypothesis of the Granger causality test of Australian financial and political stability is rejected, implying that the financial health and political stability do not Granger-cause the inflows of inward FDI in the Australian economy. However, the alternative hypothesis of the Granger causality test of Australian

economic risk rate is accepted, as the economic health Granger cause the inflows of inward FDI to Australian economy at a 1% level of significance. The Granger causality results from Australian country risks suggest that the reverse causality is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional causality between economic health and inward FDI.

In the short-term Granger causality relationships, the alternative hypothesis of Australian trade openness is accepted, suggesting that there is Granger causality running from the trade openness to the flows of inward FDI to Australian economy at a 10% level of significance. In terms of the reverse causality, there is no reverse Granger causality running from the flows of inward FDI to Australian trade openness. This indicates that there is uni-directional Granger causality between inward FDI and trade openness. Also, there is Granger causality running from the stock market price to inward FDI. In terms of the reverse causality, there is no reverse Granger causality running from inward FDI to Australian stock market price. This reveals that there is uni-directional Granger causality between inward FDI and stock market price.

The results suggest that there is no Granger causality running from inflation rate to the flows of inward FDI and no reverse Granger causality running from the inward FDI to inflation rate. The alternative hypothesis of interest Grange causality relationships is accepted at 5% level of significance. The reverse causality of interest rate cannot be accepted. This suggests that there is uni-directional Granger causality.

Therefore, the Granger causality test based on VECM concludes that there is jointly Granger causality running from the exogenous variables, including country risks, trade openness, stock market price and macroeconomic factors to the endogenous variables. This confirms the existence of Granger causality among the variables of specified variables according to the ECTs results.

The results of variance decomposition are consistent with the Granger causality test based on VECM. The variance decomposition of inward FDI in Australia, clearly indicates that most (70.39%) of the variation of inward FDI is explained by its own innovations even after the 10th period. The results of variance decomposition indicate that the economic health, trade openness, stock market price, inflation and

interest rate are relatively strong exogenous in explaining the behaviour of inward FDI flows to Australia economy over 24 months.

The shock forecast error variance of Australian economic health accounts for 4.55% of the variance of inward FDI flows to Australia. The results of forecast error variance decomposition suggest that almost 6.72% of the changes in inward FDI come from the trade openness. The stock market price explains almost 5.48% of the changes in the movements of inward FDI flows to Australia.

The shock of forecast error variance of inflation explains 7.3% of the movements in inward FDI flows to Australian economy. The lower inflation rate in Australia indicates a stable macroeconomic environment, making it an attractive destination for foreign investment. The acceptance of the alternative hypothesis is supported by several studies including those of Rammal and Zurbruegg, (2006), Hasen and Giorgioni (2007) and Trevino et al. (2008).

Rammal and Zurbruegg (2006) select the annual inflation rates (measured as a function of the local consumer price index) as one of the control variables that are regularly used in the FDI literature. The researchers argue that a higher inflation rate in a host country would be a disincentive to invest in that country. The researchers find a negative relationship between annual inflation rates and FDI. This means that an increase in the inflation rate reduces FDI in the host country.

This is supported by Hasen and Giorgioni's (2007) findings. They examine the determinants of FDI inflows to Arab Maghreb Union (AMU) countries. They find that annual inflation rate has a negative effect and significance, which explains why Maghreb countries attract FDI less than do other countries at a similar stage of development.

The shock forecast error variance of Australian interest rate accounts for 11.08% of the variance of inward FDI flows to Australia. This implies that the variance decomposition results support the findings of Granger causality test and VECM in terms of ECT. Also, the findings suggest that economic health, trade openness, stock market price, inflation and interest rate are relatively strong exogenous factors in determining the behaviour of inward FDI.

**H<sub>10a</sub>: The Flows of Inward FDI in Jordan and Australia are not Endogenous over Full Period.**

In the case of Jordan, the Wald tests for the adjustment coefficients of the ECT measure deviations from the long-term disequilibrium. All of the LR tests reject the null hypothesis that the *ith* endogenous variable is weakly exogenous with respect to the  $\beta$  parameters, suggesting that at all three significance levels, the variables are strongly exogenous. This confirms the ECTs results: there is a long-term equilibrium relationship between the specified variables in the system.

In the case of Jordan's specified model, the results show that the R-squared value is 0.63. In other words, the exogenous variables including Jordan's country risk, trade openness and macroeconomic factors explain 0.63 of the behaviour of inward FDI. Therefore, the VAR model is a good fit for examining inward FDI. The results of VECM support the findings of VAR model. The R-squared and adjusted R-squared indicate that the strong explanatory power of the endogenous variable models. The specified model is ranked fourth in explaining the behaviour of other variables.

In the case of Australia's specified model, the results show that the R-squared value is 0.58. In other words, the exogenous variables including Australia's country risk, trade openness and macroeconomic factors explain 0.58 of the behaviour of inward FDI. Therefore, the VAR model is a good fit for examining inward FDI.

The results of VECM support the findings of the VAR model. The R-squared and adjusted R-squared indicate that the strong explanatory power of the endogenous variable models. The specified model is ranked second in explaining the behaviour of other variables.

The Wald tests for the adjustment coefficients of the ECT measures deviations from the long-term disequilibrium. All LR tests reject the null hypothesis, that the *ith* endogenous variable is weakly exogenous with respect to the  $\beta$  parameters, suggesting that the variables are strongly and significant exogenous. This confirms the ECTs results: there is a long-term equilibrium relationship between the specified variables in the system.

### 7.3.2 Determinants of Inward FII Behaviour in Jordan and Australia

Since the specified variables in the system are integrated in the first order I (1), this implies that they have a long-term equilibrium relationship and although they may deviate from this in the short term, it will always be returned to in the long term.

The results of VAR lag order the selection criteria for three tests of specified variables. The maximum possible lag length considered is 11 months for Jordan and 10 months for Australia. The choice was ambiguous because in fact only one lag is needed by the SC and HQ, 11 and 10 lags with the AIC for Jordan and Australia respectively. Further examination finds serial correlation at one lag. Therefore, the 11 and 10 lags length of VAR is selected by the AIC information criterion, since they are not serially correlated.

Therefore, this study makes new contributions to the related past studies and theories as it tests for dynamic long-term balanced relationships by using the Johansen and Juselius approach and VECM and short-term relationships and exogeneity by using the Granger causality test, impulse response functions and variance decompositions. The hypothesis relating to the long-term equilibrium between the specified variables in the system is:

#### **H<sub>8b</sub>: Cointegration Relationships do not Exist in the FII Model for Jordan and Australia.**

According to the results of the Johansen cointegration test (Trace test and Maximum Eigen Value test), the hypothesis of existing cointegrating vectors was accepted (refer Table 6.11). In other words, there are long-term equilibrium relationships between inward FII for Jordan and Australia in terms of their country risk (financial health, economic health and political stability), trade openness, stock market price, macroeconomic environment (inflation and interest rate). More precisely, trace and  $\lambda_{\max}$  tests indicate that there are eight and two cointegrating equations respectively at 1% level of significance in the inward FDI model for Jordan. Also, trace and  $\lambda_{\max}$  tests indicate that there are four and four cointegrating equations respectively at 1% level of significance in the inward FDI for Australia.

The results of ECT of VECM confirm the Johansen cointegration test findings (refer Table 6.12). The adjustment coefficient on ECT of inward FII inflows into Jordan is

negative and statistically significant at 10% level of significance indicating that, when deviating from the long-term equilibrium, ECT has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of a long-term relationship between FII flows, country risks, trade openness, stock market price and macroeconomic factors.

The VECM also shows the speed of the system when the variables interacting in a single system and adjusted R-squared. In case of Jordan, economic health (ER) is ranked first as endogenous variable, followed by stock market price (IS) and interest rate (INT). The specified model of this study is ranked fourth in accounting for the behaviour of other variables.

The results of the ECTs for the country risks' (financial health, economic health and political stability) lagged endogenous variables have a negative ECTs sign, indicating the existence of a long-term equilibrium relationship between Jordan country risks and inward FII. More precisely, the speed of adjustment towards equilibrium for financial health and political stability is insignificant.

On the other hand, the ECT of economic health is cointegrated with the behaviour of inward FII in the long-term at only 1% level of significance. According to ICRG, a high economic health in a host country indicates a stable and healthy economy. Economic health includes high real gross domestic product (GDP), high growth, low annual inflation rate, and high gross national product per head. Relatively speaking, Jordan's economy has a reasonable GDP per head and low inflation rate. The result of the ECT is largely consistent with the findings of (Durham, 2004; Baek, 2006 and De Santis & Lührmann, 2009).

Durham (2004) infers that lagged inward FII flows do not have a positive relationship with economic growth. Also, Durham (2004) investigates the relationship between inward FII flows and economic growth. Durham (2004) uses the data drawn from 80 countries from 1979 to 1998. The researcher finds that inward FII flows have a positive statistically significant relationship with GDP growth. This is consistent with Baek (2006), who indicates the relative importance of the GDP factor in determining inward FII flows to Asian and Latin American

economies. Baek points out that GDP has a significant impact on inward FII inflows to Latin American and Asian economies.

De Santis and Lührmann (2009) verify empirically whether the money to GDP ratio is associated with the net flows inequity securities and net flows in debt instruments. The researchers conclude that higher money to GDP ratio enhances international investment in domestic stock to the detriment of less attractive domestic bonds. This means that GDP is positively associated with inward FII inflows to the host country.

The results of ECTs value for the stock market price and interest rate lagged endogenous variables have a negative sign of significance at 10% level, confirming the existence of a long-term equilibrium relationship for stock market price and interest rate. On the other hand, trade openness, inflation and lagged endogenous variables have a positive sign, confirming that there is no long-term equilibrium relationship for trade openness and inflation. This indicates that Jordan's stock market price and interest rate are cointegrated with the flows of inward FII into Jordan economy. Foreign investors seek efficient financial market in providing information, systemic processes reflecting the really value of their investment.

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Given the Jordanian authorities' strategy of generating economic growth through the private sector, it is important that the financial market has well-established regulations to allow for a functional mobilisation and effective allocation of resources. This would contribute to mobilising domestic financial resources and attracting foreign investments, which should add to economic growth and lead to reduced unemployment and poverty.

The results of zero restrictions on coefficients of cointegrated equations of the VECM also support the findings of ECTs of VECM and Johansen cointegration test findings for the inward FII model in Jordan. As most of the LR tests rejected the null hypothesis that the *ith* endogenous variable did not enter the cointegrating equations significantly, this implies that the inward FII, economic health, trade openness, stock market price and interest rate enter the cointegrating relationships significantly. The null hypothesis of financial health, political stability and inflation cannot be rejected.

This indicates that the financial health, political stability and inflation do not enter the cointegrating equations significantly.

The results of ECTs of VECM confirm the Johansen cointegration test findings. The adjustment coefficient on ECT of inward FII inflows into Australia is negative and statistically significant at 10% level of significance indicating that, when deviating from the long-term equilibrium, error correction term has an opposite adjustment effect and the deviation degree is reduced. The significant error term also supports the existence of a long-term relationship between FII flow, country risks, trade openness, stock market price and macroeconomic factors.

The VECM also shows the speed of the system when the variables interacting in a single system and adjusted R-squared (refer Table 6.12). Trade openness (OP) is ranked first in explaining other variables' behaviour; followed by financial health (FR) and economic health (ER). The specified model is ranked fourth in accounting for the behaviour of other variables; the inflation (INF) model has the lowest explanatory power.

The results of the ECTs for the country risks financial health, economic health and political stability lagged endogenous variables have a negative sign of the ECT, indicating the existence of a long-term equilibrium relationship between Australian country risks and inward FDI. More precisely, the speed adjustment towards equilibrium for economic health is insignificant. The Australian financial health and political stability significantly are cointegrated with the behaviour of inward FDI in the long-term Granger causality at 10% level.

According to ICRG, the high financial risk rate reflects high financial health. Financial health covers the stability of the exchange rate, interest rate, external debt and current account. The acceptance of the alternative hypothesis in terms of the expected theoretical relationship is supported by previous studies related to the financial health of foreign country. Many studies (For example, Chakraborty & Rawlins, 2004; Baek, 2006; Yan, 2007; Ciprian & Mihai, 2008 and De Santis & Lührmann, 2009) indicate that the decision of inward FII is related to the financial health.

It is quite natural for the current account to cause the inflows of FII to foreign economies, or the official settlements account. Once capital mobility is liberalised, the causal relationship can go one way or the other, or both might or might not cause the other depending upon the policy responses to the capital inflows. Yan (2007) examines the causal relationship in the current account and inward FII in the EMEs and developed countries. The researcher finds current account Granger causes the inward FII. This means that foreign investment gives rise to current account imbalance in the case of Brazil. However, regarding aggregated foreign investment, the U.K. shows no causal relationship between current account and inward FII.

Another financial determinant that influences inward FII is the foreign country's external debt. External debt (or foreign debt) is that portion of the total debt in a country that is owed to creditors outside the country. The debtors can be the government, corporations or private households. The debt includes money owed to private commercial banks, other governments, or international financial institutions, such as the International Monetary Fund (IMF) and World Bank. Ciprian and Mihai (2008) studied the behaviour of inward FII in Romania and its external debt using an autoregressive model. Ciprian and Mihai (2008) reported that the increase in Romanian external debt led to more inward FII.

The results of ECTs value for the trade openness, stock market and interest rate lagged endogenous variables have a negative sign and it is significant at 1%, 10% and 10% levels respectively, confirming the existence of long-term equilibrium relationship for trade openness, stock market price and interest rate. Australia attracts massive amount of foreign investment as consequence of the strong and stable Australian economic conditions and the deregulations of industries, such as finance, telecommunications and utilities. Also, the mining industry boom and the liberalisation of air transport ownership rules have made Australia an attractive destination for foreign investment. In 2010, the total foreign investment in Australia was \$2 trillion (Mishra 2013).

The results of zero restrictions on coefficients of cointegrated equations of the VECM also support the findings of ECT of VECM and Johansen cointegration test findings for the inward FII model in Australia. As most of the LR tests reject the null hypothesis that the *ith* endogenous variable does not enter the cointegrating

equations significantly. This implies that the inward FDI, economic health, political stability, trade openness, stock market price and inflation enter the cointegrating relationships significantly. The null hypothesis of financial health, political stability, stock market price and inflation cannot be rejected. This indicates that they do not enter the cointegrating equations significantly.

Having confirmed the existence of cointegration relationships between the specified variables in the system and the rank of the main model Granger causality is applied to identify the exogenous variables. Further, impulse response functions and variance decomposition are undertaken to confirm exogeneity based on VECM. The study examined the following Granger causality questions test: Does Jordan's country risks (financial, economic and political risk rate) Granger cause inward FII flows to Jordan economy? Does Jordan's trade openness Granger cause inward FII flows to Jordan? Does Jordan's stock market price Granger cause inward FII flows to Jordan? Do Jordan's macroeconomic factors (inflation and interest rate) Granger cause inward FII flows to Jordan economy. The study used the Block Exogeneity Wald test with a chi-square statistics to capture the existence of Granger causal relationships when all the specified variables interact in the system. Thus, the hypothesis relates to the short-term causal relationships as follows:

**H<sub>9b</sub>: Causal Relationships Do not Exist in the FII Model for Jordan and Australia.**

The null hypothesis of the Granger causality test of Jordanian financial health and political stability is accepted. This indicates they do not cause the inflows of inward FII to Jordan economy. However, the alternative hypothesis of Jordanian economic health is accepted, indicating that the economic health Granger causes inward FII flows to Jordan at 10% level of significance. The Granger causality results of Jordan country risks suggest that the reverse causality is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional causality between economic health and inward FII.

In the short term, Granger causality relationships Jordanian trade openness is accepted the alternative hypothesis, suggesting that there is Granger causality running from the trade openness to the flows of inward FII to Jordan economy at 5% level of significance. In terms of the reverse causality, the Granger causality results

of trade openness indicate that the reverse causality is rejected since the Wald test statistic is insignificant. This implies that there is uni-directional causality between trade openness and inward FII in Jordan. Nevertheless, the null hypothesis of stock market price Grange causality is rejected. This implies that there is Granger causality running from the stock market price to inward FII in Jordan. The reverse causality of stock market price cannot be rejected at 1% level of significance. This suggests that there is strong bi-directional Granger causality. In other words, inward FII in Jordan is strong exogenous, however, in this research the main focus on the specified inward FII model as endogenous variable.

The results of Granger causality suggest that the alternative hypothesis of inflation rate is accepted, implying that there is Granger causality running from the inflation rate to the flows of inward FII in Jordan. In terms of the reverse causality, there is reverse Grangers causality running from the inward FII in Jordan to inflation rate. In other words, inward FII in Jordan is strong exogenous, however, in this research the main focus on the specified inward FII model as endogenous variable. In the short-term Grange causality, the null hypothesis of interest rate is accepted, indicating that there is no Granger causality direction from the interest rate to inward FII in Jordan. The reverse causality of interest rate cannot be accepted. The reverse causality of interest rate is rejected. This suggests that there is no bi-directional Granger causality.

Thus, the Granger causality test based on VECM concludes that there is jointly Granger causality running from the exogenous variables including country risks, trade openness, stock market price and macroeconomic factors to the endogenous variable, inward FII in Jordan. This confirms the existence of Granger causality among the variables of interest in the system according to ECT results.

The results of variance decomposition are consistent with the Granger causality test based on VECM. The variance decomposition of inward FII in Jordan clearly indicates that most (78.39%) of the variation of inward FII is explained by its own innovations even after the 10th period. The results of variance decomposition indicate that the financial health, political health, stock market price, inflation and interest rate are quite strongly exogenous in explaining the behaviour of inward FII flows to Jordanian economy over a 10-month period.

The shock forecast error variance of Jordan financial risk rate explains 6.27% of the variance of inward FII flows to Jordan. The results of forecast error variance decomposition suggest that almost 18.87% of the changes in inward FII come from the political risk rate. The shock forecast error variance of stock market price explains 9.13% of the variance of inward FII flows to Jordan. The inflation explains almost 6.65% of the changes in the movements of inward FII flows to Jordan. The shock of forecast error variance of interest rate explains 13.43% of the movements in inward FII flows to Jordan economy.

The findings of impulse response functions support the Granger causality test findings based on VECM. The shock of Jordan's country risk (financial health, economic health and political stability) on inward FII persisted positively over the 24-months. This implies that country risks have a uni-directional effect on the flows of inward FII in Jordanian economy. The shock of one standard deviation of trade openness on inward FII flows to Jordan is negative for the first three periods, and then the response of inward FII persists positively after the third month. The response of inward FII to the shock of stock market persists positively. The shock of one standard deviation of macroeconomic environment (inflation and interest rate) on inward FII is negative over the 24 month period. Further, the results of ARCH model support the findings of IRFs in terms of the relationship sign between inward FII and the specified variables.

The null hypothesis of Granger causality test of Australian financial health is accepted as the economic health Granger does not cause the inflows of inward FII to Australian economy. However, the alternative hypothesis of Australian financial health is accepted, indicating that the financial health Granger cause inward FII flows to Australian at 1% level of significance. Also, Granger causality test accepts the alternative hypothesis of political stability; as the political stability does Granger-cause the inflows of inward FII in the short-term into Australian at 10% level of significance economy. The Granger causality results of Australian country risks suggest that the reverse causality is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional between country risks and inward FII in Australia.

Many studies, such as those of Quan and Reuveny (2003), Gelos and Wei (2005), Goldstein and Razin (2006), Kim et al. (2010) and Poshakwale and Thapa (2011), indicate that the decision of inward FII is related to political stability. Kim et al. (2010) explore the relationship between poor corporate governance and the inward FII as well as the impact of the quality of government in attracting foreign investment in Korea. The researchers provide some evidence that improvement in governance attracts more foreign investment.

Mengistu and Adhikary (2011) point out that according to the theory of political economics; governments are the controllers, regulators, and adjudicators of business sectors. Government is also instrumental in creating legislation in order to regulate the economy, structure the competitive environment and establish a regulatory environment in which business is conducted.

In recent research, Poshakwale and Thapa (2011) apply a fixed-effect model and used a set of data for 36 economies with bilateral equity portfolio allocation from investors of 16 developed countries for a period of six years. They examine the relationship between the quality of investor protection and inward FII. The researchers emphasise that regulations and investor protection reflect in the quality of institutions appear to be statistically significant in determining the inward FII. Indeed, the quality and implementation efficiency of legislations and regulations, such as legal protection accorded to foreign investors should be adopted as an important policy to attract a higher level of FII.

The alternative hypothesis is accepted for the Australian trade openness relationship according to the Granger causality test, suggesting that there is Granger causality running from the trade openness to the flows of inward FII to the Australian economy at 10% level of significance. In terms of the reverse causality, the Granger causality results of trade openness suggest that the reverse causality is rejected since the Wald test statistics are insignificant. This implies that there is uni-directional between trade openness and inward FII. The null hypothesis of stock market price Grange causality is rejected. This indicates there is Granger causality running from the stock market price to inward FII. The reverse causality of stock market price cannot be rejected at 1% level of significance. This suggests there is strong bi-directional Granger causality. In other words, inward FII in Australia is strong

exogenous, however, in this research the main focus on the specified inward FII model as endogenous variable.

The results of the Granger causality test suggest that the alternative hypothesis of inflation rate is accepted, implying that there is Granger causality running from the inflation rate to the flows of inward FII. The reverse causality of inflation rate is rejected since the Wald test statistics are insignificant. For the short-term Grange causality, the null hypothesis of interest rate cannot be rejected, indicating that there is no Granger causality direction from the interest rate to inward FII. The reverse causality of interest rate is rejected. This suggests that there is no bi-directional Granger causality.

Therefore, the Granger causality test based on VECM concludes that there is jointly Granger causality running from the exogenous variables including Australian country risks, trade openness, stock market price and macroeconomic factors to the endogenous variable inward FII flows to Australian economy. This confirms the existence of Granger causality among the variables of interest in the system according to the ECTs results.

The variance decomposition of inward FII in Australia, clearly indicates that most (70.11%) of the variation of inward FII is explained by its own innovations even after the 10th period. The results of variance decomposition indicate that the political risk rate, trade openness, stock market, inflation and interest rate are relatively strongly exogenous in explaining the behaviour of inward FII flows to Australia economy over the 24 month period.

The shock forecast error variance of Australian political stability explains 7.74% of the variance of inward FII flows to Australian. The results of forecast error variance decomposition suggest that almost 6.73% of the changes in inward FII come from the trade openness. The shock forecast error variance of stock market price explains 6.73% of the variance of inward FII flows to Australian. The inflation explains almost 10.55% of the changes in the movements of inward FII flows to Australia. The shock of forecast error variance of interest rate explains 8.88% of the movements in inward FII flows to the Australian economy.

This implies that the variance decomposition results support the findings of the Granger causality test and VECM in terms of ECTs. Also, the findings suggest that political stability, trade openness, stock market, inflation and interest rate are relatively strongly exogenous in determining the behaviour of inward FII.

**H<sub>10b</sub>: The Flows of Inward FII in Jordan and Australia are not Endogenous over the Full Period.**

In the case of Jordan, according to the Wald tests for the adjustment coefficients of the ECTs, this measures deviations from the long-term disequilibrium. All of the LR tests reject the null hypothesis that the *ith* endogenous variable is weakly exogenous with respect to the  $\beta$  parameters, suggesting that the variables are strongly exogenous at 10% level of significance. This confirms the ECTs results: there is a long-term equilibrium relationship between the specified variables in the system.

In case of the specified model, the results show that the adjusted R-squared value is 0.8751. In other words, the exogenous variables including Jordan's country risk, trade openness and macroeconomic factors explain 0.8751 of the behaviour of inward FII. Therefore, the VAR model is a good fit for examining inward FDI. The results of VECM support the findings of VAR model. The R-squared and adjusted R-squared indicate the strong explanatory power of the endogenous variable models. The specified model is ranked fourth in explaining the behaviour of other variables.

The exogenous variables in the VAR model including Australia's country risk, trade openness and macro-economic factors explain 0.7033 of the behaviour of inward FII. The results of VECM support the findings of VAR model. The R-squared and adjusted R-squared indicate the strong explanatory power of the endogenous variable models. The specified model is ranked fourth in explain the behaviour of other variables.

#### **7.4 Contributions to Knowledge**

This Section highlights the research contributions made by this study. It is believed to be the first study of its kind in investigates the long-term equilibrium and short-term dynamic relationships between inward foreign investment (FDI & FII) in Jordan and Australia and their country risks (financial health, economic health and political stability), trade openness, stock market price and macro-economic

environment (inflation and interest rate). The study uses the following methods: long-term and short-term relationships between specified variables in the system by using the Johansen approach, VECM, and short-term relationships between specified variables in the system by using Granger causality, impulse responses function and variance decomposition.

The study also contributes to the related literature by showcasing the determinants of foreign investment (FDI & FII) in the short- and long-term. A further contribution of this study is that, after extensive review of the literature, no other study has employed the Johansen cointegration and Granger-causality tests within VAR and VECM dynamic models to explore the above relationships.

The study examines the contemporaneous relationships of specified variables in the system based on the ARCH model by covering three study periods. As a result, this study is able to distinguish between different financial, economic and political conditions. The decision to engage in foreign investment may be explained by the absence or presence of cointegration and causality between the variables.

The study examines the relationships between the inward foreign investment (FDI and FII) and its determinants. Specifically, this study contributes through its investigation of potential benefits produced by healthy financial and economic conditions and stable politics in terms of a country's attractiveness to foreign investors. This line of examination has not previously been addressed in the literature researching causal relationships of determining foreign investment. The results of this study have the potential to improve and enhance foreign investors' decisions by employing cointegration and causality techniques for both long-term and short-term investments.

The variance decomposition and impulse response functions analysis add further support to the Johansen cointegration and Granger Block Exogeneity Wald test results. The current study provides insights into the percentage of forecast error variance and the FDI response to shock of financial health, economic health, trade openness and inflation. In the case of inward FII, variance decomposition indicate that financial health, political health, stock market price, inflation and interest rate

are strongly exogenous in explaining the behaviour of inward FII flows to Jordan's economy.

In the case of Australia, the variance decomposition indicated that economic health, trade openness, stock market price, inflation and interest rate are relatively strong exogenous factors in explaining the behaviour of inward FDI flows to the Australian economy. Further, the variance decomposition indicated that political stability, trade openness, stock market, inflation and interest rate are relatively strong exogenous factors in explaining the behaviour of inward FII flows to Australia economy.

Potentially, this could assist foreign investors when making decisions to invest in a foreign county. Additionally, the study provides policy makers with another point of reference when forecasting the behaviour movements of inward foreign investment (FDI & FII) in a foreign county, which can lead to implementing suitable policy action. The results of this study can be used to clarify the implications of investments as discussed in the next section.

## **7.5 Conclusions**

This study investigates the determinants of foreign investment (FDI & FII), contemporaneous long-term equilibrium relationships, and short-term dynamic relationships in Jordan and compared them with those in Australia's developed economy in order to arrive at some implications for Jordanian policy. The study uses monthly data from 1996 to 2010, including country risks (financial health, economic health and political stability), trade openness, stock market price and macroeconomic environment (inflation and interest rate). Support is provided in this study for all of its hypotheses and therefore for the underlying theory and empirical literature that was utilised to formulate these hypotheses.

Considering the unit root tests including the ADF and the PP test, the results indicate that each of the series is non-stationary when the variables are defined in levels, while first differencing removes time dependency in the data where the first differenced specified variables and errors of these relationships are stationary and integrated in the first order. Therefore, all residuals of the linear combination of first differences are stationary.

The VECM Johansen cointegration test is used to test for the existence of a long-term statistical equilibrium among the variables. Long-term equilibrium relationships are found between inward FDI for Jordan and Australia and their country risk (financial health, economic health and political stability), trade openness, stock market price and macroeconomic environment (inflation and interest rate).

The Granger Block Exogeneity Wald test, ECT analysis, impulse response functions and variance decomposition are conducted to establish existence of causality among variables in the short-term. There is mixed evidence of causal relations between inward foreign investment (FDI & FII) and its determinant variables.

In the case of Jordan, the Granger-causality tests show some evidence of a uni-directional relationship running from financial health, political stability and interest rate to inward FDI, but a bi-directional Granger causality relationship exists between trade openness and inward FDI. In this instance, the stronger causal influence runs from inward FDI to trade openness. The result of the impulse response functions and variance decomposition support the results of the Granger-causality tests. That is, financial health, political stability, trade openness and interest rate have relatively stronger exogeneity in relation to inward FDI than the other specified variables. The results of the variance decomposition support the findings of the Granger-causality tests and ECTs. The results of variance decomposition indicate that financial health, economic health, trade openness and inflation have relatively stronger exogeneity (in that order) in explaining the behaviour of inward FDI flows to Jordan's economy over a 24 month period after the one standard deviation shock is applied to the endogenous variable (inward FDI).

In the case of Australia, the Granger-causality tests only show evidence of a uni-directional relationship running from economic health, trade openness, stock market price and interest rate (in that order) to inward FDI. The result of the impulse response functions and variance decomposition support the results of Granger-causality tests. That is, financial health, political stability and inflation rate have relatively less strength of exogeneity in relation to inward FDI. The results of the variance decomposition basically support the results of Granger-causality tests and ECTs. The results of variance decomposition indicate that the economic health, trade openness, stock market price, inflation and interest rate (in that order) are relatively

stronger exogenously in explaining the behaviour of inward FDI flows to Australia economy over a 24 month period after the shock is delivered to the inward FDI.

In the case of Jordan, the Granger-causality tests show some evidence of a uni-directional relationship running from economic health and trade openness to inward FII, but a bi-directional Granger causality relationship exists between stock market price, inflation rate and inward FII. The stronger causal influence runs from inward FDI to stock market price and inflation rate. The result of the impulse response functions and variance decomposition basically support the results of the Granger-causality tests. That is, financial health, political stability and interest rate have relatively less strength of exogeneity in relation to inward FII. The results of variance decomposition provide some mixed support for Granger causality in that financial health, political stability, stock market price, inflation and interest rate (in that order) have relatively greater strength of exogeneity in explaining the behaviour of inward FII flows to Jordan economy over a 24 month period after the shock is delivered to inward FII.

In the case of Australia, the Granger-causality tests show evidence of a uni-directional relationship running from economic health, political stability, and trade openness and inflation rate to inward FII. However, a bi-directional Granger causality relationship existed between stock market price and inward FII. The stronger causal influence runs from inward FII to stock market price. The result of the impulse response functions and variance decomposition basically support the results of the Granger-causality tests. That is, financial health and interest rate have relatively less strength of exogeneity in relation to inward FII. The results of variance decomposition analyses show mixed support for Granger causality in that they indicate that the political stability, trade openness, stock market, inflation and interest rate (in that order) have relatively stronger exogeneity in explaining the behaviour of inward FII flows to Australia economy over a 24 month period after the shock is delivered to inward FII.

This study provides an important extension to the understanding of the behaviour of foreign investment (FDI & FII) in developed and developing countries. The results suggest that any movements in financial health, political stability, stock market price and the macroeconomic environment can be used to predict the movement of foreign

investment (FDI & FII). Thus, the results offer a clearer picture of foreign investment for those wanting to invest in Jordan and Australia. The next chapter discusses the limitations of the study, future research directions and policy implications and concludes this dissertation.

## **CHAPTER EIGHT**

### **CONCLUSIONS**

#### **8.1 Overview Chapter**

This Chapter presents a summary of the study, including empirical results and the policy issues that emerged. The preliminary objective of this study is to explore the behaviour of inward FDI and FII in Jordan and Australia, using unlagged models. The purpose initially was to examine the behaviour of all variables, including country risks (financial health, economic health and political stability), trade openness, stock market price and the macro-economic environment (as reflected by inflation and interest rate), when interacting within a contemporaneous system. The main objective of this study is to investigate the optimally lagged relationships and compare Jordanian and Australian results. Of central importance is the policy implications for Jordanian inward foreign investment that arise out of the comparison of Jordan and Australia. The Chapter summarises the preliminary and main findings. The Chapter also discusses the limitations of the study, future research directions and Jordanian policy implications.

#### **8.2 Thesis Summary**

The Jordan economy considers inward FDI and FII as one of the most important means of enhancing economic growth, increasing trade, improving the country's technological level and advancing managerial skills. Jordan has succeeded in attracting increasing levels of foreign investment. Since the 1990s, Jordan has taken significant steps to reform its economy and accordingly commenced inclusive financial, economic and political reform programs with the goal of shaping a modern dynamic economy. Policy efforts have been directed at achieving growth, prosperity and political stability.

Jordan has developed a stock market, which helps to mobilise domestic financial resources and attract foreign investments. For example, by the end of December 2008, securities owned by non-Jordanians represented 49.2% of Amman Stock Exchange (ASE) capitalisation, 35.9% of which are owned by Arab investors and 13.3% by non-Arabs. Jordan is an open economy and a signatory to a series of

lateral, bilateral and trilateral trade agreements. Jordan is one of the most liberal countries in the Middle East with a secular government.

Australia, as a developed economy, is used as a comparison to Jordan in examining the determinants of inward FDI and FII to arrive at subsequent policy implications for Jordan. Australia has an AAA international credit rating, with a well-developed, strong and sophisticated financial market, regulated in accordance with international criteria. In terms of global turnover, Australia's foreign exchange market is the seventh largest in the world and the Australian dollar/U.S. dollar is the fourth most traded currency pair globally. In 2011, Australia received over \$2 trillion in total foreign investment stock.

The theory of FDI developed from early trade theory by Smith (1776), Ricardo (1817) who discussed the concept of classical trade theory. Trade theory contends that countries are able to earn if each dedicates resources to the generation of goods and services, which provide an economic benefit (Morgan & Katsikeas, 1997). According to Smith (1776), if there is no government involvement in trade processes and if each individual is left to pursue his own interests, more goods and services will be available, and prices will decrease. Therefore, the wealth of each nation will increase.

Classical trade theory effectively characterises the situation where a country benefits from producing goods and services for domestic consumption and thereafter exporting the surplus. In other words, it is sensible for countries to have an economic disadvantage in importing those goods and services. There are several factors responsible for the economic advantages/disadvantages that may arise from this, including resource endowments, labour, capital, technology and/or entrepreneurship. Therefore, classical trade theory suggests that the basis for international trade can be traced to differences in production characteristics and resource endowments, which are founded on domestic differences in natural and acquired economic advantages.

Smith's theory was offered to replace mercantilism. The theory of comparative advantage (Ricardo, 1817) advances and refines Smith's theory of absolute advantage and concurs with Smith's view. Ricardo's (1817) comparative advantage theory extends Smith's view to the case where one of the two countries has an

absolute advantage in both commodities, and shows that trade is good for both countries (Hill, 2004). In Vernon's (1979) product life cycle model, FDI occurs as part of the parent firm's effort to spread its capability to extract oligopoly rents from an internal array of intangible assets in the face of on-going challenges from competitors.

There are important more recent theories pertaining to FDI and FII, such as the ESP paradigm of Koopmans and Montias (1971) and Dunning's eclectic paradigm (cited in Dunning & Lundan, 2008). There are several ways of characterising a country's specific advantages. One of them is the environment, system, policy (ESP) paradigm. According to their economic environment, economic system and government policies, countries are classified in the ESP paradigm. Here, 'environment' encompasses the resources and capabilities, including a wide range of intangible assets of a particular country as well as the ability of its enterprises to use these to service domestic or foreign markets. 'System' means the macro-organisational mechanism within which the allocation of these resources and capabilities is decided. 'Policy' means the strategic objective of government and the macro-or micro-measures taken by it to implement and advance these objectives within the system and environment of which they are part (Dunning & Lundan 2008).

Dunning's (1980) eclectic paradigm is useful in explaining FDI characteristics and firm specific advantages. The theory offers an analytical base for nearly all studies pertaining to international production and FDI. It is based on internalisation theory by including location-specific factors in various countries in order to help determine foreign investment (Dunning, 1980). The eclectic paradigm indicates that the extent, geography and composition of FDI are determined by interaction of three sets of interdependent variables: ownership, location, and internationalisation advantages. The eclectic paradigm offers an analytical framework that accommodates a variety of operationally testable theories on the determinants of FDI.

The study includes an analysis of FII because it is a different type of foreign investment (much of this being speculative) and considered as a short-term investment. Financial, economic and political factors significantly influence inward FDI and FII and indicate mixed results for different developed and developing host

economies. Internationally, several studies have concentrated on the individual impact of a country's determinants on inward FDI and FII. These studies include Brada et al. (2006), Speed and Kenisarin (2008), Khrawish and Siam (2010) and Cuyvers et al. (2011). On the other hand, previous Jordanian studies (For example, Méon & Sekkat, 2004; Habash, 2007; Khrawish & Siam, 2010 and Sekkat, 2012) have concentrated on inward FDI, using the sub-components of political risk rate and trade openness.

Australian empirical studies (For example, Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer et al., 2009) have focused on the advantages of inward FDI ownership in line with theoretical prediction and testing of variables in studies examining location factors. Other studies have been concerned with determining inward FDI using quarterly and annual data covering short periods. This study differs from the other Jordanian and Australian studies in terms of the period of time for which data was collected, the determinant variables of inward FDI and FII, and the data analysis techniques.

The current study is focused on the determinants of inward FDI and FII during the period 1996 -2010, using monthly data. Also, this study analyses whether or not the basic relationships differ for the three structure break periods using unlagged models in the preliminary analysis stage. This study considers all the determinant factors in Jordan and Australia including: financial, economic and political determinants. The degree of liberalisation or trade openness is considered by using exports and imports as a percentage of GDP as well as stock market prices. Also, the macro-economic environment is considered by controlling for interest rate and inflation.

A number of researchers have studied the dynamic determinants of inward FDI and FII. A few of them have considered the dynamic relationship between all country risk determinants, stock market price and inward FII. Despite the fact that past studies have examined the dynamic movements between foreign investment and part of country risk determinants, trade openness and macroeconomic environment, there is no evidence showing the long-term relationship, short-term relationship and exogeneity between the variables. Past studies (such as, those of Wijeweera & Mounter, 2007; Yaoxing, 2010; Siddiqui & Ahmad, 2011 and Pradhan & Saha, 2011) used the VAR model and Granger causality to determine the long-term

relationship and the direction of causality. A limited number of studies, such as Uctm and Uctm (2011), have considered the structure breaks in the data.

This study differs from other Jordanian and Australian studies. The Jordanian studies (For example, Méon & Sekkat, 2004; Habash, 2007; Bakir & Alfawwaz, 2009; Khrawish & Siam, 2010 and Sekkat, 2012) also focus on the market-seeking advantage, but the testing of variables in studies focuses on the framework policy factors, such as corruption, institutions, quality of governance infrastructure, exports and openness. For instance, these models were based on a short time period (1997-2007) and did not consider a variety of theoretical and econometric techniques, such as dynamic models (involving impulse response, variance decomposition analysis and vector error correction models). Given these mixed results, more evidence is needed from an analysis of recent data, as the financial, economic and political structure in Jordan and internationally has been changing very rapidly, particularly since the onset of the Global Financial Crisis (GFC).

Previous Australian studies (For example, Yang et al., 2000; Faeth, 2005a; Wijeweera & Mounter, 2007 and Iyer, 2009), concentrating on ownership advantages, are in line with theoretical prediction. However, the testing of variables in these studies concentrated on location factors, such as market size, factor costs, transport costs and protection and risk factors. Even the most recent studies had a number of weaknesses. For example, Kirchner's (2012) model was based on a short time period (57 observations 1989: third quarter-2004: fourth quarter) and did not consider a variety of theoretical and econometric techniques, such as dynamic models and analysis of exogeneity. Similarly, more evidence is needed to analyse more recent data and take structural breaks into account.

Based on past studies and theories, the hypotheses of unlagged models are developed based on the three periods of structural breaks to explore the contemporaneous relationships between country risks, trade openness and stock market price, macroeconomic factors and inward FDI and FII in Jordan and Australia. In the case of lagged models, splitting the sample into sub-periods will result in the loss of degrees of freedom and this problem is exacerbated by the relatively long optimal lag of 10 to 11 months decided by information criteria. As a result, the hypotheses of lagged models were developed based on a full period to determine the long-term

balance of relationships and short-term dynamic relationships between the variables of interest.

This study finds that country determinant factors, such as financial health, economic health and political stability have a positive effect on inward FDI and FII. The effect of trade openness is ambiguous, but generally, trade openness influences inward FDI and FII positively. The stock market price reflects financial market and financial institutional development. Also, the stock market price is expected to have a positive effect on inward FDI and FII. The macroeconomic variables, including inflation and interest rate appear to have a negative relationship with inward FDI and FII. These findings are consistent with theory and past evidence if the source of the interest rate rises is inflation.

One of the study's major objectives is to explore the contemporaneous relationship between the specified variables in the system, based on Jordanian and Australian data. The ARCH model is used to compare and contrast the preliminary findings for the entire period and the major structural break in the Jordanian and Australian time series data. Based on the evidence from the ARCH model over the full period from 1996 to 2010, the main determinants of inward FDI in Jordan are economic risk rate, trade openness, inflation and interest rates. In the period 1996 to 2008, economic risk rate, stock market prices and inflation rates were the main drivers of inward FDI in Jordan.

In the case of Australia over the full period (1996-2010), financial risk rate, political risk rate, trade openness, stock market prices and interest rates drive the inflows of inward FDI. In the period up to the major structural break (1996-2008), economic risk rate, trade openness, stock market prices and interest rate are the major factors driving inward FDI in Australia. Regarding the determinants of inward FII, over the full period (1996-2010) and up to the major structural break (1996-2008), political risk rate, stock market prices, inflation and the interest rates are the main determinants of inward FII in Jordan. Economic risk rate, trade openness, stock market prices and inflation rates are found to be statistically significant in driving inward FII in Australia. However, this preliminary analysis does not take account of optimal lags and is undertaken merely to observe how the data behave in contemporaneous scenarios.

For the main analysis, the study uses an econometric approach incorporating optimal lags and that test for cointegration and exogeneity to determine existing long-term and the short-term relationships respectively. The methodology is different from that used by previous studies. To capture the possible time variation in relationships between variables, the study employs the VAR model. Therefore, the study estimates a VECM with Johansen and Juselius' approach to capture the long-term cointegrating relationships. The study utilises the VECM Granger Block Exogeneity Wald test, variance decomposition and impulse response functions (IRF) analysis to capture and verify the short-term exogenous relationships. By combining these techniques, the study analyses the interactions of both long-term and short-term relationships between the specified variables with reliable results. Most findings are at the 1% and 5% levels of statistical significance.

The cointegration tests demonstrate that there are significant long-term equilibrium relationships between the specified variables. This implies that there is the possibility of causality between the variables in the system. The ECTs confirms the existence of a long-term equilibrium relationship. Also, a weak exogeneity test confirms that all the variables were significantly exogenous in the foreign investment models.

In terms of the short-term relationships, the Granger causality test, based on VECM, indicates that Granger causality runs from financial risk rate, political risk rate, trade openness and interest rate to the inward FDI flows to Jordan's economy. The results of IRF confirm the outcomes of the Johansen cointegration test and Granger causality test of the VECM in terms of ECT, indicating that the exogenous variables play a major role in determining inward FDI in Jordan. The results of variance decomposition suggest that financial risk rate, economic risk rate, trade openness and inflation are significantly exogenous in determining the behaviour of inward FDI in Jordan.

With regard to FII in Jordan, in the case of the long-term relationships, the findings indicate that there are significant equilibrium relationships between all variables in the VECM system. The ECTs confirm the existence of a long-term equilibrium relationship between the specified variables. Also, a weak exogeneity test confirmed that all the specified independent variables are significantly exogenous.

Regarding short-term relationships, the Granger causality test based on VECM indicates that exogeneity runs from economic risk rate, trade openness, stock market price and inflation to the inward FII flows to Jordan's economy. As risk is a proxy for economic health, the economic health included real gross domestic product (GDP), growth, the annual inflation rate, and gross national product per head. That is, higher GDP growth, lower inflation and higher GDP per capita are associated with higher inward FII. It is clear that greater economic health encouraged higher inward FII flows. The results of IRF confirmed the outcomes of the Johansen cointegration test and Granger causality test of the VECM in terms of ECT and show that exogenous variables play a major role in determining inward FII in Jordan. The results of variance decomposition support the contention that financial risk rate, political risk rate, stock market price, inflation and interest rate are significant exogenous variables in determining the behaviour of inward FII.

When determining inward FDI and FII in Australia, the study examines the long-term and short-term relationship between inward FDI. In the case of long-term relationships, the findings indicate that there are significant long-term equilibrium relationships between all variables in the VECM system. This implies that there is the possibility of causality between the specified variables in the system. The ECTs confirmed the existence of long-term equilibrium relationships between the specified variables for inward FDI in Australia. Further, a weak exogeneity test confirms that all the variables are significantly exogenous.

In the case of short-term relationships, the Granger causality test based on VECM indicated that there is Granger causality running from the exogenous variables including economic risk rate, trade openness, stock market price, interest rate to inward FDI flows into the Australian economy. The results of IRF confirm the outcomes of the Johansen cointegration test and Granger causality test of the VECM in terms of ECTs and indicate that these variables play a major role in determining inward FDI in Australia. The results of variance decomposition suggest that economic risk rate, trade openness, stock market price, inflation and interest rate were significantly determining the behaviour of inward FDI in Australia.

In the case of the long-term relationships in Australia, the findings indicate that there are significant equilibrium relationships between all specified determinants of inward

FII in the VECM system. This implies that there is the possibility of causality between the specified variables in the system. The ECTs confirm the existence of a long-term equilibrium relationship between the specified variables. Also, a weak exogeneity test confirms that all the variables are significantly exogenous.

Regarding the short-term relationships in the Australian system, the Granger causality test based on VECM indicated that there is Granger causality running from the specified exogenous variables including economic risk rate, political risk rate, trade openness, stock market price and inflation to the inward FII flows to Australian economy. The results of IRF confirm the outcomes of the Johansen cointegration test and Granger causality test of the VECM in terms of ECT, indicating that these variables play a major role in determining inward FII in Australia. The results of variance decomposition suggest that political risk rate, trade openness, stock market, inflation and interest rate are highly significant in determining the behaviour of inward FII into Australia.

### **8.3 Research Limitations**

To contain the scope of the current study, only the totals of inward FDI and FII equity and debt have been included. Other types of foreign investment have not been disaggregated, including horizontal FDI, platform FDI and vertical FDI. The study investigated the determinants of inward FDI and FII over the last 15 years of foreign investment that flowed up to December 2010. The results may have an upward bias because of the study's scope of considering only aggregated inward foreign investment by debt and equity.

The study had limited access to the data of foreign investment flows to Jordanian and Australian sectors, such as banking, services, industries and insurance sectors. Another limitation is that the study could not split the data of the main analysis into different structural break periods. It was decided in the case of the lagged models that smaller samples of sub-periods with long optimal lags would detract from the statistical significance of the results. The GDP quarterly data was converted to monthly data (since all the other data were available monthly), by using the Chow and Lin (1971) procedure. Several researchers, such as Bernank and Mihove (1995);

Gerdesmeier and Roffia (2003) and Hussain, (2009) have applied the Chow and Lin technique to convert quarterly GDP data to monthly.

The study focused on the effect of country risks, trade openness, stock market price and macro-economic environment to determine the behaviour of foreign investment, without including the sub-components of financial, economic and political risk rate, such as foreign debt as percentage of GDP, exchange stability, current account as percentage of GDP, corruption, socio-economic pressures, external and internal conflict. The inclusion of such data is beyond the scope of this study, but such a breakdown of data may be used in future research. More extensive analysis of inward FDI and FII and the characteristic environment of a foreign country must be carried out to arrive at more conclusions that will further attract foreign investors. Hence, the results are limited by data availability and many study issues are open for further investigation to be taken into account as discussed in the next section.

There might also be a concern about multicollinearity between financial risk rate, economic risk rate variables, inflation and interest rate. However, because these independent variables are not perfectly positively or negatively correlated, they are all included in the one system in order to provide maximum explanatory power. Thus, the model output can explain the inflows of inward foreign investment as being influenced by economic risk rate, political risk rate, trade openness, stock market price and macroeconomic environment.

#### **8.4 Future Research Directions**

To improve the study models and results, this section suggests some recommendations for further studies. There are very few studies that examine inward FDI and FII in Jordan and Australia using other analytical methods, such dynamic panel methodology. Research on inward FDI and FII in Jordan and Australia has increased in recent years, but many questions remain unanswered. In this study, the dynamic time series models are used to determine the behaviour of inward FDI and FII into Jordan and Australia during 1996-2010. The following section suggests some areas that could be of interest for future study.

Empirical studies on foreign investment appear to focus on the developed countries (both host and home countries). Future studies on the determinants of foreign investment could focus on home and host developing countries, such as foreign investment flows between Jordan and the Middle East Countries. This is to investigate the foreign investment trend in the Middle Eastern region and consider the possible factors affecting the flow of foreign investment into those countries with similar economic structures including labour costs, level of technology and similar culture, but with different natural resources.

It may be useful for policy makers in the two regions to develop their inward FDI and FII environments to complement each other. In addition, results may improve the relationship between Jordan and the Middle East countries, such as protecting the unfair and inequitable treatments in their dealings with other foreign investors from the developed countries. Foreign investment studies can also be expanded in the context of Jordan, Australia or other developing and developed countries situations, such as further investigations into investment climate, trade barriers, and regional integration. This may provide a preliminary analysis of investment barriers and motivations for the inflows of inward FDI and FII.

Beside economic factors, political factors should also be considered in order to conduct an in-depth analysis of these variables on the inflow of inward FDI and FII. Future studies can analyse the effects of relationships between Jordan and other governments and their domestic/international firms. The results can be used to compare Jordan's investment policies and practices with those of other countries, which can provide a basis for upgrading Jordan's investment performance. Regional and/or national social factors, such as changes in education, legislation in the workplace, improved healthcare, changes in local people's attitudes, population growth, and income distribution can be integrated into future studies. This can improve the government's social policy aimed to maximise the benefits from FDI to increase the nation's welfare.

Also, the sub-components of financial risk rate, such as external debt and current account, economic risk rate, such as budget balance as a percentage of GDP and current account as a percentage of GDP, political risk rate, such as government

stability, government quality, rules of law and adequate protection of property for different forms of inward FDI and FII.

Future research may consider adding other economic integration regions, such as Bilateral Investment Treaties (BITs) and Free Trade Agreement (FTA), into the models. This includes investigating the impacts of BITs and FTA on FDI in Jordan and Australia or other developed and developing host countries. In addition, it will be interesting to employ other variables, such as transmission channels as in freight rates, transaction fees, or restriction of monetary transfers. This will be useful for policy purposes.

It will also be useful to examine the inflows of inward FDI and FII in different kinds of industries, such as the automotive and parts, textile, insurance, banking, chemical and pharmaceutical, and manufacturing industries. Considering these inflows will help domestic investors, foreign investors, and policy makers to understand the nature of the industries better, as they will be able to measure the level of resources of each industry. The studies of specific industries will allow policy makers to develop better strategies to attract greater inflow of FDI into Jordan and Australia. Similar studies in other industries will enable investors and policy makers to measure the level of resources in order to increase the attractiveness of inward FDI and FII.

Finally, future research might consider modelling; for example, governance of host and home countries, capital market development, special concessions/privileges for foreign investors, environmental regulations, and factors that may be significant drivers of inward FDI and FII. This will provide more robust policy implications.

### **8.5 Summary of Main Findings**

These findings are again summarised as they lead to the important policy implications for inward Jordanian foreign investment. Despite the limitations of this study, it has achieved its main objectives. The preliminary findings support the main findings, underlying theory, and past studies. The ARCH model is an unbiased and efficient model that effectively explains contemporaneous relationships and provides an indication of the behaviour of the data used. The study primarily examines the

long-term and short-term relationship/behaviour of inward FDI and FII flows to Jordan and Australia. Further, it determines the effect of country risks (financial health, economic health and political stability) trade openness, stock market price, and macroeconomic factors (inflation and interest rate) on the movement of inward FDI and FII. Australia is introduced to compare the determinants of inward FDI and FII in Jordan with those in Australia's developed economy, in order to arrive at some policy implications for Jordan.

In the case of the long-term relationship, Johansen and Juselius methods and VCEM are applied to capture the long-term equilibrium relationships between the specified variables in the system. Also, a weak exogeneity test is applied to determine weak and significantly exogenous variables in the system, and significance of zero restrictions is employed to capture the significant entrance the cointegration equations test. In the case of the short-term relationships, Granger causality, impulse responses function and variance decomposition are conducted, based on VECM.

The main determinants of inward FDI flows to Jordan based on the long-term equilibrium relationships and ECT techniques are political stability, trade openness and inflation rate. In the short term, financial health, economic health and trade openness are the main determinants of inward FDI flows to Jordan. This study confirms the previous findings of determinants of inward FDI. Thus, observations of long-term equilibrium movements of political stability, such as protection of property rights, voice and accountability government, low corruption, transparency and legislations and trade openness can be used in making FDI decisions in Jordan.

According to long-term equilibrium relationships and ECT techniques findings of determinants of inward FII flows, economic health, stock market price and interest rate are the major factors influencing inward FII flows to Jordan. The main findings of short-term dynamic techniques are the same findings as those of the long-term techniques besides political stability and inflation rate. Hence, the short-term dynamic movement of economic health (for example, real gross domestic product (GDP), growth, the annual inflation rate, and gross national product per head) were important for making FII decisions in Jordan.

The main determinants of inward FDI flows to Australia, by using the long-term equilibrium relationships and ECT techniques, are economic health, trade openness, stock market price and inflation rate. The main findings of the short-term dynamic techniques are the same as those of the long-term techniques, a part from interest rate. The results of variance decomposition and impulse response support the results of Granger causality tests, indicating that economic health, stock market price are significantly exogenous in relation to inward FDI.

The results of long-term techniques of determinants of inward FII in Australia indicated that financial health, political stability, trade openness, stock market price and inflation rate are the major factors driving inward FII. The results of short-term dynamic movement indicate that determinants of inward FII are similar to the long-term equilibrium results, excluding the effect of trade openness. Hence, the long-term and short-term dynamic movement of financial health (the stability of exchange rate, interest rate, external debt and current account) and political stability were important factors when making decisions about FII in Australia.

The results of the study are intended to encourage policy makers and foreign investors to pay attention to foreign characteristics, such as financial health, economic health and political stability and their sub-components. The evidence of the long-term cointegration and short-term Granger causality suggest the possibility of switching the decision around foreign investment from the long-term investment to short-term investment vice versa. The underlying principles of International Trade theory, Dunning's Eclectic Paradigm (1980) and the ESP Paradigm of Koopmans and Montias (1971) and past evidence in this field are supported by the findings of this study.

## **8.6 Policy Implications**

The results show some of the most important factors considered by foreign investors when deciding on investment in a foreign country. Also, the results of the study are intended to encourage policy makers in Jordan and foreign investors to pay attention to economic health, political stability, trade openness, stock market price and macroeconomic environment, when making long-term and short-term investment

decisions. If policy makers and investors know that economic health, political stability, trade openness, stock market price and macroeconomic environment have a statistically significant impact on both long-term and short-term inward FDI and FII, they will pay attention to the behaviour of these factors when making investments in a foreign country.

The study provides a detailed examination of how inward FDI and FII interact according to the different characteristics of foreign countries. The results assist foreign investors and policy makers to reduce and avoid the risks of foreign country (as part of financial risk ratings and financial health). The aim of policies for attracting FDI is to provide investors with an environment in which they can conduct their business successfully and without experiencing unnecessary risk. New policy implications for attracting foreign investment in Jordan could be implemented based on the results of the Australian case in this study.

The financial health and the sound structure of the financial system drives the flows of inward FDI and FII to the Australian economy. Australia has been very successful in attracting foreign investment, particularly towards its resources sector. Jordan's main industries are in services (including medical services and tourism) and in the mining sector (fertiliser products). It is recalled that the specific drivers of inward FDI into Australia in order of importance are economic health, trade openness, stock market and inflation rate. The specific drivers of inward FII into Australia in order of importance are political risk rate, trade openness, stock market, inflation and interest rate. Policy recommendations for Jordan should relate to the necessary macro and microeconomic reforms that will complement and enhance Jordan's business environment. Based on this result and in order to attract inward FDI and FII, the government of Jordan should establish a global financial service institution opportunity in its rapidly expanding domestic market Jordan is an ideal location for servicing markets in the Middle East time zones, building strong regulatory environment and financial sector expertise, and firmly establishing the country as a financial centre in the region. Hence, the government of Jordan should take a number of initiatives to support this vision.

In addition, there should be simplification of Jordan's financial services regulations, and further negotiation mutual recognition agreements with key international and

regional markets. The government of Jordan should have a panel of experts comprising financial sector representatives, leading academics and senior government officials to identify barriers to inward and outward investment and develop policies that will help Jordan to achieve its full potential as a financial centre.

The political stability (for example, protection of property rights, voice and accountability government, low corruption, transparency and legislations) is one of the factors influencing the inflows of FDI and FII to Australian economy. Hence, the following policy implications should be considered. The Jordanian government should actively encourage and support foreign investment that is consistent with its national interest, regardless of the source country, through a range of services programs and legislative amendments, aimed at simplifying and streamlining the screening process for foreign investment proposals. The Jordanian political system and regulatory environment should be open and progressive in providing investors with a high degree of confidence and certainty.

The Jordanian government's commitment should be to continuous improvement in areas, such as intellectual property reform and a business-focused regulatory environment. The Jordanian government should also focus on greater labour market flexibility, trade liberalisation, industry deregulation, reductions in tariff barriers and the development of a better tax system, all of which may result in strong productivity and enabling businesses to be highly responsive to economic conditions.

The government of Jordan should also provide active support to Jordanian industry to take advantage of emerging opportunities in the Region and globally. Another important policy implication based on Australian trade openness should be taken into account. That is, government of Jordan should work to reduce import taxes and customs duties and, in some cases, use export taxes as FDI incentives, for example, where export processing zones are not accessible to domestic enterprises. Jordan's government should create a stable macro-economic environment, including access to international trade and removing obstacles to achieve this.

A large body of evidence shows that investors are principally motivated by the quality of a host country's enabling environment. Hence, policies to enhance macro-

economic stability, transparency, other elements of good governance, openness to trade, infrastructure and the levels of knowhow in the domestic economy are all potent tools for attracting investors.

## Appendix A

**Table A.1: Vector Error Correction Model Results (FDI Jordan)**

Equations	FDI Equation		FR Equation		ER Equation		PR Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.39633	-3.80***	-0.0020	-1.3845	-0.0006	-0.2364	0.00389	1.92048*
<b>FDI</b>	0.028854	0.24187	-1.04E-05	-0.05821	0.000392	1.35717	-1.69E-04	-0.73722
<b>FR</b>	149.526	1.76694*	-0.10581	-0.79387	-0.07219	-0.33615	0.080353	0.47284
<b>ER</b>	66.37688	1.78973*	0.019256	0.32599	-0.23995	-2.52119***	-0.0886	-1.17638
<b>PR</b>	5.762469	0.10429	0.076401	0.91949	-0.11337	-0.84685	0.035194	0.33222
<b>OP</b>	0.019522	0.17641	7.69E-05	0.46215	-7.48E-05	-0.27910	0.000127	0.60088
<b>IS</b>	0.006839	0.04957	-9.29E-05	-0.44804	-0.00075	-2.25369**	-3.31E-05	-0.12500
<b>INF</b>	-16.4952	-0.33473	0.068391	0.92291	0.21149	1.77136*	-0.07515	-0.79541
<b>INT</b>	-347.812	-1.75395*	0.289009	0.94156	0.497097	1.00516	-0.22541	-0.57599
<b>R-squared</b>	0.64574		0.4926		0.77578		0.46702	
<b>Adjusted</b>	0.24152		-0.086		0.51995		-0.14112	

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

**Table A.1 (continued): Vector Error Correction Model Results (FDI Jordan)**

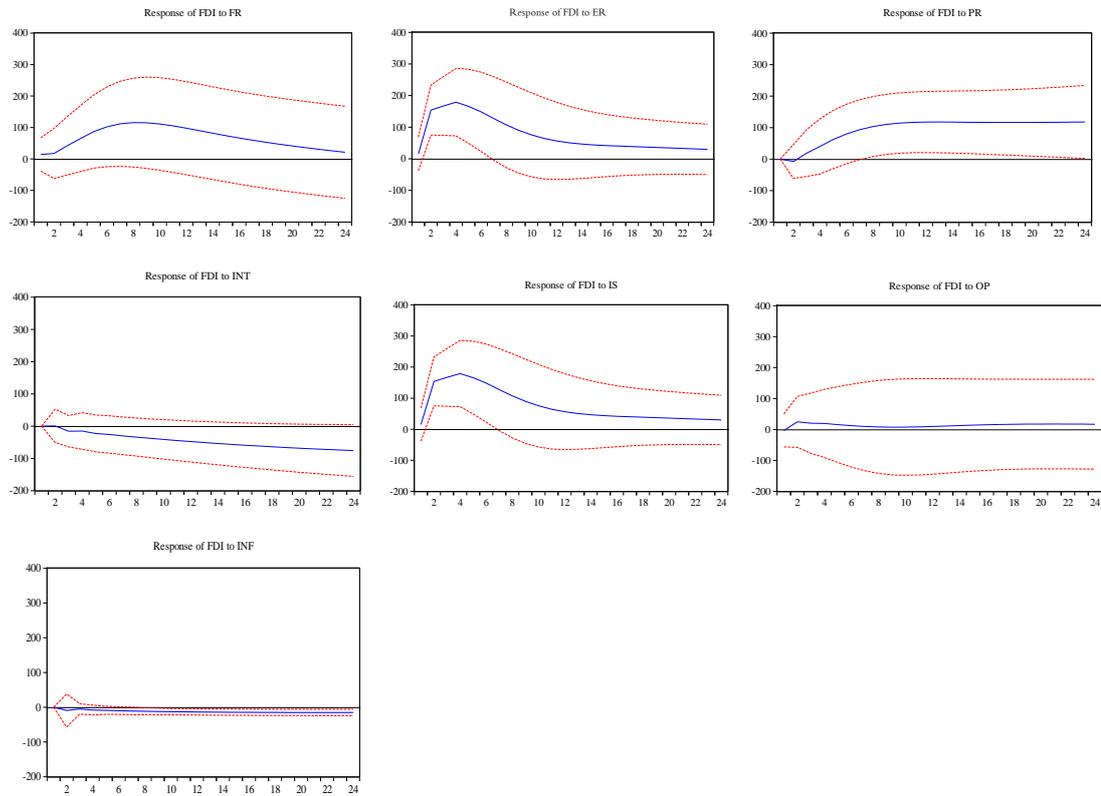
Equations	OP Equation		IS Equation		INF Equation		INT Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.2054468	-2.11253**	0.31368	0.2884	-0.00392	-1.7523*	-0.31368	0.00012
<b>FDI</b>	-0.0409	-0.35034	-0.07513	-0.64217	-0.0409	-0.35034	-0.07513	0.2376
<b>FR</b>	34.82201	0.40149	-91.3061	-1.05033	34.82201	0.40149	-91.3061	-1.05033
<b>ER</b>	-20.9503	-0.54504	13.67819	0.35504	-20.9503	-0.54504	13.67819	0.35504
<b>PR</b>	14.42758	0.26685	27.74434	0.51197	14.42758	0.26685	27.74434	0.51197
<b>OP</b>	-0.00242	-0.02235	0.120312	1.10857	-0.00242	-0.02235	0.120312	1.10857
<b>IS</b>	0.000478	0.00354	0.287532	2.12515*	0.000478	0.00354	0.287532	2.12515*
<b>INF</b>	-142.419	-2.9535***	-52.847	-1.09345	-142.419	-2.9535***	-52.847	-1.09345
<b>INT</b>	-74.6099	-0.37355	-117.828	-0.58858	-74.6099	-0.37355	-117.828	-0.58858
<b>R-squared</b>	0.65955		0.69356		0.606161		0.62881	
<b>and Adj</b>	0.27109		0.34391		0.15678		0.20527	

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

**Figure A.1: Inward FDI in Jordan Response to Cholesky One S.D Innovations  $\pm$  2 S.E**



**Table A.2: The Results of Variance Decomposition Analysis of Inward FDI in Jordan**

Explaining Movements in	Period	S.E	FDI	FR	ER	PR	OP	IS	INF	INT
<b>FDI</b>	<b>1</b>	366.1698	100							
	<b>10</b>	403.4892	85.17938	2.782992	1.980094	2.453378	3.179718	6.848414	10.04332	1.301379
	<b>15</b>	413.0869	81.27866	8.044758	5.392953	2.916002	5.250934	6.134971	11.49843	1.875872
	<b>24</b>	448.6218	71.41071	10.2258	5.56997	4.066012	5.421533	6.489126	10.9107	1.939543
<b>FR</b>	<b>1</b>	0.531549	0.855777	76.16023						
	<b>10</b>	0.986927	1.30088	76.16023	23.21104	5.363566	0.594366	1.957977	1.259863	8.096179
	<b>15</b>	1.129512	4.680641	68.40175	15.34567	16.37376	1.436745	7.960897	4.854352	8.454889
	<b>24</b>	1.260721	6.52492	58.21613	12.60288	13.6886	2.748766	17.91352	7.34776	6.948087
<b>ER</b>	<b>1</b>	0.933377	5.164118	0.494228	94.34165					
	<b>10</b>	1.746684	6.303262	7.716325	41.90779	2.452312	1.603428	33.30397	13.68801	1.318342
	<b>15</b>	1.905476	20.55003	8.641493	38.99578	4.419089	7.705771	21.91991	15.11637	1.235199
	<b>24</b>	2.169102	22.00187	6.350346	33.61435	3.424375	6.617821	16.19082	17.43398	5.346948
<b>PR</b>	<b>1</b>	0.668153	0.322384	0.011796	1.469509	98.19631				
	<b>10</b>	1.292863	4.541229	1.852098	6.235246	75.95782	3.361476	14.28397	9.44251	3.423529
	<b>15</b>	1.489564	5.320257	6.416102	5.327081	64.58853	3.383895	19.52176	10.91279	5.475865
	<b>24</b>	1.675887	6.388915	6.233842	4.968326	56.85994	3.122238	21.17874	10.64534	7.710771

**Table A.2 (continued): The Results of Variance Decomposition Analysis of Inward FDI in Jordan**

Explaining Movements in	Period	S.E	FDI	FR	ER	PR	OP	IS	INF	INT
<b>OP</b>	<b>1</b>	355.6645	1.110111	0.019705	0.189776	0.020407	98.66			
	<b>10</b>	384.3279	5.66054	3.502557	3.210502	2.528019	88.16815	1.926658	2.00012	3.309819
	<b>15</b>	396.6858	12.23074	4.698128	4.188189	3.054139	83.0971	2.068361	4.180748	3.351181
	<b>24</b>	410.433	11.89406	7.023548	4.493684	3.128538	77.86179	2.233523	4.362791	3.354613
<b>IS</b>	<b>1</b>	361.4113	0.666361	0.097681	1.678864	0.122575	0.032512	97.40201		
	<b>10</b>	1055.377	6.453062	10.04262	3.336255	1.345905	8.948872	78.82998	12.10046	0.511921
	<b>15</b>	1230.515	9.385447	9.677938	9.726938	4.823641	10.08849	67.41168	10.77103	1.641259
	<b>24</b>	1363.95	14.0576	9.315724	9.005082	4.506316	9.467213	57.2609	10.27577	2.068882
<b>INF</b>	<b>1</b>	0.902999	7.409366	0.178933	0.726652	0.028372	0.020391	9.221421	82.41487	
	<b>10</b>	2.013457	5.811374	10.19088	5.739837	0.641639	4.885446	21.78243	61.64283	1.11213
	<b>15</b>	2.592061	10.93518	7.32262	17.27716	1.252406	4.922542	12.79024	52.61056	3.224991
	<b>24</b>	3.286823	9.087469	9.442706	16.02509	1.639301	4.023035	12.23254	49.83626	5.073756
<b>INT</b>	<b>1</b>	0.190745	4.292562	0.004751	0.216314	1.781648	0.01492	0.496686	0.907477	92.28564
	<b>10</b>	0.288162	13.20931	3.043456	3.264968	2.812698	2.242221	4.224887	1.080601	76.34075
	<b>15</b>	0.352275	15.76163	2.463898	9.099098	2.198499	1.934468	4.69077	0.667614	73.51038
	<b>24</b>	0.415461	10.16335	2.375249	8.542882	8.098412	3.005958	14.50815	2.929083	70.12186

**Table A.3: Vector Error Correction Model Results (FDI Australia)**

Equations	FDI Equation		FR Equation		ER Equation		PR Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.2013*	-1.7867*	-0.1215	-0.67807	-0.2545*	-1.80364*	-0.1385	-0.95755
<b>FDI</b>	-0.04414	-0.41837	8.7807	0.05488	8.4006	0.66191	-1.5305	-1.17681
<b>FR</b>	79.692*	1.94038*	-0.1936*	-1.851343*	0.147816*	1.75622*	0.084818	0.81659
<b>ER</b>	17.616	0.16961	-0.06813	-0.43916	0.133419	1.08376	0.134733	1.06956
<b>PR</b>	60.5095*	1.75535*	-0.02095	-0.17127	0.156628*	1.81395*	0.08157	0.82142
<b>OP</b>	-14.4543	-0.10311	-6.17077	-0.29043	-19.089	-1.13225	-0.41951	-0.02432
<b>IS</b>	10.868	0.63110	-0.00115	-0.44216	0.002348	1.13355	-0.00099	-0.46618
<b>INF</b>	-94.848	-0.65785	-0.10182	-0.46579	0.047026	0.27112	0.306225*	1.78536*
<b>INT</b>	-14.665	-0.35421	-0.39575	-0.65702	0.802375*	1.87880*	0.10899	0.22285
<b>R-squared</b>	0.612494		0.599749		0.60857		0.468731	
<b>and Adj</b>	0.170339		0.143053		0.161939		-0.13746	

\*\*\*indicate statistical significant at 1% level  
 \*\*indicate statistical significant at 5% level  
 \*indicate statistical significant at 10% level

**Table A.3 (continued): Vector Error Correction Model Results (FDI Australia)**

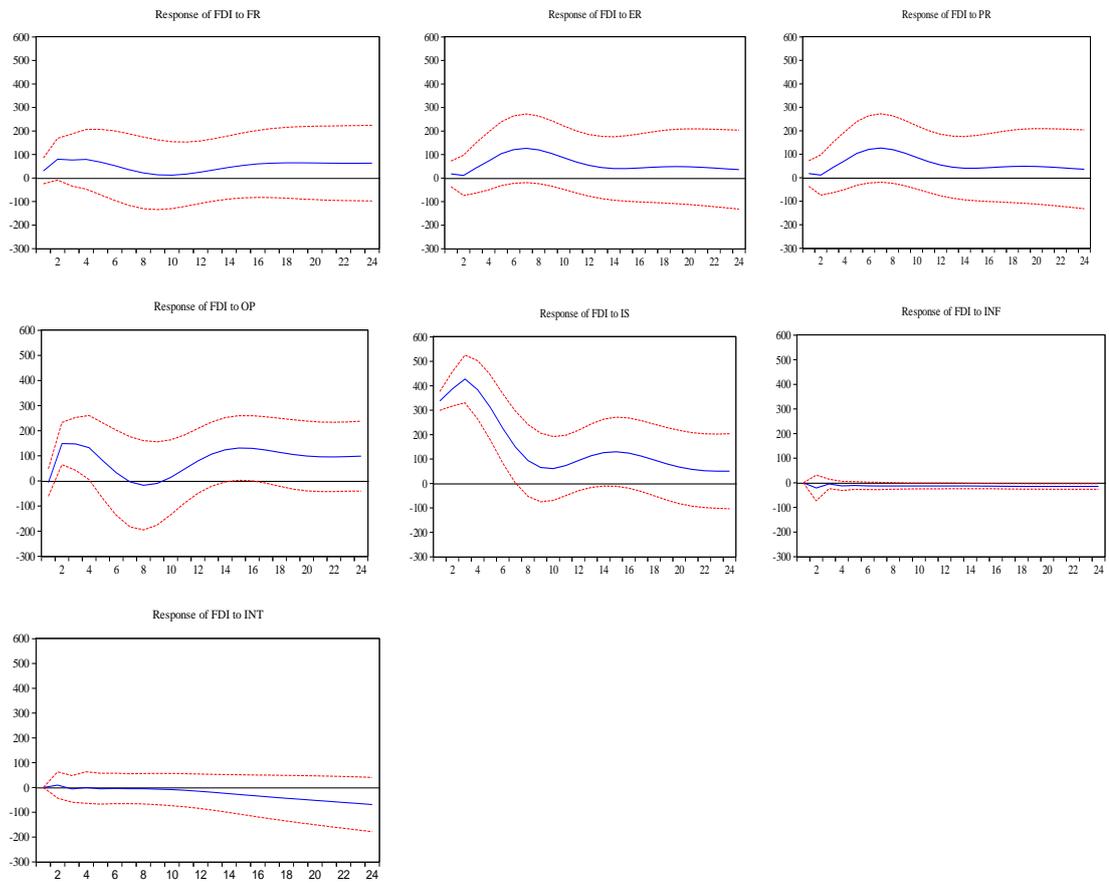
Equations	OP Equation		IS Equation		INF Equation		INT Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.4660***	-5.501***	-0.0011*	-1.771*	0.66306	0.73682	-0.5250*	-1.7585*
<b>FDI</b>	6.0508	0.79310	-0.00112	-1.46130	6.0508	0.79310	-0.00112	-1.46130
<b>FR</b>	0.001146*	1.87873*	-2.81617	-0.45946	0.001146*	1.87873*	-2.81617	-0.45946
<b>ER</b>	0.00053	0.71783	2.108298	0.28362	-0.00053	-0.71783	2.108298	0.28362
<b>PR</b>	0.00018	0.31050	-7.75107	-1.32273	-0.00018	-0.31050	-7.75107	-1.32273
<b>OP</b>	-4.371***	-4.3128***	-232.671	-0.22855	-4.3701***	-4.3128***	-232.671	-0.22855
<b>IS</b>	7.1606	0.57505	0.032	0.25588	7.1606	0.57505	0.032	0.25588
<b>INF</b>	-0.001335	-1.28145	0.546784	0.05221	0.001335	1.28145	0.546784	0.05221
<b>INT</b>	-0.004188	-1.45857	-22.9622	-0.79565	0.004188	1.45857	-22.9622	-0.79565
<b>R-squared</b>	0.76226		0.51037		0.76226		0.51037	
<b>and Adj</b>	0.490992		-0.04831		0.490992		-0.04831	

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

**Figure A.2: Inward FDI in Australia Response to Cholesky One S.D Innovations  $\pm 2$  S.E**



**Table A.4: The Results of Variance Decomposition Analysis of Inward FDI in Australia**

Explaining Movements in	Period	S.E	FDI	FR	ER	PR	OP	IS	INF	INT
<b>FDI</b>	<b>1</b>	6716.847	100							
	<b>10</b>	8547.084	90.31942	0.401922	1.218275	0.970791	0.760311	1.325181	2.164794	2.839305
	<b>15</b>	9206.487	73.25858	1.033623	3.877781	1.564261	3.424161	3.251425	3.828059	10.76211
	<b>24</b>	9925.427	70.39912	1.834411	4.556287	1.61063	6.723752	5.481649	7.313691	11.08046
<b>FR</b>	<b>1</b>	1.028293	0.08417	99.91583						
	<b>10</b>	1.201363	2.036554	74.76946	4.594686	4.542747	3.091609	0.483676	3.061889	7.419379
	<b>15</b>	1.291162	3.082519	57.88981	6.966499	4.350057	4.250894	8.424669	5.786791	9.248762
	<b>24</b>	1.404006	3.639283	52.1195	9.215713	5.551976	5.936916	8.358547	6.663808	8.514251
<b>ER</b>	<b>1</b>	0.868327	0.190406	17.3435	82.46609					
	<b>10</b>	1.03726	0.971823	20.9113	60.60393	3.881227	2.94073	5.635593	0.700719	4.354677
	<b>15</b>	1.090883	2.350053	18.68084	51.0298	8.135499	3.836515	7.966443	2.573271	5.427573
	<b>24</b>	1.142609	2.436177	16.66773	47.39584	7.5683	4.894723	10.06306	5.181388	5.792783
<b>PR</b>	<b>1</b>	0.843008	0.580364	1.027478	0.266726	98.12543				
	<b>10</b>	0.957507	3.179326	4.709471	5.564977	76.64895	3.011855	3.791784	1.962071	1.131562
	<b>15</b>	0.984505	3.129555	5.439727	8.065391	68.1766	3.551399	5.900914	4.15773	1.578687
	<b>24</b>	1.026397	3.402519	6.668893	8.827582	63.52927	4.800806	6.514814	4.533676	1.722444

**Table A.4 (continued): The Results of Variance Decomposition Analysis of Inward FDI in Australia**

Explaining Movements in	Period	S.E	FDI	FR	ER	PR	OP	IS	INF	INT
<b>OP</b>	<b>1</b>	0.005978	0.217697	3.618644	0.111893	0.03022	96.02155			
	<b>10</b>	0.007259	2.095842	9.596116	3.456799	0.104794	82.4713	0.934588	0.42548	0.915084
	<b>15</b>	0.007563	2.541411	10.87474	3.147741	1.375192	71.30805	5.47614	2.755008	2.521713
	<b>24</b>	0.008008	3.64993	10.34163	3.740722	2.032225	68.67888	5.255037	3.116171	3.185403
<b>IS</b>	<b>1</b>	49.52201	0.011526	8.346278	1.195851	0.039053	5.172361	85.23493		
	<b>10</b>	57.25816	2.311527	7.914004	3.13372	6.149135	7.404308	70.59107	1.774985	0.721248
	<b>15</b>	58.6127	2.316622	7.564769	3.572722	8.051508	7.007668	63.62315	3.312198	4.551364
	<b>24</b>	61.85662	2.422412	7.385435	4.620627	8.727585	7.433949	58.76204	4.1003	6.54765
<b>INF</b>	<b>1</b>	0.509552	0.339228	4.29643	1.168355	0.135991	0.094456	0.43355	93.53199	
	<b>10</b>	0.549696	0.797469	5.742062	1.639122	3.2684	0.635835	0.995789	82.50685	4.414479
	<b>15</b>	0.582671	2.40885	6.263713	4.025527	6.065288	0.976035	2.212788	72.13748	5.910324
	<b>24</b>	0.595592	2.242629	6.387444	5.678194	5.724196	1.566452	3.81785	68.89386	5.689374
<b>INT</b>	<b>1</b>	0.246531	0.013525	0.9829	0.017195	0.400421	0.562597	0.782406	2.216582	95.02437
	<b>10</b>	0.279419	1.616966	4.316311	0.292359	0.356551	1.949109	2.087633	13.29091	76.09016
	<b>15</b>	0.288084	2.848696	4.53193	1.189158	1.081219	3.638528	2.378958	15.14754	69.18397
	<b>24</b>	0.29608	3.102768	5.215062	1.430325	1.664112	4.791253	3.861455	15.90754	64.02748

## Appendix B

**Table B.1: Vector Error Correction Model Results (FII Jordan)**

Equations	FII Equation		FR Equation		ER Equation		PR Coefficient	
	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.0443*	-1.7567*	-1.200	-0.3473	-.02780***	-4.930***	0.3120	0.70534
<b>FII</b>	0.040039	0.36733	1.79E-06	0.13125	-8.9306	-0.38359	-1.1105	-0.62787
<b>FR</b>	2.5.86	-0.48496	-0.09302	-1.43472	0.27359***	2.46715***	-0.0247	-0.29237
<b>ER</b>	3.40017	-0.78293	-0.02744	-0.50019	0.098013	1.04471	-0.01427	-0.19960
<b>PR</b>	5.61425*	-1.82121*	-0.00654	-0.07664	0.034994	0.23972	0.004179	0.03757
<b>OP</b>	0.610273	0.47096	1.6405	0.10164	-3.7305	-0.13477	-0.00022	-1.06471
<b>IS</b>	1.256741*	1.77646*	1.5105	0.07481	-6.7905	-0.19657	0.00032	1.21698
<b>INF</b>	-58.2734*	1.78124*	0.037569	0.57035	0.129374	1.14835	-0.04925	-0.57369
<b>INT</b>	-3.88808	-0.00168	0.285766	0.98826	0.508611	1.02839	0.209052	0.55475
<b>R-squared</b>	0.61760		0.51198		0.75772		0.464376	
<b>and Adj</b>	0.14658		0.0122		0.509601		-0.08416	

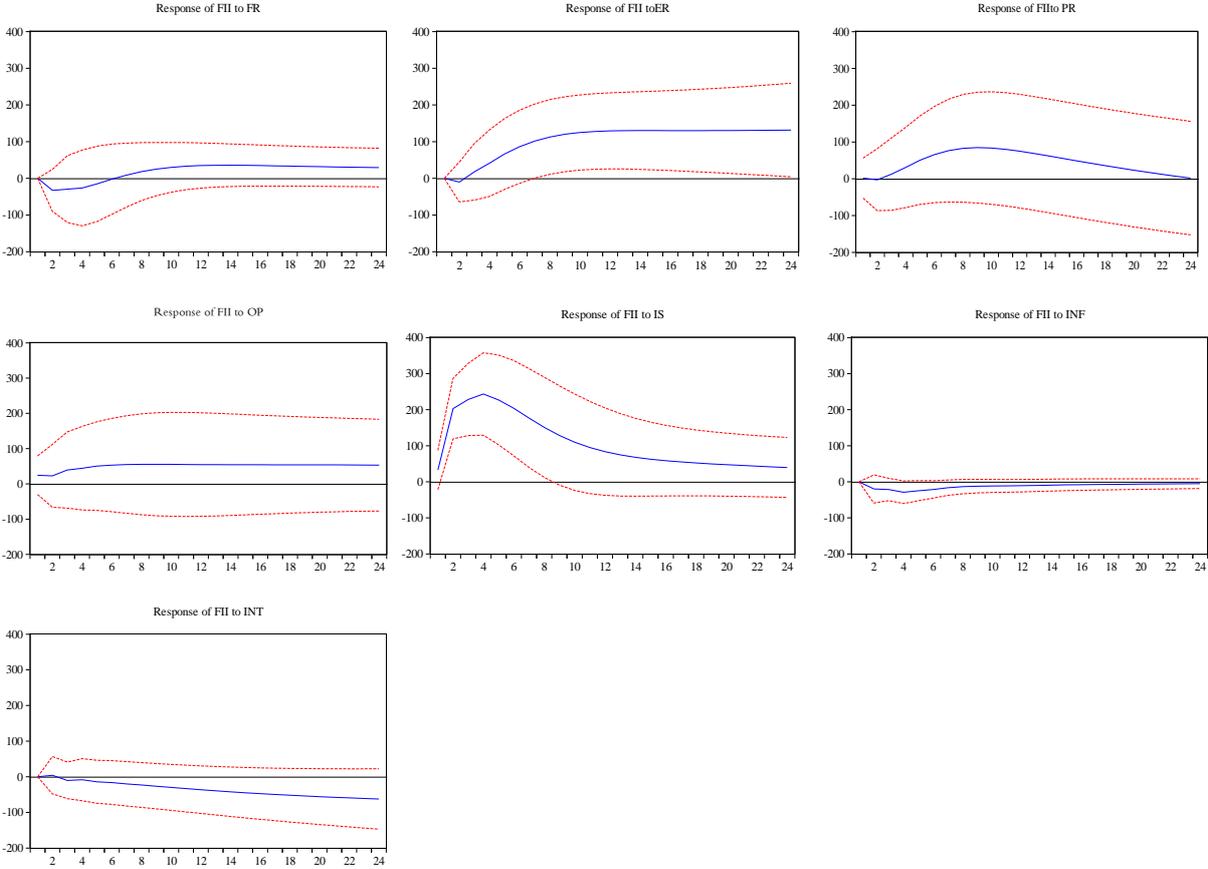
\*\*\*, \*\* and \* indicate statistical significant at 1%, 5% and 10% level respectively

**Table B.1 (continued): Vector Error Correction Model Results (FII Jordan)**

Equations	OP Equation		IS Equation		INF Equation		INT Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Variables	Coefficient	t-statistics	Coefficient
<b>ECT</b>	-0.002	-01.835	0.0053***	2.4109***	0.7760	1.3559	-0.1560*	-1.805*
<b>FII</b>	0.003232	0.31471	2.5405	0.00282	1.2905	0.56921	2.6506	0.56081
<b>FR</b>	-18.5728	-0.37955	27.92784	0.65062	-0.18144	-1.67639	-0.01251	-0.55526
<b>ER</b>	17.48711	0.42240	-46.5152	-1.28088	0.068052	0.74318	0.000631	0.03310
<b>PR</b>	-21.4103	-0.33238	-34.4516	-0.60971	-0.07039	-0.49403	-0.05277*	-1.77991*
<b>OP</b>	0.012626	0.10341	-0.032	-0.29879	0.00023	0.85287	9.8206	0.17480
<b>IS</b>	-0.04131	-0.27089	0.100462	0.75098	-0.00019	-0.55782	-6.6805	-0.95224
<b>INF</b>	14.407***	2.84445***	-47.8852	-1.09807	-0.17374	-1.58008	-0.02682	-1.17209
<b>INT</b>	-27.1732	-0.33284	23.41733	0.32699	0.772763***	4.27942***	-0.04679	-1.24533
<b>R-squared</b>	0.603487		0.662586		0.600397		0.64212	
<b>and Adj</b>	0.197418		0.317041		0.191165		0.275616	

\*\*\*, \*\* and \* indicate statistical significant at 1%, 5% and 10% level respectively

**Figure B.1: Inward FII in Jordan Response to Cholesky One S.D Innovations  $\pm 2$  S.E**



**Table B.2: The Results of Variance Decomposition Analysis of Inward FII in Jordan**

Explaining Movements in	Period	S.E	FII	FR	ER	PR	OP	IS	INF	INT
<b>FII</b>	<b>1</b>	4162.999	100							
	<b>10</b>	8697.248	87.18469	7.163136	4.596817	14.66775	1.667041	3.237366	7.415246	14.29914
	<b>15</b>	9931.314	81.037	6.310616	4.044528	19.0108	1.851227	4.646672	7.125123	13.95685
	<b>24</b>	10912.98	78.39459	6.273975	3.709229	18.87949	1.734291	9.138804	6.659567	13.43994
<b>FR</b>	<b>1</b>	0.517464	0.017329	99.98267						
	<b>10</b>	0.947254	2.151524	72.64557	6.311167	1.045388	0.25123	1.271919	3.172855	13.15035
	<b>15</b>	1.084251	2.076443	63.28728	12.89578	1.454945	0.224104	1.097564	5.169504	13.79439
	<b>24</b>	1.221484	2.54793	52.43731	20.71481	3.794102	0.305321	1.472623	4.806834	13.92107
<b>ER</b>	<b>1</b>	0.90219	0.43205	0.359743	99.20821					
	<b>10</b>	1.713819	0.77542	4.900208	48.32845	2.121656	1.458739	33.96459	7.658665	0.792274
	<b>15</b>	1.882876	0.819792	5.063797	42.74546	3.364668	1.836706	28.70279	16.57137	0.895418
	<b>24</b>	2.220583	1.28185	9.029052	34.35202	4.758788	3.729805	31.69302	14.0275	1.127965
<b>PR</b>	<b>1</b>	0.684734	2.760342	0.001044	1.069489	96.16912				
	<b>10</b>	1.406846	7.812586	1.833396	3.195224	82.25343	1.403081	1.647392	0.986145	0.868749
	<b>15</b>	1.597597	10.96361	1.689627	4.59833	76.04323	1.12396	2.549313	1.72112	1.310804
	<b>24</b>	1.778951	14.64091	1.523014	4.455515	69.48823	0.96077	3.398351	2.943074	2.590141

**Table B.2 (continued): The Results of Variance Decomposition Analysis of Inward FII in Jordan**

Explaining Movements in	Period	S.E	FII	FR	ER	PR	OP	IS	INF	INT
<b>OP</b>	<b>1</b>	399.4801	0.001547	0.038437	0.602131	0.455873	98.90201			
	<b>10</b>	410.7056	1.271283	0.720239	1.222791	0.631308	93.7498	0.927191	0.649497	0.827893
	<b>15</b>	416.987	1.330797	0.982339	1.239014	1.315127	91.39964	1.049889	1.120187	1.563012
	<b>24</b>	424.274	1.395877	1.199317	2.715174	1.897907	88.48557	1.404608	1.209684	1.691862
<b>IS</b>	<b>1</b>	349.5376	1.597616	0.97616	3.151159	0.307699	0.022451	93.94491		
	<b>10</b>	1055.3	5.016495	8.149935	0.730297	0.186012	1.449144	73.05024	10.48889	0.928985
	<b>15</b>	1251.321	4.540991	11.27354	0.541237	0.288721	3.13231	63.859	15.65627	0.707928
	<b>24</b>	1372.053	4.311569	12.36952	2.264825	0.675083	6.316948	58.4895	14.8057	0.76686
<b>INF</b>	<b>1</b>	0.883648	0.021506	0.06096	0.055262	0.000576	1.719515	7.40648	90.7357	
	<b>10</b>	2.129201	4.855621	8.116103	0.334264	0.510919	1.536567	27.5478	53.97406	3.124665
	<b>15</b>	2.757308	2.943469	9.727162	0.5545	0.467463	3.475882	32.29319	47.43337	3.104957
	<b>24</b>	3.464435	1.896542	9.061635	1.927437	0.343423	6.134732	29.35857	48.21403	3.063635
<b>INT</b>	<b>1</b>	0.189193	1.925591	0.105787	0.080001	0.745815	0.069555	0.254386	1.102431	95.71644
	<b>10</b>	0.280942	1.625108	2.696995	0.745213	1.363855	2.844863	3.013189	1.535798	86.17498
	<b>15</b>	0.338261	1.196578	2.977645	2.283419	1.979842	1.969466	2.42913	2.191713	84.97221
	<b>24</b>	0.395481	1.522594	3.720301	3.350107	1.963758	1.563329	2.863153	1.713526	83.30323

**Table B.3: Vector Error Correction Model Results (FII Australia)**

Equations	FII Equation		FR Equation		ER Equation		PR Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>ECT</b>	-0.61006*	-1.76539*	-0.98507*	-1.75063*	-0.10906	-1.05156	-0.16306*	-1.91193*
<b>FII</b>	0.075545	0.54108	-2.2006	-0.13803	6.2106	0.46665	1.8006	0.13711
<b>FR</b>	1655.347	1.64312	-0.1849	-1.60736	0.160687	1.67367	-0.12074*	-1.7540*
<b>ER</b>	2307.55*	1.75632*	-0.12967	-0.85942	0.159131	1.26367	0.075732	0.60992
<b>PR</b>	348.8675	0.33284	0.007675	0.06412	-0.10536	-1.05471	0.002832	0.02876
<b>OP</b>	228525.5*	1.78163*	46.8485***	2.42663***	-25.669*	-1.79308*	18.98946	1.19523
<b>IS</b>	22.9693	1.03193	0.00062	0.24384	0.002431	1.14603	-0.00041	-0.19634
<b>INF</b>	-252.508	-0.13269	0.36422	1.67616	-0.17143	-0.94526	-0.00081	-0.00455
<b>INT</b>	-8199.594*	-1.77657*	0.564506	1.07114	0.733895*	1.76852*	-0.51815	-1.19470
<b>R-squared</b>	0.574475		0.632296		0.602175		0.498632	
<b>and Adj</b>	0.03071		0.212735		0.148246		-0.07344	

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

**Table B.3 (continued): Vector Error Correction Model Results (FII Australia)**

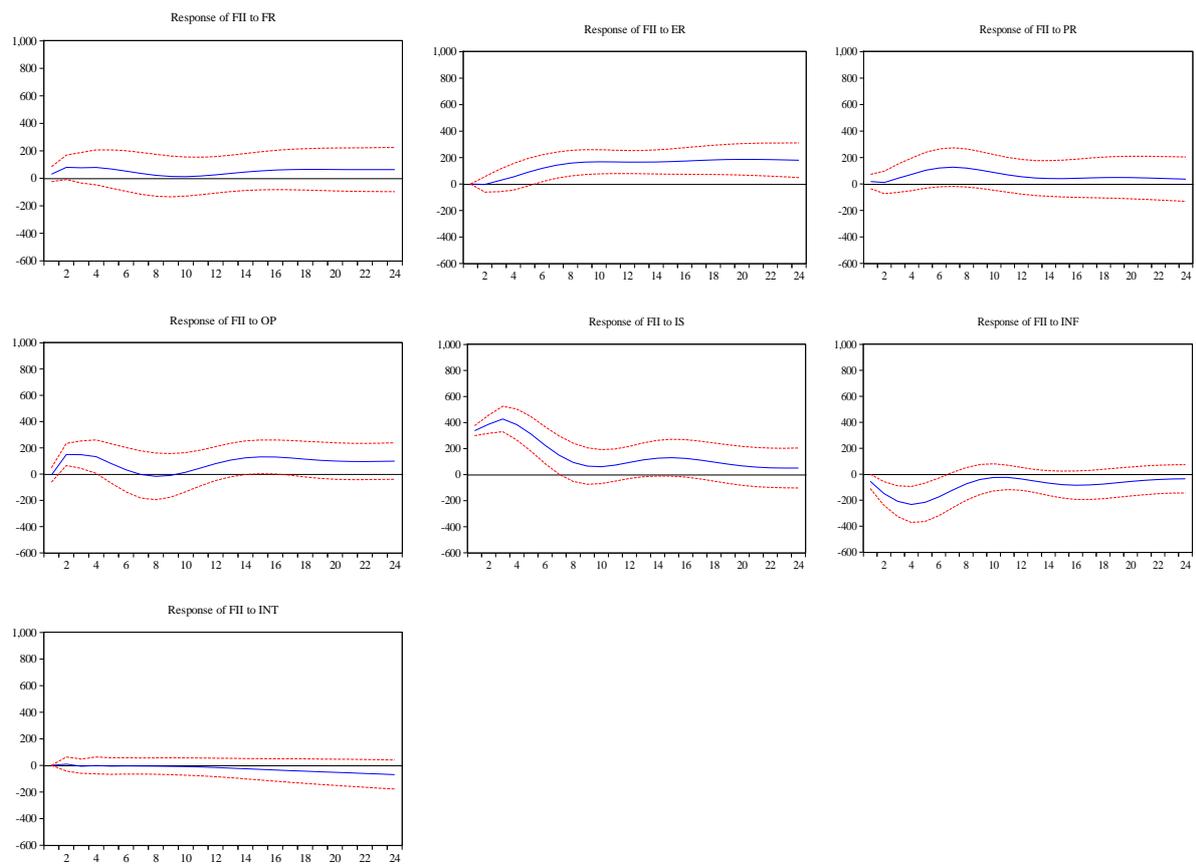
Equations	OP Equation		IS Equation		INF Equation		INT Coefficient	
Variables	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics	Coefficient	t-statistics
<b>FII</b>	-0.3408***	-7.2719***	-0.89805*	-1.8072*	0.76007*	1.75278*	-0.59508	-0.24727
<b>FR</b>	-3.3405	-0.04958	-3.17098	-0.61818	-3.3405	-0.04958	-3.17098	-0.61818
<b>ER</b>	-0.00138	-1.68499	10.1708	1.63734	-0.00138	-1.68499	10.1708	1.63734
<b>PR</b>	0.000379	0.55693	0.103467	0.01996	0.000379	0.55693	0.103467	0.01996
<b>OP</b>	-0.16234	-1.61085	972.3891	1.26727	-0.16234	-1.61085	972.3891	1.26727
<b>IS</b>	1.2205	0.86695	-0.0524	-0.48882	1.2205	0.86695	-0.0524	-0.48882
<b>INF</b>	-0.00109	-0.87845	10.13333	1.06934	-0.00109	-0.87845	10.13333	1.06934
<b>INT</b>	0.002214	0.72334	-7.31118	-0.31374	0.002214	0.72334	-7.31118	-0.31374
<b>R-squared</b>	0.80392		0.555061		0.467053		0.55262	
<b>and Adj</b>	0.58019		0.047374		-0.14105		0.042147	

\*\*\*indicate statistical significant at 1% level

\*\*indicate statistical significant at 5% level

\*indicate statistical significant at 10% level

**Figure B.2: Inward FII in Australia Response to Cholesky One S.D Innovations  $\pm 2$  S.E**



**Table B.4: The Results of Variance Decomposition Analysis of Inward FII in Australia**

Explaining Movements in	Period	S.E	FII	FR	ER	PR	OP	IS	INF	INT
<b>FII</b>	<b>1</b>	8716.657	100							
	<b>10</b>	9861.716	92.3654	1.511795	0.20405	0.243424	0.999828	3.097809	0.436178	1.141514
	<b>15</b>	10614.91	77.91393	2.297702	0.79704	2.404964	2.114691	5.579945	5.406188	4.485545
	<b>24</b>	11002.93	70.11019	4.974872	5.171774	7.741307	6.733784	6.825188	10.557413	8.885468
<b>FR</b>	<b>1</b>	0.989843	1.223726	98.77627						
	<b>10</b>	1.210781	10.78264	68.27361	4.934462	4.516606	2.09824	0.848144	3.04072	5.505582
	<b>15</b>	1.287315	9.879555	53.93605	7.002763	4.604886	2.857879	7.192999	5.919041	8.606826
	<b>24</b>	1.393077	11.26918	47.89077	9.2535	5.442561	4.318681	6.915587	7.07517	7.834552
<b>ER</b>	<b>1</b>	0.866679	0.554396	13.32946	86.11614					
	<b>10</b>	1.026007	6.063112	15.07077	62.76912	3.78964	1.320885	5.328777	0.957178	4.700526
	<b>15</b>	1.081214	9.270306	12.80874	53.15967	8.527979	1.584434	6.657201	2.686654	5.30502
	<b>24</b>	1.130864	9.095682	11.79213	48.59257	7.928289	3.539426	8.508033	4.982535	5.561338
<b>PR</b>	<b>1</b>	0.834039	0.091301	0.327121	0.26366	99.31792				
	<b>10</b>	0.94867	0.487999	4.165111	5.711242	77.66694	3.223774	6.413457	1.406894	0.924587
	<b>15</b>	0.98233	1.150881	5.458199	8.038966	68.00326	3.834056	8.22968	3.662713	1.622243
	<b>24</b>	1.031935	1.702004	6.901222	8.87941	63.57806	4.845878	8.461975	3.74114	1.890315

**Table B.4 (continued): The Results of Variance Decomposition Analysis of Inward FII in Australia**

Explaining Movements in	Period	S.E	FII	FR	ER	PR	OP	IS	INF	INT
<b>OP</b>	<b>1</b>	0.005862	10.35084	2.350536	0.101453	0.085493	87.11168			
	<b>10</b>	0.00729	8.023152	8.355955	5.553886	0.573722	75.66225	0.671761	0.82432	0.334952
	<b>15</b>	0.007572	10.11768	10.60343	4.972825	1.707397	64.83657	3.424712	2.513181	1.82421
	<b>24</b>	0.007998	10.93247	9.41449	5.064667	2.122553	62.27715	4.53022	3.146215	2.512237
<b>IS</b>	<b>1</b>	45.8259	0.021712	5.201249	1.547342	0.046373	5.846108	87.33722		
	<b>10</b>	54.40067	6.803811	5.638619	3.721426	7.155092	7.280646	66.07725	2.241311	1.081842
	<b>15</b>	57.20704	10.35932	6.525453	4.264017	8.150847	6.246823	54.96588	3.133876	6.35378
	<b>24</b>	61.0765	11.38527	6.597287	5.164414	8.812011	5.904503	50.55735	3.802862	7.776301
<b>INF</b>	<b>1</b>	0.501808	1.10487	3.44961	1.981696	0.791801	0.819751	0.146531	91.70574	
	<b>10</b>	0.540058	3.055192	6.116739	2.257651	2.781046	1.414115	0.807844	80.39094	3.176468
	<b>15</b>	0.577864	5.153644	7.224465	4.498608	5.842496	1.830987	1.662759	68.09801	5.689031
	<b>24</b>	0.593233	5.206939	6.932032	5.87705	5.825116	3.13821	2.714973	64.70138	5.604301
<b>INT</b>	<b>1</b>	0.233894	5.320487	0.022646	0.257523	1.23712	0.002494	0.171864	2.332089	90.65578
	<b>10</b>	0.27632	15.41356	2.380459	0.421701	0.942392	0.602483	2.201828	11.26711	66.77046
	<b>15</b>	0.290188	17.98026	2.647278	1.143685	2.28307	1.277759	2.57777	12.83153	59.25865
	<b>24</b>	0.298471	16.13412	3.064102	1.368737	3.581364	3.177509	4.491646	13.78211	54.40041

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