Winners and Losers: Assessing the Equitisation Programs in Vietnam

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Abstract

This article develops a computable general equilibrium model of Vietnam to assess the likely long-run effects of the country's equitisation programs on national economic outcomes and industries. Equitisation is found to be pro-growth as reflected in its contribution to increasing real GDP growth rate in the long run. In terms of industrial output growth rates, the winners include electrical, steel and other manufacturing, while the losers include rice and paddy, and oil, gas and petroleum. To achieve better economic outcomes, the coverage of equitisation should be extended to include medium to large state-owned enterprises across all industries.

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1. Introduction

In 1986, Vietnam introduced the *Doi Moi* (or Renovation) policy in an attempt to move the country towards a market economy. Since then, the transformation process has been slow and incomplete due to the remaining heavy influence of policies and institutions from the central planning days. During the time of central planning, many public policies were aimed at creating high protection toward domestic state-owned enterprises (SOEs). Despite these incentives most SOEs were inefficient in that they failed to lead the economy's growth. This has been a formidable challenge to government authorities. Since 1990, the government has been implementing measures to equitise

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inefficient SOEs, targeted at improving economic efficiency and competitiveness, in order to accelerate and achieve sustainable growth.

Equitisation or privatisation[1] is a worldwide phenomenon characterised as the increasing use of markets to allocate resources. It aims at improving the economic efficiency of sectors in an economy. Although privatisation seems to be accepted as a useful method to restructure the economy, it is still not clear under which conditions privatisation is successful, and how it exactly affects firm behaviour and macroeconomic performance of a country. Governments around the world privatise SOEs because of their well-documented poor performance or inefficiencies (Sheshinski & Lopez-Calva, 2003; Miljkovic, 2002). On theoretical grounds, equitisation has proven to be beneficial in improving firms' efficiency under perfectly competitive environments (Schusselbauer, 1999). However, under non-competitive environments (for instance, oligopolistic competition), equitisation may reduce rather than increase the total efficiency of an industry (Fraja, 1991; Nellis, 2007).

A number of studies on privatisation in Vietnam empirically examine the microeconomic impacts of Vietnam's equitisation program and find that it has generated positive effects on firms' performance in terms of increased output, sales and profitability, and reduced leverage (measured by the total debt/total asset ratios) (Vu, 2002; CIEM, 2003; Truong, Lanjouw, & Lensink, 2006; Truong, Nguyen, & Nguyen, 2007; Ha, 2007). Recently, Pham and Mohnen (2012) developed a general equilibrium model featuring the closed economy of Vietnam to examine the impacts of privatisation on economic growth and poverty alleviation in Vietnam. The authors find that privatisation does not contribute to job creation and welfare improvement.

Privatisation in other countries is found to generate positive macroeconomic impacts on employment, GDP growth and investment. Studies which support these findings include Boubakri and Cosset (1998) who examine 79 companies from 21 countries, Brainerd (2002) focusing on Russia, Ho et al. (2002) focusing on China, Wu (2006) investigating 34 privatised entities in Taiwan, Broadman et al. (2009) focusing on Canada's national railway company, and Boubakri, Smaoui, and Zammiti (2009) examining 56 developed and developing countries. However, there exist a number of studies having opposite conclusions including Miljkovic (2002) focusing on Yugoslavia, Cook and Uchida (2003) examining 63 developing countries, Stuckler and King (2007)

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[1] 'Privatisation' is used interchangeably with 'equitisation'—a Vietnamese term—throughout this paper, despite certain conceptual and technical differences between them.

examining 25 transition (or Post-Soviet) countries, and Moshiri and Abdou (2008) examining 117 developing and transition economies.

Given the unique features of the Vietnamese privatisation programme which differs from the usual Western privatisation programme in terms of the residual percentage of shares owned by the state and the portion of shares owned by insiders, Vietnam represents a good case study for investigating this since *Doi Moi*. The main objective of this paper is to provide answers to the following questions: (i) What are the effects of Vietnam's equitisation program on its output, employment and the structure of its labour market? (ii) How does equitisation affect different industry groups in Vietnam? and (iii) What can be done to further improve equitisation outcomes? To assist in answering these questions, a computable general equilibrium model, namely VNGEM is developed, to quantify the likely effects of equitisation on Vietnam's national economic outcomes and industries and identify the inter-sectoral changes that occur.

The rest of the article is organised as follows. Section 2 provides an overview of Vietnam's equitisation programs. Section 3 discusses the specification of VNGEM, followed by a brief description of the model database, sources of data and data treatment, model equations, model closure and simulation design. Section 4 analyses the long-run simulation results, starting with the overall macroeconomic results followed by an examination of industry results with the view of identifying the winners and losers of equitisation. Effects on employment by occupations and long-run welfare effects of efficiency gains on household consumption are also examined. Finally, Section 5 provides some policy implications for achieving effective equitisation outcomes in the future.

2. Overview of Vietnam's equitisation program

Over time, the state government has continued to maintain its high expectation of the SOE sector as an engine of growth, thereby implementing policies to support and protect it. In essence, this sector has been granted preferential treatment in access to land, export quotas, credit and government procurement contracts including favourable tax rates (Knutsen & Nguyen, 2004). Regardless of being granted many privileges, most SOEs were inefficient in that they failed to lead the economy's growth. The sources of inefficiency in the SOE sector included the uneconomically viable state-directed cross-subsidisation between profit-making SOEs and loss-making SOEs, the under-utilisation of the existing capital stock, the counter-productive state-directed managerial appointments,

and the pursuit of multiple conflicting objectives by SOEs (Kokko & Sjoholm, 2000; Cheshier & Penrose, 2007). As a result, these SOEs absorbed a very large share in aggregate investment, but their contribution to real GDP and aggregate employment was rather disappointing, compared with non-state enterprises (NSEs) and foreign-invested enterprises (FIEs). During 2010-2011, the SOE sector captured 44.5% of total investment, but its contribution to real GDP and employment was relatively low (36.7% and 10.4%, respectively). Likewise, during 2006-2008, the SOE sector contributed only 34.3% to government tax revenues (GSO, Various Issues).

In 1989, the government started to reform the SOE sector, aimed at dissolving unprofitable SOEs and improving their competitiveness. Part of the SOE Reform Programme was the process of equitisation which transformed SOEs into joint-stock companies and sold some of the shares in the company to private investors in order to improve firm performance. This initiative significantly reduced the number of SOEs from 6,545 in 1992 to 3,324 in the period 2009-2010. Between 2000 and 2010, there were 225 SOEs, on average, being reformed each year (Vu, 2005; GSO, Various Issues). In the pilot program (1992-1996), there were only five SOEs being equitised, with significantly large insider buyouts (Truong et al., 2006). During 1992-2008, the accumulated number of reformed SOEs was 4,091, of which 3,279 SOEs were equitised. According to Vu (2005) and Nguyen (2010), equitisation was accelerated to 123 cases during 1992-1998 and continued to accelerate to 833 cases during 1999-2002. During 2003-2005, equitisation was accelerated most rapidly to a record high of 2,009 cases (or 669 cases per year, on average). However, the equitisation process suddenly slowed down to 314 cases during 2006-08 (or 104 cases per year, on average).

Regardless of the increasing number of equitised SOEs, the overall equitisation process has been seen to be slow and incomplete. First, equitisation has been implemented in a lengthy and cumbersome process[2] due to fear of job losses, inconsistent asset valuation methods and conflicting ownership claims against SOE assets (O'Connor, 1996). Second, the equitisation process has been criticised for lacking transparency, benefiting only the political elites and hence discouraging the participation of private investors (Vu, 2005). Third, even though its shares have declined gradually over time, the state's political influence on equitised SOEs has never ceased (Tran et al., 2007; Nguyen,

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[2] Initially, it took three years to equitise a single firm. The equitisation process was then reduced to 13 months by 2006 and was further reduced to nine months in compliance with Decree 109 in 2007 (ADB, 2009).

2010). Finally, the equitisation of SOEs has been implemented according to the 'keeping the big and releasing the small' principle[3], which delivered very limited gains.

Vietnam's equitisation did not necessarily mean that the government lost its ultimate control over the firm. The government still held decisive voting rights in many cases (Anwar & Nguyen, 2011).

3. Methodology and Data

3.1. Model Specification

VNGEM is a comparative-static model based on ORANI-G (Horridge, 2000) and ORANI (Dixon *et al*., 1982). This model represents the Vietnamese economy with twenty four industries producing twenty four commodities, which can be produced domestically or imported from abroad. There are four margin commodities, six labour groups categorised by educational qualifications and one representative household.

In VNGEM, producers within each industry are assumed to be competitive and efficient. They are price takers in both input and output markets. Producers choose input and output levels in ways that minimise costs and maximise revenues, respectively. On the other hand, each industry can produce several commodities and one commodity can be produced by several industries. The input-output production specification is kept manageable by a number of separability assumptions. Similarly, the representative household is assumed to consume goods and services in ways that maximise its utility, subject to an aggregate budget constraint. In this case, the structure of household demand has a two-level nested form. Likewise, the nested structure of investment follows a pattern similar to that of household demand.

This paper extends the work of Pham and Mohnen (2012) by adopting a more realistic assumption of a small open economy of Vietnam. VNGEM generates results for long-run effects of equitisation on the Vietnamese economy. The model quantifies the general welfare effects of equitisation on the overall Vietnamese economy as well as identifies 'winners' and 'losers' from it. The decomposition technique in VNGEM provides detailed expositions of the sources of output growth such as an output expansion through the export channel, or the local market and domestic share channels.

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[3] The government takes dramatic steps in freeing up loss-making SOEs of small and medium size, but retains full control over strategic and profitable SOEs of larger size. According to UNCTAD (2008), there are 19 sectors in which existing SOEs will remain 100% state-owned and 27 sectors in which the state will continue to hold more than 50% of ownership.

3.2. Model Database, Data Sources and Treatment

VNGEM generates simulation results based on the 2005 input-output (I-O) database (GSO, various issues). From this, various sales and costs shares are calculated which are then used in the model. A number of behavioural parameters including intermediate substitution elasticities, household substitution elasticities, household expenditure elasticities and investment elasticities, are obtained from the GTAP database version 7.0 (Badri-Nareyanan & Walmsley, 2008) and ORANI-G (Horridge, 2000). The original I-O database contains 113 industries and 113 commodities, which are aggregated to 24 industries and 24 commodities. In addition, for simplicity, the different types of commodity and production taxes were aggregated into one commodity tax and one production tax.

3.3. Model Equations, Closure and Simulation

VNGEM has nine main groups of equations expressed largely in percentage changes, which are derived from optimisation problems facing different users (or economic agents) in the Vietnamese economy.[4] The model closure is designed for the long run due to the fact that the Vietnamese equitisation is still on-going, requiring substantial legal and institutional changes that govern the economic activities of many agents in the economy. In addition, market participants need time to adapt to the newly-regulated environment. Further, the Vietnamese government prefers to take a gradualist approach, carrying out the equitisation programs in many phases. It means the implementation of such programs will probably take a long time to be completed (for instance, 5–10 years or more). A long-run is defined to be sufficiently long enough for: (i) capital stocks in each industry to adjust such that rates of return on industry capital stocks remain unchanged; and (ii) for the economy-wide real wage to adjust to achieve full employment.

Three additional assumptions in the long-run closure include: (i) Vietnam's real balance of trade is assumed to be fixed, with real private consumption expenditure determined endogenously; (ii) the percentage changes in real investment and government consumption expenditures are indexed to that of real private consumption expenditure, in order to accommodate the balance of trade constraint; and (iii) aggregate investment follows aggregate capital stock.

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[4] The solutions to those optimisation problems, in both level and percentage-change forms, are fully documented in Dixon et al. (1982). The detailed equations are available upon request.

In terms of simulation design, VNGEM exogenises three public utility industries including electricity and gas, water, and public administration, such that their investment activities will only be affected by the long-run simulation. The choice of variable to shock is based on the fact that, the implementation of equitisation is aimed at improving efficiency and promoting competitiveness across all industries. Hence, it is expected that most of the gains from these equitisation programs will be realised as improvements in the primary factor productivity. Therefore, VNGEM is used to hypothetically simulate a 5% across-the-board primary factor productivity improvement. It is important to note that this paper does not suggest that the Vietnamese equitisation will lead to an exact 5% improvement in the primary factor productivity. Instead, it provides a numerical benchmark for investigating the direct and indirect effects, as well as identifying the winners and losers from these equitisation programs.

4. Analysis of Results

4.1. Macroeconomic Results

Long-run macroeconomic results are reported in Table 1. Results are expressed in percentage changes, which are interpreted as percentage deviations in variables with policy implementation, compared to what they would have been with no policy implementation.

Real GDP at market prices is projected to increase by 7.89%. This increase results from three sources. First, the improvement in primary factor productivity increases real GDP at market prices by 4.34%. Second, aggregate capital stock is projected to increase by 6.83%, which contributes 2.29% to the real GDP increase. This aggregate capital stock increase comes from relatively high output growth in some capital-intensive industries in Vietnam. Finally, the remaining GDP increase of 1.26% is contributed by indirect taxes collected from expanding long-run economic activities.

The overall economic expansion in Vietnam will drive up demand for labour. However, due to the fixed aggregate employment assumption, the real wage will rise at a projected rate of 6.45% in the long run. Likewise, the volume of imports is projected to increase by 7.06%. To ensure that the real trade balance is held fixed in the long run, it requires the volume of exports to increase at a slightly faster rate (7.97%) than the volume of imports. Strong export growth can be achieved through long-run reductions in the consumer price index and GDP price deflator (-4.48% and -2.2%, respectively). The

reduction in the GDP price deflator implies a real devaluation of 2.25% in the exchange rate. It means, in the long run, domestic producers will improve their competitiveness in export markets as prices of domestic goods and services become relatively cheaper.

Table 1: Long-run Macroeconomic Effects of a 5% Efficiency Increase (in Percentage Changes from the Baseline)

	Description	Percentage Changes
1	Real GDP	7.89
2	Aggregate employment	0.00
3	Aggregate capital stock	6.83
4	Real household consumption	7.49
5	Real investment	7.49
6	Real government consumption	7.49
7	Exports (volume)	7.97
8	Imports (volume)	7.06
9	Real wage	6.45
10	Consumer price index	-1.48
11	GDP price index	-2.20
12	Real trade balance	0.00
13	Real devaluation	2.25

Source: VNGEM simulation results.

On the expenditure side, three components of real gross national expenditure including real household consumption, real investment and real government consumption are projected to increase at the same rate of 7.49%. These three components chiefly explain the long-run increase in real GDP.

4.2. Industry Results [5]

Table 2 reports the long-run impacts of Vietnam's equitisation programs on industry output, employment, exports, imports and investment. In particular, output increases are found in all industries, indicating that all industries benefit from the efficiency improvement in the long run. This sub-section focuses on important and interesting results for the three most favourably affected industries and two least favourably affected industries in terms of output growth.[6]

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[5] See Appendix 1 for a brief description of the 24 industries and commodities.
[6] The results for several price- and cost-related variables are not reported in Table 2, but they occasionally appear somewhere in this sub-section to assist the interpretation of results.

Table 2: Long-run Industry Effects of a 5% Efficiency Increase (in Percentage changes from the Baseline)

		Price	Output	Employment	Exports	Imports	Investment
1	RicePad	-0.89	5.56	0.12	9.35	1.78	2.65
2	Agriculture	-0.88	6.10	0.68	5.32	5.32	2.56
3	Forest	-0.95	8.44	2.89	5.04	7.46	4.57
4	Fish	-0.58	6.32	1.01	1.55	5.82	2.71
5	Mining	-0.81	6.55	1.08	2.62	7.01	2.80
6	OGP	-1.00	5.94	0.51	5.87	7.58	2.29
7	FoodBev	-1.36	6.65	-1.49	6.73	5.00	5.48
8	ConsMat	-1.63	8.41	-0.70	10.20	4.43	7.07
9	OtherManuf	-1.21	10.88	1.38	10.76	7.89	9.50
10	Services	-3.41	10.84	0.45	17.80	5.01	9.08
11	Machinery	-1.16	10.08	1.33	9.77	6.69	9.36
12	Electrical	-0.95	11.09	2.11	10.07	8.71	9.98
13	Steel	-1.48	10.95	2.80	10.67	7.95	10.94
14	TCF	-0.99	9.71	0.46	8.70	7.81	8.59
15	Chemicals	-1.15	9.46	0.83	8.30	7.15	8.74
16	ElecGas	-2.46	8.62	-0.68	14.95	1.86	7.49
17	Water	-3.01	8.42	-0.68	0.00	0.00	7.49
18	Construct	-1.43	7.66	-1.64	0.00	0.00	6.98
19	Trade	-2.27	8.26	-1.71	9.11	6.72	9.11
20	RdWtrTrans	-2.13	7.82	-2.47	8.51	5.95	8.15
21	RailAirTrans	-1.83	8.28	-1.70	7.27	6.11	8.53
22	PostTelecom	-2.92	9.45	-0.45	11.90	4.51	8.03
23	FinInsur	-2.57	10.75	1.75	10.38	6.88	10.39
24	PubAdmin	-1.37	7.37	0.55	5.38	7.31	7.49

Note: The price variable refers to the general output price of the locally produced commodity.
Source: VNGEM simulation results.

4.2.1. Electricals (most favourably affected industry)

The electricals (Electrical) industry produces home appliances, radios, television sets and other electronic equipment, with significant contributions by private domestic firms and foreign conglomerates such as Samsung and LG. Firms in this industry are likely to adopt new technology and/or production techniques. Hence, a successful equitisation will create an environment conducive for this industry to become competitive with productivity improvements in the long run. Its long-run output is therefore projected to increase by 11.09%. Employment in this industry is projected to increase by 2.11%. The Electrical industry is relatively inward-oriented with 46.2% of its output being exported. The export price of Electrical falls by 1.08%, leading Electrical exports to increase by 10.07%. Hence, the increase in Electrical exports contributes only 4.65% to its output increase.

The expansion in industries that use Electrical as an intermediate input contributes 5.85% to the above Electrical output increase. Three major intermediate input users of Electrical output include Machinery, Electrical and Construct industries. They account for

70.9% of total intermediate usage of Electrical output. The remaining Electrical output increase (0.59%) is contributed by increased sales to household consumption and aggregate investment (0.44% and 0.15%, respectively).

4.2.2. Steel (second most favourably affected industry)

The Steel industry has been dominated by the Vietnam Steel Corporation (VSC) due to high levels of government protection. Most firms in this industry operated with poor facilities and outdated technologies such that they could only produce normal steel, leaving high-grade steel being largely imported (Kawataba, 2007). Hence, a successful equitisation may provide competitive environment for firms in this industry to improve their production capabilities. Its long-run output is therefore projected to increase by 10.95%, which is pretty close to the Electrical output increase. Employment in this industry is projected to increase by 2.8%. Unlike Electrical, the Steel industry is highly export-oriented, with approximately 79.6% of its output being exported. The export price of Steel falls by 1.5%, leading Steel exports to increase by 10.67%. Hence, the increase in Steel exports alone contributes 8.5% to its output increase.

The overall economic expansion in Vietnam will stimulate domestic demand for Steel, thereby contributing 1.7% to the above increase in Steel output. The remaining Steel output increase (0.75%) is contributed by the substitution of domestically produced Steel for imported Steel. Because the domestic price of Steel now becomes relatively cheaper, coupled with high Armington substitution elasticity, Steel products will be easily substituted away from imported sources towards domestic sources.

4.2.3. Other Manufacturing (third most favourably affected industry)

The OtherManuf industry consists of bakery and confectionery, wood products and non-ferrous metal. Similar to the Electrical industry, firms in this industry are keen on adopting new technology and/or production techniques, such as automatic production lines, especially in the production of bakery and confectionery. Hence, a successful equitisation will also create conducive environment for this industry to become third most favourably affected by the primary productivity improvement in the long run. Its long-run output is therefore projected to increase by 10.88% in response to a price reduction of 1.21%. Employment in this industry is projected to increase by 1.38%. The OtherManuf industry is export-oriented, with 63.6% of its output being exported to foreign markets. The export price of OtherManuf falls by 1.25%, leading OtherManuf exports to increase

by 10.76%. Hence, the increase in OtherManuf exports alone contributes 6.84% to its output increase.

The expansion in industries that use OtherManuf as an intermediate input contributes 2.86% to the above OtherManuf output increase. Three major intermediate input users of OtherManuf output include Construct, OtherManuf and Machinery industries. They account for 70% of total intermediate usage of OtherManuf output. The remaining OtherManuf output increase (1.18%) is contributed by increased sales to household consumption and aggregate investment (0.88% and 0.3%, respectively).

4.2.4. Rice and Paddy (least favourably affected industry)

The pace of technological progress has been slow in the rice and paddy (RicePad) industry due to the continuing adoption of traditional labour-intensive production techniques. The terms of trade for the RicePad commodity have not been favourable, resulting in moderate export earnings for this industry. Worse still, this industry has been heavily regulated by the government regarding the price and quantity of RicePad produced. As equitisation is implemented successfully, the RicePad industry may be enabled to have better performance. However, it likely becomes the least favourably affected industry as reflected in its lowest long-run output growth rate, compared with other industries. In particular, the RicePad industry remains relatively labour-intensive, with labour accounting for 55.84% of factor costs. The long-run price of RicePad decreases slightly by 0.89%, explaining its relatively moderate long-run output increase of 5.56%. At the same time, this industry experiences a rising production cost of 1%. This production cost increase is caused by a rising primary factor cost of 4.41%, which in turn is caused by two factors: (i) an increasing wage rate (4.87%) which implies a rising labour cost; and (ii) an increasing land rental rate (5.25%). Put simply, the RicePad industry experiences a cost-price squeeze in the long-run, which largely explains its moderate long-run output increase.

However, there is no significant change in this industry's employment (0.12%). The substitution of capital for labour is inelastic ($\sigma_{PR}^{(1)}{}_{(RicePad)} = 0.34$), which means even though capital becomes relatively cheaper than labour, there will be insignificant substitution of capital for labour in the long run. The export price of RicePad falls by 0.94%, leading RicePad exports to increase by 9.35%. However, the RicePad industry is highly inward-oriented, exporting about 15.5% of its output to foreign markets. Hence, the increase in RicePad exports contributes only 1.45% to its output increase.

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The remaining increase in RicePad output (4.11%) is due to an overall expansion in the economy, which increases the domestic usage of RicePad output in intermediate production and household consumption (2.95% and 1.16%, respectively). First, three major intermediate input users of RicePad output include RicePad itself, Agriculture and FoodBev. They account for 98.3% of total intermediate usage of RicePad output. Second, rising labour income translates into an increase in household consumption of RicePad by 3.93%.

4.2.5. Oil, Gas and Petroleum (second least favourably affected industry)

The oil, gas and petroleum (OGP) industry produces crude oil, gas, petroleum and lubricants and is almost 100% state-owned. While crude oil is largely exported, petroleum is largely imported because Vietnam has limited capability in producing such product to supply in the domestic market. It is therefore extremely difficult to achieve equitisation in this industry unless the government shows a strong willingness to hand its controlling power to private participants. Although equitisation is essential for improving the performance of the OGP industry, it likely becomes the second least favourably affected industry as reflected in its second lowest long-run output growth rate, compared with other industries. In particular, the OGP industry is relatively capital- and land-intensive, with capital and land together accounting for 72.9% of factor costs. The long-run price of OGP decreases slightly by 1%, explaining its moderate long-run output increase of 5.94%. This industry experiences a rising production cost (2.54%). This production cost increase is caused by a rising primary factor cost of 4.17%, which in turn is caused by two factors: (i) an increasing wage rate (4.87%) which implies a rising labour cost; and (ii) an increasing land rental rate (7.48%). The OGP industry also experiences a cost-price squeeze in the long run, which largely explains its moderate long-run output increase.

However, there is also no significant change in this industry's employment (0.54%). The substitution of capital for labour is also inelastic ($\sigma_{PR}^{(1)}{}_{(OGP)} = 0.21$), which means that even though capital becomes relatively cheaper than labour, there will be insignificant substitution of capital for labour in the long run. The export price of OGP falls by 1.01%, leading OGP exports to increase by 5.87%. OGP is the most export-oriented industry in Vietnam, exporting about 98.3% of its output to foreign markets. Hence, the increase in OGP exports alone contributes 5.77% to its output increase.

The remaining increase in OGP output (0.17%) is due to an overall expansion in the economy, which increases the domestic usage of OGP output in intermediate

production. OGP output is sold to all industries in Vietnam, with the top 10 domestic users accounting for 76.9% of total usage of OGP input.

4.3. Employment by Educational Qualifications

In the long run, the real wage will increase and nominal wages will also increase at a uniform rate of 4.87% adjusted for the reduction in the CPI (Table 3). Although the economy is assumed to reach its full employment level, there will be some changes in the composition of occupations in the long run. In particular, there will be reductions in demand for low-skilled workers (-0.1% for NoSkill and -0.07% for Elementary). The skill mix will then be allocated towards medium- and high-skilled workers, especially towards CollegeDeg and ProfSecond qualifications (0.28% and 0.24%, respectively). This is because the expanding industries, especially capital-intensive industries, will also expand their investment activities in accumulating more capital, machinery and equipment in the long run. To work with these newly-invested technologies, machinery and equipment, the economy needs to acquire more medium- and high-skilled workers.

Table 3: Long-run Employment by Educational Qualifications (in Percentage Changes from the Baseline)

	Qualifications	Wages	Employment
1	UniDegree	4.87	0.19
2	CollegeDeg	4.87	0.28
3	ProfSecond	4.87	0.24
4	VocTraining	4.87	0.06
5	Elementary	4.87	-0.07
6	NoSkill	4.87	-0.10

Note: The six labour groups categorised by educational qualifications include university degree (UniDegree), college degree (CollegeDeg), professional secondary (ProfSecond), vocational training (VocTraining), elementary (Elementary) and unskilled (NoSkill), which are ranked from highest to lowest skilled, respectively.
Source: VNGEM simulation results.

4.4. Welfare Effects of Efficiency Gains

According to Fane and Ahammad (2003), there have been two different concepts of equivalent variation (EV) being used to measure the welfare effects of policy changes. The first one is derived from the balance of trade function (referred to as EV^{BOT}), which can be defined as an increase in foreign exchange received from abroad resulting in the same utility change as the policy change. The second one is derived from the money metric utility function (referred to as EV^{MMU}), which can be defined as an extra amount of income allowing consumers to reach the utility that they actually reach as a result of the policy change (assuming prices faced by consumers are unchanged). This EV^{MMU} is used

in VNGEM to estimate changes in household consumption as an indicator of welfare changes.[7]

From Table 1, efficiency gains will generate positive welfare effects on the economy since the aggregate long-run household consumption is projected to increase by 7.49%. This is reflected in the increased consumption of all commodities in the long run (Table 4). The long-run nominal wages will increase at a uniform rate of 4.87% (positive income effect). In addition, the long-run consumer prices of almost all commodities will decline (positive substitution effect), except for the price of Construct which remains unchanged. It means consumers gain by their relative income increases and relatively cheaper goods and services, thereby explaining the long-run increases in household consumption. In Vietnam, there are eight main consumer goods including commodities: RicePad, Agriculture, Fish, FoodBev, Services, TCF, Chemicals, Trade, which altogether account for 83.7% of total household consumption.

Table 4: Long-run Welfare Effects of Efficiency Gains on Household Consumption (in Percentage Changes from the Baseline)

	Industries	Consumer Prices	Household Consumption
1	RicePad	-0.96	3.93
2	Agriculture	-0.91	5.97
3	Forest	-1.06	7.35
4	Fish	-0.66	6.75
5	Mining	-0.82	7.28
6	OGP	-0.33	7.05
7	FoodBev	-1.17	6.50
8	ConsMat	-1.34	7.53
9	OtherManuf	-0.82	7.19
10	Services	-3.12	10.59
11	Machinery	-0.62	7.06
12	Electrical	-0.48	6.97
13	Steel	-0.63	7.07
14	TCF	-0.84	7.06
15	Chemicals	-1.26	7.47
16	ElecGas	-2.43	8.34
17	Water	-3.01	8.73
18	Construct	0.00	6.75
19	Trade	-1.86	9.19
20	RdWtrTrans	-1.31	7.69
21	RailAirTrans	-1.09	7.55
22	PostTelecom	-2.51	8.50
23	FinInsur	-1.17	9.78
24	PubAdmin	-1.07	8.59

Source: VNGEM simulation results.

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[7] Despite notable differences between the two measures, decomposing each measure has certain weaknesses such that neither is definitely superior to the other (Fane & Ahammad, 2003). Note that VNGEM does not decompose the measure of welfare changes since it is not the primary objective of this article.

4.5. Sensitivity Tests

To test the robustness of the model's macroeconomic results, two sensitivity tests are conducted as follows.[8] The first sensitivity test is conducted by doubling and halving the value of each of the following three important parameters: (i) Armington substitution elasticities between domestic and imported sources ($\sigma^{(1)}_{(c)}$); (ii) transformation elasticities of output ($\sigma_O^{(1)}{}_{(i)}$); and (iii) individual export demand elasticities ($\gamma_{(c)}$). This sensitivity test confirms that the macroeconomic results are sufficiently robust to withstand changes in the above parameters.

Likewise, the second sensitivity test is conducted by doubling and halving the simulated value of the across-the-board primary factor productivity ($a_{PR}^{(1)}{}_{(i)}$). This sensitivity test indicates that almost all macroeconomic variables have nearly one-to-one (or symmetric) responses to changes in $a_{PR}^{(1)}{}_{(i)}$. For instance, halving the value of $a_{PR}^{(1)}{}_{(i)}$ will cut both short-run and long-run real GDP growth rates by half, while doubling its value will double such growth rates; similarly for other macroeconomic variables. Therefore, the macroeconomic results are sufficiently robust to withstand changes in $a_{PR}^{(1)}{}_{(i)}$. Intuitively, the greater the primary factor productivity improvements, the better the results, and vice versa. This is one of the main policy implications discussed in the next section.

5. Policy Implications

The findings of this study have some important policy implications. The Vietnamese equitisation is pro-growth, as reflected in the increasing real GDP growth rate. Policy makers need not worry about the temporary negative employment shock because the amount of redundant workers in the SOE sector will soon be absorbed in the private sector, provided that the latter receives adequate treatment to grow to its full potential (Chan et al., 2005).

Vietnam's equitisation programs will improve the competitiveness of domestic producers through price reductions. Hence, they will perform well in the export markets and that export expansion will contribute greatly to GDP growth. Intuitively, the government should create a policy environment conducive for the domestic export-oriented and export-related industries (such as the TCF industry). If the government is concerned about job creation, it should stop picking specific industries and let some

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[8] Due to space constraint, the results of these sensitivity tests are not reported in this sub-section, but are available upon request.

labour-intensive activities in agriculture and light industries (such as RicePad, Agriculture, Chemicals, Machinery, and Electrical) expand.

The simulation results above show that the demand for high-skilled workers will increase in the long run. Therefore, the government should have a long-term plan to develop domestic human capital through education and research and development, in order to acquire a sufficient number of high-skilled personnel to work with new technologies, machinery and equipment into the future. To do this, the government should reallocate its spending budget towards these activities, which can be financed from two sources: (i) government savings from waste: in the short term, the government can cut wasteful subsidies on inefficient SOEs and reduce waste from idle capital stock within the state sector; and (ii) revenue from a broader tax base: in the long term, the government will have a broader tax base, and hence increased tax revenue, due to expanding economic activities in the private sector.

To date, equitisation has been applied only to small and unprofitable SOEs across many non-strategic industries, according to the 'keeping the big and releasing the small' principle. This has been one of the main causes of a slow and incomplete equitisation process. Such an equitisation principle is no longer appropriate. To achieve greater outcomes, a full coverage of equitisation is required, which means equitisation should be extended to include medium to large SOEs across all industries. In so doing, the total effect of productivity improvement will become significantly larger, contributing more to the increase in real GDP.

To speed up the equitisation process, Vietnam can learn from China's experience, especially with respect to the equisation of SOEs (Garnaut et al., 2005). First, greater participation of local governments must be encouraged to make the equitisation process more flexible, and equitisation of large SOEs must be attempted to reduce significantly the costs of equitisation.

Second, to compensate SOE employees who lose their jobs due to equitisation, Vietnam should maintain comprehensive compensation and incentive schemes, in order to convince SOE employees to not resist the equitisation process, but accept and support it. In 1999 and 2002, Vietnam had already established the equitisation funds and the worker redundancy fund, respectively, to serve this purpose, but these funds were inadequately used and managed such that significantly large amounts of idle funds remain (Nguyen, 2010). Instead of wastefully subsidising SOEs and equitised SOEs, these funds need to be redirected towards compensating the adversely-affected workers and other creditors,

providing more effective training and re-training facilities, and promoting the role of outside investors in the equitisation process.

Third, Vietnam should continue to promote the private sector by creating a policy environment that will improve the quality, rather than quantity, of private sector development.

Fourth, Vietnam should improve the fairness and transparency of the equitisation process by imposing regulations on: (i) the disclosure of information; (ii) the establishment of an orderly process of ownership transformation; and (iii) the expansion of the role of outside investors. Further, the process of transferring property rights must be made public and competitive through auctioning, public bidding and agreed transfer. With respect to asset valuation, Vietnam should establish a number of asset management companies acting as independent valuation professionals. To encourage more buyers of the state assets, the government should give them discounts for assuming more social obligations such as paying workers' compensation and other related payments, or to redeploy employees in ways that minimise the number of layoffs.

Fifth, in Vietnam, inside buyers of state assets are authorised to participate in the equitisation process, especially management buyouts. It may happen that some managers of equitised SOEs deliberately run the firms down before equitisation, in order to lower the equitisation prices. To prevent this moral hazard, poor-performing managers must be prohibited from buying state assets and, at the same time, outside buyers should be encouraged to compete in purchasing these equitised SOEs. In other instances, some SOEs subject to equitisation may use bankruptcy to evade paying back debt. Therefore, the government must not process bankruptcy cases if the main intention is to escape debt. Further, there must be some regulations aimed at strengthening the firms' management of their debt liabilities and preventing them from avoiding paying debt. Generally, any equitisation plan needs mutual agreement among workers and creditors before it can be implemented to ensure that workers will be fairly compensated and creditors will be guaranteed receipt of their debt repayments.

Sixth, to provide checks and balances in an enterprise, Vietnam needs a new structure of corporate governance consisting of a shareholder conference to make decisions on investment and profit distribution, a board of directors to undertake audit functions, and a board of supervisors to investigate the firm's financial health. Firms should appoint some legal representatives to handle complicated legal issues and ensure

that all business activities are legitimate. To prevent any conflict of interests and moral hazards, the chief executive officer and the chairman must be two separate people.

Finally, the government should not interfere in the firms' decisions, especially on managerial appointment, employment and wage rates. Instead, there should be an appropriate institution and regulatory framework to deal with the employment and wage-related issues. That is, the government should withdraw its direct involvement in economic activities and focus on macroeconomic stability and providing public goods.

Appendix 1

Table 1: A Brief Description of the 24 Industries/Commodities in VNGEM

	Industries/Commodities	Description
1	RicePad	Rice & Paddy
2	Agriculture	Agriculture
3	Forest	Forestry
4	Fish	Fishery
5	Mining	Mining
6	OGP	Oil, Gas & Petroleum
7	FoodBev	Food & Beverage
8	ConsMat	Construction Materials
9	OtherManuf	Other Manufacturing
10	Services	Services
11	Machinery	Machinery
12	Electrical	Electricals
13	Steel	Steel
14	TCF	Textile, Clothing & Footwear
15	Chemicals	Chemicals
16	ElecGas	Electricity & Gas
17	Water	Water
18	Construct	Construction
19	Trade	Trade
20	RdWtrTrans	Road & Water Transportations
21	RailAirTrans	Rail & Air Transportations
22	PostTelecom	Post & Telecommunication
23	FinInsur	Finance & Insurance
24	PubAdmin	Public Administration

Note: Trade, RdWtrTrans, RailAirTrans and FinInsur are categorised as margin commodities.

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