

*Centre for Research in Applied Economics
(CRAE)*

Working Paper Series
2007-05
July

*“The Effects of Extreme Political Acts and Political Risk
on International Banking Systems”*

By John Simpson

Centre for Research in Applied Economics,
School of Economics and Finance
Curtin Business School
Curtin University of Technology
GPO Box U1987, Perth WA 6845 AUSTRALIA
Email: michelle.twigger@cbs.curtin.edu.au
Web: <http://www.cbs.curtin.edu.au/crae>

ISSN 1834-9536

**THE EFFECTS OF EXTREME POLITICAL ACTS AND POLITICAL RISK ON
INTERNATIONAL BANKING SYSTEMS**

By

**John L Simpson
Academic Staff, School of Economics and Finance
Curtin University
Hayman Road, Bentley, GPO Box U1987, Perth, Western Australia
08 92664417 work phone
E mail: simpsonj@cbs.curtin.edu.au**

ABSTRACT

This study supports existing evidence of adverse domestic and international economic and financial spillover effects of extreme political acts. The relationship between the variables in the model is greater after the 9/11 event than before; the effects are greater in developed compared to developing banking systems; and the adverse effects had not dissipated in period of relative stability up to late 2004. In addition, USA political risk-adjusted banking returns together with world-banking system returns add new information in explaining country-banking system political risk-adjusted returns. This evidence should be heeded by risk managers and bank regulators in calculations of capital adequacy benchmarks to mitigate systemic flow-on effects.

Key Words: 9/11, political risk, banking returns, world-banking, USA-banking, country-banking

JEL: F36

Introduction

The motivation for this study stems from several facts as follows: The most significant and tragic extreme political act in USA history was the terrorist attack on the World Trade Centre in New York on the 11th September 2001. This sad event also had an effect on financial and other markets within the USA. Historical economic and financial data do not fully explain stock prices and returns. Expert political risk opinions and events may explain more. International banks are key economic agents and banking system stock returns are important partial indicators of economic activity. The USA is the most powerful of open market economies with the most internationalised banking system.

This paper tests the domestic and international effect of political risk and extreme political acts in the USA on the USA banking system. The international effect is tested on other developed systems (for example, in Australia and the UK) and to key South East Asian systems (for example in Thailand, Malaysia and the Philippines) where there is significant trade and investment with the USA including banking linkages.

The central issues addressed in this paper are as follows: How important was the effect of “9/11” on the USA-banking system? How important were spillover effects on other banking systems? Did these effects intensify after the attacks or did they dissipate in a period of relative stability to late 2004? Do pure political risk-adjusted banking returns variables add new information to international banking markets for the use of risk managers and bank regulators?

The paper is organised as follows: Relevant literature is discussed along with the concept of pure political risk. The data, model, methodology and preliminary analysis are then

discussed. Finally, findings are reported and a conclusion and policy implications are noted.

Theory and literature

Authors such as, Blomberg et al (2004) and Anderton and Carter (2004) examined macro and microeconomic effects respectively, in relation to terrorism. Blomberg et al used regression and vector autoregressive (VAR) techniques to find that, on average, the incidence of terrorism may have a significant negative effect on growth. However, the effect is smaller and less persistent than that related to external wars or internal conflict. They also find that terrorism involves the redirection of economic activity from investment to government spending and that there are differences in the incidence of and economic consequences of terrorism in different groups of countries. Terrorist incidences are more frequent in developing countries. However, negative influences of those activities on growth are smaller in developed countries. Anderton and Carter use utility maximisation and game theory models to demonstrate terrorist resource allocation choice effects and government counter-terrorism efforts and also the strategic interdependencies among terrorists and governments.

Krug and Reinmoeller (2003) find through microeconomic analysis that the process of globalisation changes the supply of terrorist attacks and the costs of tolerating terrorist hazard. Adjustments in the gains of globalisation need to be made with the added terrorist risk. Bram (2003) finds that the “9/11” attacks created sizeable job and income losses in New York, but that New York’s downturn, post “9/11”, stems largely from other factors, such as the state of the national economy and the financial markets.

Other studies examine the impact of terrorism on specific industries. Blair (2002) investigated the economics of post “9/11” aid to airlines in the USA. Specifically Blair considered the merits of the Air Transportation Safety and System Stabilisation Acts passed by congress immediately after “9/11”. Blair finds that the lack of profitability of the industry was due to structural problems within the industry as well as fear of further attacks. The overall weakness in the USA economy was also a factor. The symbolic role of government in providing a promise of financial support to the airline industry thrust the US government into a questionable role of setting industrial policy at a micro-level.

Ito and Lee (2003) assessed the effects of “9/11” on US airline demand. They find a negative transitory shock as well as a negative demand shock. The latter had yet to dissipate and could not be explained by economic, seasonal or other factors. Liu et al (2003) examined and compared the reaction of financial markets to the real estate market post “9/11”. They find that the subsequent week of share market closure gave market participants time to reconcile the complex impact of “9/11” on market prices. After “9/11” New York properties under-performed significantly compared to other US properties of a similar type.

De Mey (2003) finds both direct and indirect adverse effects on the insurance industry post “9/11” due to the substantial direct and indirect economic losses suffered by the City of New York. Brown et al (2004) examined the role of the US government in the market for terrorism reinsurance and investigated the negative stock market responses of affected industries prior to the enactment of the Terrorism Risk Insurance Act of 2002. Poteshman (2003) finds, in an investigation of options market activity in the US in the days leading

up to “9/11” that call option volume ratios and call volume indicators were at typical levels but that put option volume indicators seemed unusually high.

Maillet and Michel (2005) investigated the impact of “9/11” on USA and French share markets. Using a methodology having a measure relying on an analogy with geophysics they find that the crisis triggered by “9/11” in the share markets was the worst since 1987 and the ninth worst compared to major historical crises Hon et al (2005) modelled conditional heteroskedasticity to find that international stock markets, particularly those in Europe, responded closely to USA stock market shocks in the three to six months after the crisis of “9/11” than before. Their evidence suggests that the benefits of international diversification in times of crisis are significantly lessened.

International spillover effects of crises in USA stock markets and currency markets have been previously examined (For example, King & Wadhvani, 1990; Hamao et al, 1990; Susmel & Engle, 1994; Kaminsky & Reinhart, 2000). A comprehensive literature on financial market crisis and contagion is covered in De Bandt and Hartman (2000).

Straetmans et al (2003), in their main objections to spillover literature, say that correlation measures are non-robust to changing the underlying distribution assumptions of the return processes. They used extreme value analysis to assess whether or not downside risk measures such as value at risk and external sector linkages were significantly altered after “9/11”. Their evidence indicates that the potential for domestic portfolio diversification during crisis periods decreased. In addition they find little support for a structural change in downside risk before and after “9/11”.

Whilst the methodology of extreme value analysis is compelling, the study in this paper is unique, as it seeks to bring political risk factors into basic international banking market

models¹. The developing and developed countries selected for this study of their banking systems possess robust trade and investment relationships with the USA. The developing country samples have demonstrated susceptibility to past currency crises and spillover effects (For example, the South East Asian currency crisis of mid 1997).

Country/sovereign risk ratings compared to political risk ratings

Country/sovereign credit rating history is published by world credit risk rating agencies, such as Standard and Poor's, Moody's and Fitch-IBCA. The ratings scales and assessments are comparable. The scales extend from extremely strong ability to repay through to default. The agencies also report credit watches (short-term potential direction) and ratings outlooks (long-term potential directions). According to various authors (For example, Simpson, 2002) the manifestation of country risk is the inability or unwillingness of a country to service external debt. This implies that country risk, when considered as a total risk concept, has an economic/financial component (that is, a systematic component based on historical balance of payment data) and a human component (that is, an unsystematic or country specific component based on opinions on political outcomes that are also influenced by social and cultural factors).

The economic and financial component is objectively assessed as it is based on fact. It is not avoidable as it is the same for all. The unsystematic component is largely subjectively assessed and thus difficult to measure. However, this component of total country risk is avoidable through diversification. Political risk is the slowing down in the meeting of external commitments due to political factors such as riots, strikes and civil unrest. This is related to other factors such as, the degree of corruption in government, the history of

¹ The basic international banking market models in this paper have been derived from the work in the area of portfolio theory by Markowitz (1959) and from the work in Capital Asset Pricing Models by Sharpe (1964), Roll (1977) and Ross (1976).

law and order, the quality of the bureaucracy etc. These factors have much to do with the social customs and cultural history of most countries.

Simpson (2002) examined a cross sectional sample of 1995 country and international banking risk ratings and economic and financial data and finds the following: First, the risk ratings from the leading ratings agencies are highly positively correlated. Second, country risk ratings may be largely replicated using primarily trade performance and debt serviceability data. Third, country risk ratings are also highly positively correlated with international banking risk ratings, thus reflecting the importance of banks as key economic agents. Fourth, pure political risk factors have a very small role in the ratings replication process. Finally, from a cross sectional analysis of risk ratings alone it is not possible to tell whether or not the ratings leads or lag either financial or economic crises.

In light of the problems within cross sectional studies, it is proposed in this study that pure political risk time series data be combined with country-banking returns data. Pure political risk scores are available through the International Country Risk Guide (ICRG). The basis of this scoring system is described in the section describing political risk scores. There is a conceptual distinction to be made between country/sovereign risk and pure political risk.

The Literature on stock market returns and country risk

Most authors have not properly differentiated between country/sovereign risk and pure political risk. They have analysed country/sovereign risk ratings (which have stronger economic and financial components) rather than pure political risk (which incorporate subjectively quantified opinions on political outcomes). Despite this flaw, the questions asked over recent years by researchers, banking regulators and investors relate to the

importance of the impact of country/sovereign risk factors on stock market returns in both developed and emerging markets. Another question is whether or not risk ratings lead or lag financial or other crises. In other words, do the risk scores add new information to stock markets?

Studies such as, Holthausen and Leftwich (1986), Hand, Holthausen and Leftwich (1992), Maltosky and Lianto (1995) argued that rating downgrades are informative to equity markets, but find that upgrades do not supply markets with new information. Cantor and Packer (1996) examined a sample of developed and emerging markets over the period 1987 to 1994 and find that risk ratings have a significant impact on bond yield spreads. Erb et al (1996) discussed the importance of an understanding of country risk for investors. They find that country risk measures are correlated with future equity returns but, financial risk measures reflect greater information. They also find that country risk measures are also highly correlated with country equity valuation measures and that country equity value oriented strategies generate higher returns.

Diamonte et al (1996) used analyst's estimates of country risk. They find that country risk represents a more important determinant of stock returns in emerging rather than in developed markets. They also find that over the past 10 years country risk had decreased in emerging markets and increased in developed markets. They speculate that if that trend continues, the differential impacts of country risks in each of those markets will narrow.

Hill (1998) finds that in times of crisis many investors may be determined to minimise exposure to politically risky securities until they have more information. However, after a period of calm the spreads being offered appear to be too high relative to the risks. After more investors return to the market the spreads get less and when there is another crisis

the cycle recommences. Specifically in regard to the Asian currency crisis, Radelet and Sachs (1998) suggested that ratings agencies are too slow to react and when they did react their ratings intensified and prolonged the crisis.

Ferri et al (1999) argued that the agencies behave in a procyclical manner by upgrading risk ratings during boom times and downgrading them during crises. Reisen and von Maltzan (1999) argued that risk ratings agencies exacerbate boom-bust cycles in financial markets and put emerging markets at greater risk. Hooper and Heaney (2001) studied regionalism, political risk and capital market segmentation in international asset pricing. They conclude that multi index models should incorporate a regional index, an economic development attribute, commodity factors and a political risk variable in order to more effectively price securities.

Brooks et al (2004) argued that equity market reactions to ratings changes reveal significant responses following downgrades. Hooper, Hume and Kim (2004) find that risk ratings agencies provide stock markets and foreign exchange markets in the United States with new tradable information, where ratings upgrade increase stock markets returns and decrease volatility significantly. They also discover significant asymmetric effects of ratings announcements where the market responses are greater in the case of ratings downgrades.

Busse and Hefeker (2005) explored the connection between political risk, institutions and foreign direct investment flows (some of which is channeled into stock markets). They find that government stability, the absence of internal conflicts and ethnic tensions, basic democratic rights and the ensuring of law and order are highly significant determinants of foreign investment flows.

The evidence overall supports a “9/11 spillover effect” in economies, industries, and share markets. The evidence is mixed but, mostly points to country/sovereign risk having a significant relationship with stock market returns. Some of the above arguments imply that financial crises, as reflected in reduced stock market returns, are the drivers of sovereign risk ratings. If this is the case, risk ratings agencies do not contribute new information to financial and banking markets.

What is pure political risk?

Economic and financial risk has nothing overtly to do with pure political risk, although it is arguable that under the surface, the unwillingness to service external debt may be influenced by acute shortages of foreign exchange (Bourke & Shanmugam, 1990). Pure political risk according to ICRG relates to political stability as evidenced by expert opinions collected, collated and categorised on areas as follows: Government stability, socio economic conditions, investment profile, internal conflict, external conflict (where the ratings ascribed are out of 12), corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability (where the ratings are out of 6), and the quality of bureaucracy (where the ratings are out of 4). According to ICRG, in each category, the numerically higher the score or rating the lower the risk. The descriptions of the various components of pure political risk are included in Appendix 4.

The data

Daily banking stock market price index data for the world-banking system, the USA-banking system and sampled country-banking systems are converted to returns series. The USA and the country-banking returns data are combined with political risk scores. The returns data are extracted from Datastream for the period 31st December 1999 to 17th

September 2004. Political risk ratings are collected from the ICRG database over the same period.

For the purposes of this paper, the composite political risk scores (combining all of the pure political risk components and subcomponents as referred to in Appendix 4) ascribed by ICRG out of 100 for each country, are reversed to reflect that low numerical risk scores equate to low levels of risk and high numerical risk scores equate to high levels of risk. That is, composite political risk ratings out of 100 are extracted for each country in the sample and deducted from 100.

The resultant numbers are then multiplied by daily banking stock market index returns to arrive a country-political risk value associated with that country's banking returns. Low values of the country-banking system variable are associated with lower political risk for a given level of return. The data are analysed using the EViews (2001) statistical package. Note that during the analysis and findings reference occasionally is made to country-banking systems/variables, a world banking system/variable and the USA-banking system/variable. These variables, except for the world banking system variable, are country-banking system returns that are political risk-adjusted. The world banking system/variable is a world banking stock index returns variable.

The Model and Methodology

The first step is the specification of a basic systemic international banking market model of unlagged country-banking variables² regressed against the world-banking stock price index returns and the USA-banking variable.

² Banking System Returns = $R_t = \frac{(P_t - P_{t-1})}{P_{t-1}}$. Where P represents the banking share price index values at times t and t-1.

$$PolR_{i_t} = \alpha_{i_t} + \beta_{i_t} (R_{w_t}) + \gamma_{i_t} (PolR_{USA_t}) + e_{i_t} \quad 1)$$

Where;

$PolR_{i_t}$ is political risk adjusted banking returns in country-banking system i at time t

R_{w_t} is the return on world-banking system's price index i at time t .

α_{i_t} is the regression intercept and β_{i_t} and γ_{i_t} are the regression coefficients.

$PolR_{USA_t}$ is political risk adjusted banking returns in the USA banking system.

e_{i_t} is the error term of the regression.

A negative relationship between the US banking variable and the other country-banking variables means that higher political risk in the US banking system is associated with lower political risk in a country-banking system for a given level of return. A positive relationship between the world-banking returns variable and the country-banking system variables means that lower world-banking returns are associated with lower country-political risk for a given level of country-banking returns. This would be consistent with the finance theory in the risk/return tradeoff and would make comment about relative riskiness in a country-banking system after an extreme political act.

Based on Granger (1988) findings that financial and economic time series may contain unit roots and on the development of the theory of non-stationary time series analysis, the unlagged regression models are re-specified into a model to implement VAR based tests of cointegration and causality. The international banking market VAR model involves lagged data in world-banking returns and country-political risk-adjusted returns from Equation 1.

$$PolR_{i_t} = a(PolR_{i_{t-1}}) + \dots + a_n(PolR_{i_{t-n}}) + b(R_{w_t}) + c(PolR_{USA_t}) + e_{1i_t} \quad 2)$$

By implication, all variables in the multivariate model described in Equation 2 are optimally lagged. Equations 1 and 2 are tested over the full period of the study and in a “before and after window” on the “9/11” event.

Preliminary analysis

Prior to testing the models, analysis is undertaken to demonstrate the basic facts and assumptions relating to the global influence of the USA-banking system. In this part of the analysis only prices rather than risk-adjusted returns are examined. The level series of prices are found to be non-stationary and the errors of associated regressions reveal serial correlation and heteroskedasticity according to Augmented Dickey Fuller (ADF) unit root tests (Dickey & Fuller, 1981), Durbin Watson (DW) tests (Durbin & Watson, 1971) and White tests. In the presence of serial correlation, the level series regressions are regarded as spurious.

The preliminary analysis moves to first differences. Each banking system in first differenced price index values is regressed on the world-banking system in first differenced price index values. All data are found to be stationary processes. The errors of the regressions are found to be stationary. The errors of the regressions are not serially correlated according to DW tests. However, heteroskedasticity is found to be persistent according to White tests. On that basis weighted least squares replace ordinary least squares (OLS)³ regression analysis.

Table 1 shows the results of the preliminary analysis. The ranking of global influence in banking is shown in Column 2. The USA model has the greatest explanatory power. The results demonstrate that, in an overall comparison of the selected country-banking systems, the developed country system regressions (particularly those for the USA and

³ Deemed more suitable in the presence of heteroskedasticity of an unknown form.

the UK) have higher adjusted R square values, higher regression coefficients, higher t statistics and lower standard errors than the developing country systems. The analysis of prices is a useful initial indicator of the importance of the USA-banking system in a global context.

Table 1

Regression analysis of country-banking systems interacting with the world-banking system in first differenced prices

Country and regional banking price index First differences regressed on the world-banking price index first differences: (1)	Rank (Adjusted R Square value and t statistic value) (2)	Regression adjusted R Square value (3)	Regression coefficient (Beta) (4)	t statistic for regression coefficient (5)
USA	1	0.6340	1.4740	46.1639
UK	2	0.4546	7.3415	32.0174
Australia	3	0.0354	0.2116	6.7778
Thailand	4	0.0235	0.0617	5.4680
Malaysia	5	0.0061	0.0926	2.8017 **
Philippines	6	0.0014	0.0248	2.0180 **

Note: All t statistics are significant at the 1% level except those marked ** where significance is at the 5% level. The ranking is according to explanatory power in the adjusted R square and the t statistic values.

Main findings

The first step following preliminary investigation is to undertake regression analysis of unlagged data testing the specified models that incorporate political risk ratings. Weighted least squares regression analysis (See Equation 1) of unlagged data is examined initially for the full period of the study by regressing each country-banking system variable on the world-banking system and the USA-banking system variables.

Regression analysis of unlagged data

Full period

Table 2 shows the results of the analysis, testing the full period of the study from 31st December 1999 to 17th September 2004.

Table 2

Regression results over the full period of the study

Country-banking System Regression	Adjusted R Square Value	Coefficient for World-banking System (t statistic)	Coefficient for USA-banking System (t statistic)
UK	0.5503	0.1996 (33.6282)	-0.3349 (-14.9014)
Australia	0.0708	0.0463 (9.7457)	-0.1278 (-7.1068)
Thailand	0.0571	0.2476 (8.6479)	-0.6890 (-6.3543)
The Philippines	0.0045	0.0572 (2.6936)	-0.1666 (-2.0735)
Malaysia	0.0205	0.0883 (5.0836)	-0.3094 (-4.7028)

Note: All values are significant at the 5% level. The country-banking system is the dependent variable.

These results demonstrate that there are statistically significant interrelationships between each country-banking system, the world-banking system and the USA-banking system over the full period of the study. The sizes of the adjusted R square values, coefficients and t statistics indicate that the developed country-banking system regressions of the UK and Australia exhibit greater explanatory power than the developing country-banking systems. The signs of the coefficients and t statistics show that there is a positive relationship between country-banking system variables and the world-banking system returns variable. That is, higher levels of world-banking returns are associated with higher levels of country-political risk-adjusted banking returns. This is consistent with theory in the risk return tradeoff and confirms greater financial integration of the developed country-banking systems with the USA system.

A negative relationship exists with the country-banking system variable and the USA-banking system variable. That is, higher levels of political risk-adjusted banking returns in the USA-banking system are associated with lower levels of political risk-adjusted banking returns in the country-banking systems. The stronger interaction is also with the

developed banking systems of the UK and Australia. As political risk in the USA-banking system increases, it is evident that perceived political risk in other sampled country-banking systems in the UK, Australia and in South East Asia reduces for a given level of banking returns. The study is then expanded to the before and after window of “9/11” to demonstrate the spillover effect.

Structural breaks tests for “9/11”

Each regression is tested at the 5% level of significance using Chow forecast and breakpoint tests including “9/11” as the date for testing. The values of the F statistics and log likelihood ratios and their significance provide confirmation of structural breaks in the data for each country-banking system regression except for that of the Philippines.

Periods before and after “9/11”

Table 3 shows the results of the regression analysis before and after the “9/11” attacks and compares the results to those from Table 2. The interest lies in the periods before the terrorist attacks from 31st December 1999 to 10th September 2001 and after the terrorist attacks from the 12th September 2001 to 17th September 2004. In each case, for both developed and developing country-banking systems, the explanatory power of the regressions is greater in the period after “9/11”. This again is indicated in the values of the adjusted R square values, coefficients and t statistics. Note that the results for the Philippines and the Malaysian banking systems interacting with the world-banking system and the USA-banking system are not significant in the period before “9/11” but, are significant in the period after “9/11”. The interaction of the developed country-banking systems of the UK and Australia is greater than that for the developing country-

banking systems in the periods before and after “9/11” and during the full period of the study.

Table 3

Regressions of country-political risk in country-banking industry returns

Regression Statistic	31/12/1999 to 17/09/2004 (Full period of Sample)	31/12/1999 to 10/09/2001 (Before “9/11”)	12/09/2001 to 17/09/2004 (After “9/11”)
UK			
Adjusted R Square	0.5503	0.5073	0.5818
World Returns Coefficient	0.1996	0.1803	0.2149
World Returns t Statistic	33.6282	18.9608	28.3656
USA-political Risk in Returns Coefficient	-0.3349	-0.4904	-0.3315
USA-political Risk in Returns t Statistic	-14.9014	-9.5403	-12.4844
AUSTRALIA			
Adjusted R Square	0.0708	0.0648	0.0898
World Returns Coefficient	0.0463	0.0527	0.0474
World Returns t Statistic	9.7457	5.6534	8.6471
USA-political Risk in Returns Coefficient	-0.1278	-0.2175	-0.1097
USA-political Risk t Statistic	-7.1068	-5.1711	-5.7083
THAILAND			
Adjusted R Square	0.0571	0.0470	0.0740
World Returns Coefficient	0.2476	0.2974	0.2543
World Returns t Statistic	8.6479	4.8330	7.8511
USA-political Risk in Returns Coefficient	-0.6890	-1.0942	-0.6149
USA-political Risk in Returns t Statistic	-6.3543	-4.1930	-5.4167
PHILIPPINES			
Adjusted R Square	0.0045	0.0042*	0.0144
World Returns Coefficient	0.0572	0.0154*	0.0813
World Returns t Statistic	2.6936	0.3432*	3.5266
USA-political Risk in Returns Coefficient	-0.1666	0.0029*	-0.2398
USA-political Risk in Returns t Statistic	-2.0735	0.0146*	-2.9701
MALAYSIA			
Adjusted R Square	0.0205	0.0065	0.0538
World Returns Coefficient	0.0883	0.4740*	0.2111
World Returns t Statistic	5.0836	1.2270*	6.8951
USA-political Risk in Returns Coefficient	-0.3094	-0.3359	-0.3451
USA-political Risk in Returns t Statistic	-4.7028	-1.9266	-5.6059

Note: All values are significant at the 5% level. * Denotes not significant.

It is evident that the “9/11” attacks induced structural changes in banking returns and political risk data, because after “9/11” the interrelationships in political risk and banking returns between country, world and USA banking systems are stronger. Spillover effects are also demonstrated. After the attacks there is a stronger positive relationship between

world-banking returns and the country-banking system variables. This effect remains stronger in the developed country-banking systems of the UK and Australia. After “9/11”, there is a stronger negative relationship between USA-political risk associated with USA-banking returns and political risks associated with country-banking returns.

VAR: Causality Analysis of Lagged Data

Equation 2 is analysed in VAR based Johansen cointegration and Granger causality tests to confirm exogeneity and to verify the regression specification in Equation 1. The VAR stability condition checks in each case shows that no roots lie outside the unit circles and that each of the VARs satisfy the stability condition check. Lag order selection is undertaken by examination of the maximum value of Schwartz information criteria⁴. Unit root tests (ADF and PP) show that the study is dealing with integrated non-stationary processes. Evidence of a long-term cointegrating relationship is found in each country-banking model. However, the more important objective of this study is to examine exogeneity. Tests indicate an optimal lag order of 1-2. Using this VAR lag order, VAR based pairwise Granger causality/block exogeneity Wald tests are undertaken over the full period of the study, and then for the periods before and after “9/11”, to confirm exogeneity. Significance levels were set at 5% for the sizes of the respective Chi Square values (See Appendices 1 to 3).

Full period

Granger causality results are summarised in Appendix 1. It is noted that, in each country-banking system VAR, the USA-banking system Granger causes the world-banking returns system. In addition, the world-banking system does not significantly Granger

⁴ Patterson (2000) suggests that Swartz information criteria may be used in preference to other criteria such as Akaike to simultaneously estimate lag order and cointegrating rank. Alternatively an information criterion such as Akaike or Swartz can be used to determine the lag order and then the Johansen procedure (Johansen, 1988) can be used to estimate the cointegrating rank. This paper uses both the Swartz criterion and the Johansen test to estimate lag order and cointegrating rank.

cause the country-banking systems except in the cases of those for Thailand (at the 5% significance level) and the Philippines (at the 1% significance level). In the case of the UK banking system VAR, the USA-banking system is exogenous (significant at the 1% level). In the case of the Australian banking system VAR, the USA-banking system is exogenous (at a significance level of 1%). In the cases of the Thai and Philippines banking system VARs there is no significant evidence of exogeneity of the USA-banking system. In the case of the Malaysian banking system VAR, the USA-banking system is exogenous, but the evidence is not highly significant at the 10% level.

Period before “9/11”

Granger causality results are summarised for the period before “9/11” in Appendix 2. Over the period from 31st December 1999 to 10th September 2001, the USA-banking variable is exogenous in the UK, the Australian and the Philippines banking systems (in the latter two cases the significance level is less, at 5%). There is no significant Granger causality running from the USA-banking system to the Thai or Malaysian systems. The USA-banking system and the world-banking system are exogenous when considered together interacting with each country-banking system (at significance levels of 1%). In each country-banking system VAR, the USA-banking system Granger causes the world-banking system at a significance level of 1%. In the cases of the Philippines and the Malaysian banking systems Granger causality lies with the world-banking system at significance levels of 1% and 10% respectively.

Period after “9/11”

Appendix 3 summarises the results of Granger causality tests for the period after “9/11”. In each country-banking system VAR, Granger causality runs from the USA-banking

system to the world-banking system (at significance levels of 1%). In addition, the USA-banking system is exogenous (significant at the 1% level), when considered separately to the world-banking system, in each country-banking system except that of the Philippines. In the case of the Thai banking system, the significance level of the exogeneity of the USA-banking system is less, at 5%. In the cases of the Philippines and Malaysian VARs, the world-banking system is exogenous with significance at the 1% level. In each country-banking system VAR, exogeneity lies with the world-banking system and the USA-banking system when these variables were considered together (with significance levels at 1% in each case). These relationships are stronger than before “9/11”.

Conclusion

The “9/11” terrorist attacks were tragic examples of extreme political acts. The evidence of studies finding adverse macro-economic and micro-economic, industrial and spillover effects are generally supported in this paper. For example, macro and micro-economic effects (Blomberg et al, 2004; Anderton & Carter, 2004; Krug & Reinmoeller, 2003; Bram, 2003); industrial effects in the airlines industry (Blair, 2002; Ito & Lee, 2003); in real estate (Liu et al, 2003); in insurance (de May, 2003); in reinsurance and stock markets (Brown, 2004); in options markets (Poteshman, 2003); in stock markets (Mailler & Michel, 2005; Hon et al, 2005) and in spillover affects.

Banks are key economic agents. Banking system returns are also domestic and international economic indicators. This study differs from other studies in that an international banking market model has been adapted to incorporate pure political risk ratings (reflecting political, cultural and social factors) rather than country/sovereign risk ratings (largely reflecting finance and economic factors). For example, country/sovereign

risk indicators were used by Holthausen and Leftwich, 1986; Hand, Holt and Leftwich, 1992; Cantor and Packer, 1996; Erb, Harvey and Viskanta, 1996. Fewer studies have more appropriately examined pure political risk effects in investment flows (For example, Busse & Hefeker, 2005). The study expands on the use of single period regression models by also specifying bivariate models of optimally lagged data in order to test for cointegration and exogeneity.

When pure political risk-adjusted country-banking returns are incorporated into basic banking market models it is shown that the USA banking system is a powerful exogenous force in global banking. It is demonstrated that spillover effects of an extreme terrorist act in the USA are felt in related banking systems and economies. The models possess greater explanatory power after ‘9/11’ than before. In addition, it is shown that the spillover effects are greater in developed banking systems than in the developing country-banking systems studied over the full period of the study as well as in the periods before and after ‘9/11’. The spillover effects of ‘9/11’ had not dissipated up to late 2004. Pure political risk-adjusted banking returns of the USA included in country-political risk adjusted returns models, considered with world banking stock returns, are exogenous. Therefore, new information is added by these variables which, should be of use to risk managers making portfolio diversification decisions and for banking regulators as they calculate economic and regulatory capital benchmarks of banking system safety.

References

Anderton, C H., Carter, J R., 2004, "Applying Intermediate Microeconomics to Terrorism", College of Holy Cross Working Paper, Department of Economics, August.
<http://ssrn.com/abstract=595242>

Blair, M M., 2002, "The Economics of Post September 11 Financial Aid to Airlines", *Indiana Law Review*, Vol. 35.
<http://ssrn.com/abstract=352740>

Blomberg, S B., Hess, G D., and Orphanides, A., 2004, "The Macroeconomic Consequences of Terrorism", *CESifo Working Paper Series*, No., 1151; March, Claremont McKenna College Economics Working Paper No. 2004-04
<http://ssrn.com/abstract=525982>

Bourke, P., and Shanmugam, B., 1990, "Risks in International Lending", in Bourke (Ed), *An Introduction to Bank Lending*, Chapter 12, Sydney: Addison-Wesley Publishing

Bram, J., "New York City's Economy Before and After September 11", 2003, *Current Issues in Economics and Finance*, Vol. 9, No. 2, February.
<http://ssrn.com/abstract=682622>

Brooks, R. D., Faff, R. W., Hillier, D., and Hillier, J. 2004, "The National Market Impact of Sovereign Rating Changes", *Journal of Banking and Finance*, 28, 233-250.

Brown, J R., Cummins, J D., Lewis, C M., and Wei, R., 2004, "An Empirical Analysis of the Economic Impact of Federal Terrorism Reinsurance", NBER Working Paper Series, University of Illinois, University of Pennsylvania and Georgia State University, No. 10388, March.
<http://ssrn.com/abstract=516483>

Busse, M., and Hefeker, C., 2005, "Political Risk, Institutions and Foreign Direct Investment", April, *HWWA Discussion Paper*, Hamburg Institute of International Economics, No. 315,
<http://ssrn.com/abstract=704283>

Cantor, R., and Packer, F., 1996, "Determinants and Impact of Sovereign Credit Ratings", *FRBNY Economic Policy Review*, October, 37-54.

De Brandt, O., and Hartmann, P., 2000, "Systemic Risk: A Survey", *ECB Working Paper*, No. 35, European Central Bank, Frankfurt, November.
<http://ssrn.com/abstract=258066>

De Mey, J., 2003, "The Aftermath of September 11: The Impact on and Systemic Risk to the Insurance Industry", *Geneva Papers*, Vol. 28, pp. 65-70, January.
<http://ssrn.com/abstract=377074>

Diamonte, R., Liew, J. M., and Stevens, R. L., 1996, "Political Risk in Emerging and Developed Markets", *Financial Analysts Journal*, May/June, <http://papers.ssrn.com/abstract=7883>

Dickey, D. A., and Fuller, W. A., 1981, "Likelihood Ratio Statistics for Autoregressive Time Series within a Unit Root", *Econometrica*, Volume 49, 1022-1057.

Durbin, J., and Watson, G. S., 1971, "Testing for Serial Correlation in Least Squares Regression-111", *Biometrika*, Volume 58, 1-42.

Erb, C. B., Harvey, C. R., and Viskanta, T. E., 1996, "Political Risk, Economic Risk and Financial Risk", *Fuqua School of Business Working Paper*, Duke University, May, No. 9606.
<http://ssrn.com/abstract=7437>

EViews 4 (2001), *EViews 4 User's Guide*, Quantitative Micro Software, LLC.

Ferri, G., Liu, L., and Stiglitz, J., 1999, "The Procyclical Role of Rating Agencies: Evidence from the East Asian Crisis", *Economic Notes*, 28, 335-55.

Granger, C. W. J., 1988, "Some Recent Developments in a Concept of Causality", *Journal of Econometrics*, Volume 39, 199-211.

Hamao, Y., Masulis, R W., Ng, V., 1990, "Correlations in Price Changes and Volatility across International Stock Markets", *Review of Financial Studies*, 3, 281-307.

Hand, J., Holthausen, R., and Leftwich, R., 1992, "The Effect of Bond Rating Agency Announcements on Bond and Stock Prices", *Journal of Finance*, 47, 733-52.

Hartmann, P., Straetmans, S., and de Vries, C G., 2003, "Asset Market Linkages in Crisis Periods" forthcoming in *Review of Economics and Statistics*.

Hill, C. A., 1998, "How Investors React to Political Risk", *Duke Journal of Comparative and International Law*, Volume 8, Number 2
<http://ssrn.com/abstract=333021>

Holthausen, R. W, and Leftwich, R., 1986, "The Effect of Bond Rating Changes on Common Stock Prices", *Journal of Financial Economics*, 17, 57-89.

Hon, M T., Strauss, J., and Yong, S. K., 2005, "Contagion in Financial Markets after September 11-Myth or Reality", *Journal of Financial Research*, Volume 27, 95-114.
<http://ssrn.com/abstract=392760>

Hooper, V. J., and Heaney, R., 2001, "Regionalism, Political Risk and Capital Market Segmentation in International Asset Pricing", *AFA New Orleans Meetings*, <http://ssrn.com/abstract=255176>

Hooper, V. J., Hume and Kim, 2004, "Sovereign Rating Changes-Do They Provide New Information for Stock Markets?" *Working Paper University of New South Wales*, September.
<http://ssrn.com/abstract=685661>

ICRG (International Country Risk Guide), Political Risk Services Group, 1995,
<http://www.icrgonline.com?page.aspx?=icrgmethods>

Ito, H., and Lee, D., 2003, "Assessing the Impact of the September 11 Terrorist Attacks on U S Airline Demand", *Brown University Economics Working Paper*, No. 2003-16.
<http://ssrn.com/abstract=722491>

Johansen, S, 1988, "Statistical Analysis of Cointegration Vectors", *Journal of Economic Dynamics and Control*, Volume 12, Pages 231-254.

Kaminsky, G I., and Reinhart, C M., 2000, "On Crisis, Contagion and Confusion", *Journal of International Economics*, 51, 145-168.

King, M., and Wadhvani, S., 1990, "Transmission of Volatility between Stock Markets", *Review of Financial Studies*, 3, 5-53.

Krug, B., and Reinmoeller, P., 2003, "The Hidden Cost of Ubiquity: Globalisation and Terrorism", October, *ERIM Report Series*, Reference No. ERS-2003-062-ORG.
<http://ssrn.com/abstract=463810>

Liu, C H., Kallberg, J G., and Pasquariello, P., 2003, "The Real Estate Market in the Aftermath of September 11", *EFMA 2004 Basel Meetings Paper*, December.
<http://ssrn.com/abstract=499902>

Maillet, B., and Michel, T., 2005, "The Impact of the 9/11 Events on the American and French Stock Markets", *Review of International Economics*, Vol. 13, No. 3, pp. 597-611, August.
<http://ssrn.com/abstract=758628>

Maltosky, Z., and Lianto, T., 1995, "The Incremental Information Content of Bond Rating Revisions: The Australian Evidence", *Journal of Banking and Finance*, 19, 891-902

Markowitz, H., 1952, "Portfolio Selection", *Journal of Finance*, 7, No. 1, March, 77-91.

Patterson, K., 2000, *An Introduction to Applied Econometrics*, MacMillan Press, London, pp.623-624.

Poteshman, A M., 2003, "Unusual Options Market Activity with an Application to the Terrorist Attacks of September 11, 2001", University of Illinois, January
<http://ssrn.com/abstract=370741>

Radelet, S., and Sachs, J. D., 1998, "The Onset of the East Asian Financial Crisis", *NBER Working Paper*, 6680, August

Reisen, H., and von Maltzan, J., 1999, "Boom and Bust Sovereign Ratings", *OECD Development Centre Technical Paper*, 148, June.

Roll, R., 1977, "A Critique of the Asset Pricing Theory's Tests", *Journal of Financial Economics*, 4, March, 129-176

Ross, S., 1976, "The Arbitrage Theory of Capital Asset Pricing", *Journal of Economic Theory*, 13, No. 2, December, 341-360

Sharpe, W F., 1964, "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk", *Journal of Finance*, 19, No. 3, September, pp. 425-442.

Simpson, J. L., 2002, "An Empirical Economic Development Based Model of International Banking Risk and Risk Scoring", *Review of Development Economics*, Blackwell, Volume 6, Issue 1, February, 91-102.

Straetmans, S., Verschoor, W F C, and Wolff, C C P., 2003, "Extreme US Stock Market Fluctuations in the Wake of 9/11", *AFA 2004 San Diego Meetings*, March.
<http://ssrn.com/abstract=471586>

Susmel, R., and Engle, R F., 1994, "Hourly Volatility Spillovers between International Equity Markets", *Journal of International Money and Finance*, 13, 3-25.

Appendix 1:

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests Full period of study

Sample: 12/31/1999 9/17/2004
Included observations: 1229

Dependent variable: PRUK			
Exclude	Chi-sq	df	Prob.
WORLD	3.039567	2	0.2188
PRUSA	50.74506	2	0.0000
All	110.3187	4	0.0000
Dependent variable: WORLD			
PRUK	1.316913	2	0.5176
PRUSA	26.49546	2	0.0000
All	33.28181	4	0.0000
Dependent variable: PRAUST			
WORLD	3.986414	2	0.1363
PRUSA	20.49746	2	0.0000
All	109.4474	4	0.0000
Dependent variable: WORLD			
PRAUST	1.671727	2	0.4335
PRUSA	32.14301	2	0.0000
All	33.64589	4	0.0000
Dependent variable: PRTHAI			
WORLD	8.462437	2	0.0145 *
PRUSA	3.895643	2	0.1426
All	33.62192	4	0.0000
Dependent variable: WORLD			
PRTHAI	2.110750	2	0.3481
PRUSA	28.97390	2	0.0000
All	34.09639	4	0.0000
Dependent variable: PRPHIL			
WORLD	15.65649	2	0.0004
PRUSA	1.775743	2	0.4115
All	31.66339	4	0.0000
Dependent variable: WORLD			
PRPHIL	1.636253	2	0.4413
PRUSA	32.31962	2	0.0000
All	33.60949	4	0.0000
Dependent variable: PRMAL			
WORLD	3.759182	2	0.1527
PRUSA	5.924085	2	0.0517**
All	45.25521	4	0.0000
Dependent variable: WORLD			
PRMAL	7.973887	2	0.0186
PRUSA	29.85123	2	0.0000
All	40.11273	4	0.0000

Note: All results are significant at the 1% level except for * denoting significant at the 5% level and ** denoting significance at 10% level.

Appendix 2:

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests Period before “9/11”

Sample: 12/31/1999 9/10/2001

Included observations: 440

Dependent variable: PRUK			
Exclude	Chi-sq	df	Prob.
WORLD	2.476348	2	0.2899
PRUSA	23.34173	2	0.0000
All	45.78406	4	0.0000
Dependent variable: WORLD			
PRUK	1.134551	2	0.5671
PRUSA	11.75243	2	0.0028
All	13.06983	4	0.0109
Dependent variable: PRAUST			
WORLD	0.389034	2	0.8232
PRUSA	8.019756	2	0.0181*
All	39.45290	4	0.0000
Dependent variable: WORLD			
PRAUST	3.064222	2	0.2161
PRUSA	13.58380	2	0.0011
All	15.05255	4	0.0046
Dependent variable: PRTHAI			
WORLD	1.477496	2	0.4777
PRUSA	1.259337	2	0.5328 ***
All	17.62615	4	0.0015
Dependent variable: WORLD			
PRTHAI	0.335237	2	0.8457
PRUSA	11.24989	2	0.0036
All	12.24854	4	0.0156
Dependent variable: PRPHIL			
WORLD	14.29708	2	0.0008
PRUSA	6.971671	2	0.0306*
All	16.11542	4	0.0029
Dependent variable: WORLD			
PRPHIL	0.540414	2	0.7632
PRUSA	11.79301	2	0.0027
All	12.45936	4	0.0142
Dependent variable: PRMAL			
WORLD	5.399068	2	0.0672**
PRUSA	3.034756	2	0.2193
All	19.43505	4	0.0006
Dependent variable: WORLD			
PRMAL	8.547731	2	0.0139
PRUSA	11.67367	2	0.0029
All	20.68682	4	0.0004

Note: Significance levels are at 1%. * denotes significance at the 5% level. ** denotes significance at the 10% level. *** denotes not significant.

Appendix 3:

VAR Pairwise Granger Causality/Block Exogeneity Wald Tests The Period after “9/11”

Sample: 9/12/2001 9/17/2004

Included observations: 788

Dependent variable: PRUK

<u>Exclude</u>	<u>Chi-sq</u>	<u>df</u>	<u>Prob.</u>
WORLD	4.655186	2	0.0975
PRUSA	35.93003	2	0.0000
All	72.13724	4	0.0000

Dependent variable: WORLD

PRUK	1.946276	2	0.3779
PRUSA	18.64862	2	0.0001
All	24.69023	4	0.0001

Dependent variable: PRAUST

WORLD	3.645413	2	0.1616
PRUSA	16.25579	2	0.0003
All	78.11464	4	0.0000

Dependent variable: WORLD

PRAUST	2.002863	2	0.3674
PRUSA	22.29512	2	0.0000
All	24.74846	4	0.0001

Dependent variable: PRTHAI

WORLD	5.916768	2	0.0519
PRUSA	6.801966	2	0.0333*
All	19.04793	4	0.0008

Dependent variable: WORLD

PRTHAI	2.322819	2	0.3130
PRUSA	19.71049	2	0.0001
All	25.07771	4	0.0000

Dependent variable: PRPHIL

WORLD	11.73678	2	0.0028
PRUSA	1.366100	2	0.5051
All	29.87633	4	0.0000

Dependent variable: WORLD

PRPHIL	3.727278	2	0.1551
PRUSA	23.38002	2	0.0000
All	26.52297	4	0.0000

Dependent variable: PRMAL

WORLD	13.17172	2	0.0014
PRUSA	12.39262	2	0.0020
All	46.92474	4	0.0000

Dependent variable: WORLD

PRMAL	2.795639	2	0.2471
PRUSA	20.86867	2	0.0000
All	25.56426	4	0.0000

Note: Significance levels are at 1%. ** denotes significance levels at 5%.

APPENDIX 4

DEFINITIONS OF COMPONENTS OF PURE POLITICAL RISK SCORES (SOURCED FROM ICRG, 1995)

Government stability ratings by ICRG are an assessment of a government's ability to remain in office by carrying out declared policy plans. The subcomponents of this factor are government unity, legislative strength and popular support. Socio-economic conditions relate to pressures that conspire to constrain government action or to fuel social dissatisfaction. The subcomponents in this category are the level of unemployment, the degree of consumer confidence and the level of poverty.

The investment profile factor affects the risk to investment not covered by other political, economic and financial components and is made up of contract viability and expropriation, profit repatriation, and payment delays. **Internal conflict** is an assessment of political violence in a country and its impact on governance. The highest rating means that there is no armed or civil opposition to the government and the government does not engage in arbitrary violence (either direct or indirect) against its own people. Under this rationale the lowest scores would apply to those countries where there is ongoing civil war. The subcomponents of this risk factor are thus, civil war or coups threat, terrorism or political violence, and civil disorder.

External conflict measures are an assessment of the risk to the incumbent government from foreign action, which includes non-violent external pressure (for example, diplomatic pressure, withholding of aid, trade restrictions, territorial disputes, and sanctions) to violent external pressure (such as, cross-border disputes and all-out war). The subcomponents of this category of pure political risk are cross-border conflict, and foreign pressures.

Corruption is an internal assessment of the political system. Corruption distorts the economic and financial environment and reduces the efficiency of government and business in the way the foreign direct investment is handled. Corrupt practices enable people to assume positions of power through patronage rather than ability. By so doing, an inherent instability is introduced into the political process. Examples of corruption include special financial payments and bribes, which ultimately may force the withdrawal of or withholding of a foreign investment. However, excessive patronage, nepotism, job reservations, "favour for favours", secret party funding, and suspiciously close ties between government and business have a lot to do with corruption. A black market can be encouraged with these forms of corruption. The potential downside is that popular backlash may lead to the rendering of the country ungovernable.

Military in politics is a problem because the military are not democratically elected. Their involvement in politics is thus a diminution of accountability. Other substantial ramifications are that the military becomes involved in government because of an actual or created internal or external threat. Government policy is then distorted (for example, defence budgets are increased at the expense of other pressing budgetary needs). Inappropriate policy changes may be a result of military blackmail. A full-scale military regime poses the greatest risk. Business risks may be reduced in the short-term but in the longer-term the risk will rise because the system of governance is susceptible to corruption and because armed opposition in the future is likely. In some cases, military participation will represent a symptom rather than a cause of higher political risk. Religious tensions emanate from the domination of society and or governance by a single religious group that seeks to replace civil law and order by religious law. Other religions are excluded from the political and social process. The risk involved in such scenarios involves inexperienced people dictating inappropriate policies through civil dissent to outright civil war.

The law and order components are assessments of the strength and impartiality of the legal system and popular observance of the law respectively. **Ethnic tensions** relate to racial, nationality or language divisions where opposing groups are intolerant and unwilling to compromise. The **democratic accountability** component is a measure of how responsive government is to its people. The less responsive it is the greater the chance that the government will fall. This fall will be peaceful in a democratic country but possible violent in a non-democratic country. The ratings by ICRG differentiate between alternating democracies⁵, ranging through denominated democracies, de facto one party states, de jure one party states, to autarchy⁶. In these ratings the lowest risk applies to alternating democracies and the highest risk applies to autarchies. **The institutional strength and the quality of the bureaucracy** is a measure that reflects the revisions of policy when governments change. Low risk in this area applies to countries where the bureaucracy has the strength and expertise to govern without major changes in policy or interruptions in government services. That is, bureaucracies have a degree of autonomy from political pressure with an established independent mechanism for recruitment and training.

⁵ Characterised by free and fair elections for the legislature and executive, constitutions, more than one political party, checks and balances in executive, legislative and judicial functions, an independent judiciary, and constitutional protection of human liberties.

⁶ Where leadership of the state is by a group or an individual without being subject to any franchise, either through military might or inherited right.