Impacts of Import Liberalization Policy on Economic Growth in Vietnam: A Channel Analysis

DINH Thi Hoang Yen*

* Ph.D. Student of Department of International Development, GSID, Nagoya University

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Abstract

Vietnam, a transitional economy that started its historic economic reform in 1986, has been pursuing both the market-oriented and state-controlled developments for more than twenty years. This study focuses on the country's liberalization on internal and international trade polices, an important path of economic reform, by measuring an index for import liberalization policy and then employing "channel analysis" to quantify impacts of import liberalization on the country's economic growth. The study applies the method proposed by Wacziarg (2001) to Vietnamese data for the period 1986-2006 with necessary revisions to accommodate features of the Vietnamese economy. The estimated results by 3SLS regression indicate positive impact of import liberalization on economic growth once the full information of linking channels (government expenditure, macroeconomic quality, black market premium, domestic trade, FDI and exports) have been accounted for. The study concludes that one unit increase of import liberalization index improves economic growth rate by 0.304 percentage point. Of this, increase in technological capability of exports, macroeconomic stabilization, and the efficiency domestic trade is the prominent factors, each occupies roughly 25-30% of the overall channels' impact.

1. Introduction

Debates on the role of trade in economic development center on how trade can be an engine of growth and how to measure this benefit. History seems to support the success of import liberalization in USA in 1940s and Japan in 1960s, as well as the export promotion achievements of Asian Tigers in 1970-80s. Although researchers generally agreed that "trade is good for growth", quantitative analyses have shown different results on the link between trade more precisely, trade liberalization and economic growth.

There are three main reasons why empirical results are different. Fist, the choice of indicator for trade liberalization can be either actual outcome or theoretical trade (Leamer 1988). Besides, trade incidences strongly influence the outcome of trade, especially trade restrictive measures and non-tariff barriers (Sachs and Warner 1995, Andriamananjara and Nash 1997). Second, the choices of

explanatory variables for economic growth in countries that carry out trade liberalization are different, such as accumulation and productivity (Frankel and Romer 1999), extent of market (Ades and Glaeser 1999). Third, analysis methodology has become more sophisticated due to the need to investigate the "black box" linkage between trade liberalization and growth, rather than simple correlation analysis or single equation regression. The idea of channel analysis has been suggested in the work of Salvatore (1983), Fisher (1993), Sprout and Weaver (1993), Wacziarg (2001), and Jenkins (2004). More importantly, the channels via which trade policy give impacts on growth depend on country specific situation (Harrison 1996, Rodriguez and Rodrik 1999).

The approach of Wacziarg (2001), focusing on investigation of the channels between trade policy and economic growth, was used as the basis for this research. By this approach, a composite trade openness index was first estimated, and a simultaneous model by three-stages least squares (3SLS) method was established. It should be stated that the application of Wacziarg's (2001) approach for time series data is superior to other approaches that separately use partial channel analysis to evaluate the impact of an inextricable set of economic reforms initiated since 1986 to Vietnam's economy, of which import liberalization is the most fundamental innovation.

Various studies on the Vietnamese trade liberalization, in particular import liberalization process, have been carried out since the country's economic reform, mainly under the auspices of the World Bank[1]. Although all the researchers concluded that Vietnamese trade liberalization was on the right track, still it has been hard to observe whether trade liberalization has spurred growth. To our knowledge, no study has applied channel analysis to pinpoint the connections between the import liberalization policy and economic growth in Vietnam. Though there have been a number of studies using computable general equilibrium (CGE) model for Vietnam's import liberalization[2], CGE model are generally not capable of endogenously emulating technology improvement.

It is obvious that the import liberalization policy can not fully function without connection with other macroeconomic policies, and this nexus needs to be investigated to inform efficient execution of the on-going globalization process in Vietnam. As a transitional economy, Vietnam's imports were controlled by various barriers. The liberalization process was hardest in terms of lifting such controls. Although the range of government control on importation was narrowed down to machinery, equipments, and necessary inputs for domestic production, the payment bills increased quickly with the need for investment at the lower stage of economic development. In short, the liberalization process generally reduced the average tariff rate, increased the trade deficit, and challenged the government's capability to maintain macroeconomic stability.

The objectives of this study are first to feature the Vietnam government's liberalization policy on imports and then to identify its relation with other important renovation policies which collectively impact on economic growth in Vietnam. The structure of the paper is as follows: Section 2 evaluates Vietnamese import liberalization process by looking into changes in the import partners, import

management regime, import structure, and tariff over the past 20 years (1986-2006) to come up with identification of an import liberalization index (Mlib). Section 3 revisits and modifies Wacziarg's model to specify the most important policies closely involved with the import liberalization process of Vietnam. Section 4 shows the estimated results of impacts by the decomposed six channels. Finally, Section 5 concludes the work.

2. Import Liberalization Process and Import Liberalization Policy Index of Vietnam

2.1 Import Liberalization Policy and Changes of Imports

For Vietnam economy, the Sixth Congress of the Communist Party in 1986 is considered as milestone to pave the way for the market-oriented economy under state-controlled development. Accidentally, the country's economic reform was carried out just before the collapse of the Berlin Wall in 1989 which changes the international political and economical situation and, particularly, helps Vietnam expand its international economic relations by "diversified and multilateral economic relations with all countries and economic identities on the principle of mutual respects on independence, sovereignty, equality and benefits"[3]. The Paris Club meeting for resuming ODA for Vietnam in 1993 initiated the normalization process with a number of international financial institutions and economic organizations during the 1990s. At the beginning of 2007, Vietnam has bilateral trade agreements (BTAs)[4] with almost countries in the world, mostly signed after 1993. The number of trading partners increased from solely 10 socialist members of Council for Mutual Economic Assistance to about 200 countries and territories. The twenty first century marked an intensive and extensive integration of Vietnam with the world economy, beginning with the bilateral trade agreement with the United State of America (USA) in 2000, economic cooperation under Association of South East Asian Nations (ASEAN) plus framework[5], and the World Trade Organization (WTO) in 2007.

Intensifying trade relations has helped Vietnam streamline and modernize its trade management meeting both international rules and the country economic development situation. In parallel to the development of various liberalization process issues, the institutional and legal framework was created and continuously reformed. The way of import-export management changed from quantitative restrictions (quotas, targets, plans, licenses, and sole traders) to the transparent rule of law and market-oriented incentives. Vietnam's trade policy has been consistent for export promotion and import substitution simultaneously, backing the inherent role of the state sector. During the preparation for world economic integration period (2001-2006), a tremendous number of trade activities were legalized, conforming to the WTO regulations. Notably in 2001, a long term import export management mechanism was introduced by the Decision 46/2001/QD-TTg (Decision 46), replacing the annually revised management regime. Features of such trade policy are summarized in the Appendix 1, describing Vietnam's liberalization process which limits consumer goods import while preserving financial resources for machinery and fuels imports (about 30% and 60% of total imports,

respectively).

Raising tariffs and controlling trade by para-tariffs, quantity controls and minimum import price were frequently used to protect import substitution industries, together with encouraging export oriented industries. Vietnam's Import-Export Duties Law was first introduced in 1987, and was then revised several times toward broadening a Harmonized System (HS) tariff base, moving tariff lines into the range of 0-5%, and extending the days for tariff payments for imported inputs of exporting industries. Since 1996, Vietnam has applied (1) the Common Effective Preferential Tariff for ASEAN countries (CEPT/AFTA) and (2) the Most Favored Nations (MFN) for countries which have signed BTA with Vietnam, and normal rate (equals 150% corresponding MFN rate) for the rest of countries.

Besides, Vietnam strictly controlled foreign exchange for trading companies by requiring foreign exchange surrenders and foreign exchange allocations for imports of consumer goods. Vietnam fixed its currency with the USSR's Ruble and the State controlled all foreign exchange usage until 1989, and then turned to managed-float exchange rate system. Official exchange rate was determined within the inter-bank market with a band of 1% or 2% from time to time. At the time of the 1997 Asian financial crisis, Vietnam tightened its foreign exchange management, notably the regulation on trading companies' foreign exchange earnings (in 1998, 80% of foreign exchange earnings had to be surrendered to State Bank of Vietnam). Though Vietnam did gradually free its foreign exchange system after the crisis and abolished the surrender requirement in 2003, chronic trade deficit was still the main challenge to the foreign exchange management of the State Bank of Vietnam.

The outcome of the import liberalization policy is demonstrated in Table 1. Total import value increased on average 17.7% per year, from about USD 2 billion in 1986 to USD 45 billion in 2006. Import dependence which is the ratio of total import value over GDP (M) increased rapidly; from 8.2% in 1986 to 50% in 2000 and to nearly 74% in 2006. Meanwhile, the simple average tariff was slightly raised slightly from 10.7% in 1992 to 13.4% in 1997 and to 17.4% in 2006. Under the WTO commitment, starting from 2008, Vietnam is scheduled to reduce its simple average to 13.4% in 6 to 11 years. Though the tariff revenue increased the ratio of tariff revenue over total import value decreased after 1995.

Table 1 Vietnam's Total Import Value, Import Dependence, and Average Tariff

	1986	1992	1995	1997	2000	2002	2006
Import value (Bn. USD)	2.2	2.5	8.2	11.6	15.6	19.7	44.9
Import dependence ratio (%)	8.2	25.7	39.3	43.2	50.2	56.3	73.7
Simple average tariff (%)	-	10.7	12.8	13.4	-	15.7	17.4
Tariff revenue (% of imports)	6.8	5.1	13.9	8.3	5.3	6.6	3.5

Source: Author's compilation from GSO and Athukorala (2006)

2.2 Import Liberalization Index

It is important to select an appropriate indicator to quantify the changes in the import liberalization process in Vietnam. Presumably, import liberalization depends mostly on the extent of

restriction caused by the tariff and non-tariff barriers (NTBs). As the tariff rate has fallen over the years, there were more concerns regarding removal of NTBs. In order to conduct quantitative analysis of the impact of import liberalization, an import liberalization index and its weights for NTBs and tariff barriers are necessarily constructed.

The aforementioned analysis on the Vietnamese import liberalization policy indicates that the liberalization period was from 2001 onward contingent on the hallmark of Decision 46. Therefore, a time dummy for NTBs removal for Vietnam (DUM) was assigned as 1 for the period 2001-2006 and 0 for the previous period (1986-2000). The tariff rate is another indicator for liberalization. However changes in tariff rate are incomparable across time as the tariff base changed, widening the total tariff lines. So as a proxy for average tariff rate, import tax revenue over total import (TARIFF) was used.

Import dependence ratio was chosen as the dependent variable for the regression to find the weights of NTBs and TARIFF. Using 3SLS method, M was regressed on income level (INCOME), tariff revenue over total imports (TARIFF), and import liberalization dummy (DUM) in Eq. (1). As instrumental variables, the level of international communication (Isolation[6]), industrialization (Industrial Labor), the endowment of land under cereals production (Land), and the difference between growth rate of export prices and growth rate of import prices (ToT) were chosen. The import liberalization policy index (Mlib) in Eq. (2) is a weighted index of TARIFF and DUM with weights being the corresponding estimated coefficients in Eq. (1). It is expected that $\delta_3 < 0$, $\delta_4 > 0$, so the higher the number of Mlib (smaller in absolute value), the more liberalized the import policy.

(1) $M = \delta_1 + \delta_2 * INCOME + \delta_3 * TARIFF + \delta_4 * DUM$

Instruments: Isolation, Industrial Labor, Land, ToT

(2) $Mlib = \hat{\delta_3} * TARIFF + \hat{\delta_4} * DUM$

The estimated results of Eq. (1) are given in Table 2. The value of Mlib index reflects the liberalization period (-21.9 on average during 2001-2006), and has a much lower value in the pre-liberalization period (-48.3 on average during 1986-2000). The Granger causality test confirmed the causalities of Mlib, TARIFF, and DUM to M. Besides, the estimation results for Eq. (1) without DUM variable presented in the last two rows of Table 2 reveals the robustness of negative value of the TARIFF variable.

Table 2 Estimated Results of Eq. (1)

	Const.	INCOME	TARIFF	DUM
Coeffs.	37.603[***]	10.618	-6.615[**]	7.044
t-stat	*3.783*	*1.647*	*-2.455*	*0.259*
Coeffs.	35.247[***]	12.362[***]	-7.195[***]	
t-stat	*3.359*	*10.308*	*-5.825*	

Note: [***] 1% of significance, [**] 5% of significance

Source: Author's calculation

3. Impact Channels of Imports Policy to Growth in Vietnam: Analytical Framework

3.1 Brief Revisit of Wacziarg's Impact Channels and Estimation Method

In Wacziarg (2001), interactions between trade policy and economic growth through several channels were investigated in order to capture the most effect of trade policy on growth. Specifically, impacts on economic growth were stipulated through three main groups. Each group was then decomposed into two channels: government policy (including the macro policy quality and the government size), allocation and distribution (including price distortion and factor accumulation or domestic investment), and technological transmission (including share of manufactured exports and share of FDI in GDP).

Trade openness enhances growth through an ideal mixture of virtuous macroeconomic policies such as monetary expansion, lower budget deficit, and external debt in the long run. In other words, openness creates incentives for government to reform its style of governance towards less distortions and more economic efficiencies to increase growth. Though the government size may increase especially when there are external shocks, the increase in government size is not always beneficial for growth due to the crowding out effect to private investment and the distortions of taxation. Therefore, the transmission impact of openness to growth through government policy group is still ambiguous, depending on the balance between the positive benefits of a virtuous set of macroeconomic policy and the negative costs of government's distortions.

Arguments on allocation and distribution are rooted in classical economic theory dominated by comparative advantage theory that countries can mutually benefit by trade and specialization in their most efficient production. But competition is constrained by market size so trade liberalization may provide a big push for investment in general and for capital goods in particular. Another assumption is that price is flexible, therefore trade liberalization facilitates price convergence, and countries with open trade policies would have lower overall price and a lower degree of price distortions, which is better for growth than closed ones.

The dynamic gains from trade are drawn from recent endogenous growth theory which stresses the crucial role of technology renovation and productivity in the development process. The dynamic gains from trade to economic growth can be grasped through Total Factor Productivity (TFP) improvement, especially through spillover effect of FDI and the innovation effect of export. Trade liberalization exposed domestic producers to the imitation of technology originating from industrial countries, as the successful case of transforming structure of exports from agriculture to heavy industry and finally to high-tech goods in East Asian countries. FDI often comes with trade liberalization and brings in the country modern capital goods and diffusion of expertise, which can spur growth greater than just the pecuniary value of FDI.

With the assumption that the above six channels capture the total effect of trade policy on growth, Wacziarg (2001) constructed a structural model, composed of six equations for each channel, and one

growth equation, and estimated them jointly by the 3SLS method. This method achieves consistency by combining the assumption of random data, the features of instrumental variables in dealing with endogenity, and the efficiency of generalized least squares regression. Wacziarg (2001) employed a full set of instrumental variables to feature modern development of economic growth theories, especially determinants of the spatial model and macroeconomics model.

3.2 Analytical Framework

We followed the idea, estimation method, and some instruments of Wacziarg's work as explained above to identify the determining factors for the impact of import liberalization on growth in Vietnam during the period 1986-2006. However, different from Wacziarg (2001) this work does not include exports in the openness index, instead we use import liberalization index which shows clearly the removal of State control on imports by tariff and NTBs. Meanwhile exports that are not prohibitive by Vietnamese government are included in the impact transmission channel from import liberalization to economic growth. Besides, Wacziarg (2001) uses investment to show both size and quality effect (by increase in inflow of capital goods and by increasing returns to scale due to specialization). Here, the size effect of investment to growth is directly measured by the capital variable and the quality effect is by TFP in growth equation in which dependent variable is growth rate, not growth rate per capita like Wacziarg (2001). Instead, domestic trade (DTRA) was added as one variable representing the efficiency in allocation and distribution of goods and services, not only the efficiency in allocation and distribution of capital as in traditional theory. The underlying assumption is that the increasing participation of non-state sector in domestic trade is better for economic growth when trade is liberalized in Vietnam.

Apart from that, Wacziarg (2001) model applies for cross-country analysis while this analysis applies time-series for country study. Therefore, the choice of variables, instrument, as well as proxy for variables has to be changed to fit the situation of Vietnamese economy. For example, we do not need democracy index, island dummy, ethnolinguistic fractionalization, or postwar independence variables to control the difference between countries. In stead, several variables for population and education, such as the male and female life expectancy, ODA, number of FDI projects, share of secondary and above pupils out of total population, number of students at university and colleges, and percentage of urban population are called for.

At aggregate level, the production function of an economy can be expressed by a Cobb-Douglas function:

$$Y = AK^{\alpha}L^{1-\alpha}$$

Where, A denotes level of technology, K physical capital, and L labor. Differentiation with respect to time yields Solow's relation with dotted letters designating the change in quantities.

$$\frac{\dot{Y}}{Y} = \frac{\dot{A}}{A} + \alpha\frac{\dot{K}}{K} + (1-\alpha)\frac{\dot{L}}{L}$$

Based on this simple single form where growth rate is assumed to depend only on the growth of

technology, physical capital, and labor, a list of six variables is augmented in place of the technology (TFP) determinant to capture the dynamic gains. The modified equation of the GDP growth is given in Eq. (3). Lower case denotes the growth rate (y, k, and l), and six channels are government expenditure (GOV), macro policy (MACRO), price distortion (BMP), domestic allocation and distribution (DTRA), technical capability of improving international competitiveness by exports (X), and technology transfer (FDI). Those six variables help explain the TFP improvement when the import liberalization occurs. Instruments are selected from the best representative variables which describe the country's characteristics, namely labor by gender, schooling, population density, ODA, and terms of trade shocks.

(3) $y = \mu_1 + \mu_2 * k + \mu_3 * l + \mu_4 * GOV + \mu_5 * MACRO + \mu_6 * BMP + \mu_7 * DTRA + \mu_8 * FDI + \mu_9 * X$

Instruments: Male, Female, Pop15, Pop 65, College, Density, ODA, FDI projects, ToT

Then, a system of structural equations is constructed to include the role of Mlib in all channel equations while every main variable is elucidated by the other channel variables. The specification of each variable follows the arguments of empirical studies on trade-growth nexus together with analysis on the Vietnamese import liberalization and macroeconomic circumstances. Analyses of the six channels are represented in the following.

3.2.1 Channel 1: Government size (GOV)

The government size is an important indicator of public involvement in the economy. From the point of view of free market and invisible hand philosophy, the less involvement of government the better for the economy. However, the role of government is usually crucial in developing countries due to the lack of basic infrastructure ranging from roads, bridges, ports, schools, hospitals to financial and legal system. While some studies have found that the government size negatively affected growth (Edwards 1992, Barro 1989), the evidence from export-led economic growth in Asian countries pointed out the crucial role of infrastructure assisting exports. Vinold et al. (1990) listed a number of inefficient infrastructure problems that may constrain the supply response to policy change, particularly a weak system for providing duty-free and restriction-free access to imported inputs, inadequate port, transport and telecommunications facilities, and poor information and marketing services for exporters. Therefore, the whether more government is good for Vietnam's economic growth or not still remains uncertain.

In Vietnam, government plays a prominent role in the economy with the ultimate goal of developing and stabilizing the business environment according to market rules. The government expenditure increased recently, account for 32% of GDP in 2006 from just 20% in 1986. Though education, health, and other social services are socialized, the major part of government expenditure is recurrent spending (52.54% 2006, down from 72.5% in 1986). On average 1986-2006, the state capital expenditure took into account for 27% of government expenditure. The state investment at the constant 1994 price was account for 53.8% of total investment in the society, of which 25.6% was

from state budget, 13.6% from state loans, and 14.6% from SOEs and other sources (mostly ODA). Half of the state investment in the period 2000-2005 went to infrastructure development including electricity, gas, water supply, transport, storage, and communication because Vietnam still lacked both soft and hard infrastructure, which are crucial for transmitting the impacts of trade on economic growth. The quality of government might be more important than the government size. However, it is impossible to measure the efficiency of the government's policy intervention through a composite index. So to seize the impact of the government spending or its intervention in the economy, the ratio of total government expenditure over GDP is chosen value for variable GOV. The equation for the government expenditure (Eq. (4)) is specified in connection with Mlib, macro policy quality (MACRO), and the exchange rate distortion (BMP). These two variables are chosen as they are directly connected with fiscal policy and the macro economic stability situation which is the central duty of Vietnamese government. The expected sign of ε_2 is negative, implying the decreasing the role of government when the country registers a stronger liberalization process and the increasing role of private sector. Besides, ε_3 is expected to be positive and ε_4 negative, reflecting the contribution of better quality of macroeconomic policy and adverse impact of price distortion to the size of the government, respectively.

(4) $GOV = \varepsilon_1 + \varepsilon_2 * Mlib + \varepsilon_3 * MACRO + \varepsilon_4 * BMP$

Instruments: Pop15, Pop 65, Density, Industrial labor

3.2.2 Channel 2: Macro Policy Quality (MACRO)

MACRO is another policy performance indicator beside the GOV variable to capture the stabilization of macroeconomic policy. One of the valuable lessons from the experiences of the East Asia's economic success is the maintenance of macroeconomic stability, which comprises low fiscal deficits, low inflation rates, and stable-adequate exchange rate (Vinold et al. 1990). Macroeconomic stability is likely to favorably affect growth by reducing price uncertainty and moderating public deficit and debt levels, thereby reducing crowding out and strengthening domestic firms. In the absence of macroeconomic stability, policy credibility, and enforcement of contracts, it is unlikely that a country will be able to enter significantly high growth rates for a sustained period in an open trading environment (Panagariya 2004).

The biggest task of the Vietnam government at the beginning of the reform was to stabilize the macroeconomic situation. The country was in stagflation with hyperinflation up to 874.7% in December 1986. The monetary reform in 1985 denominated 10 old VND by 1 new VND and liberalized domestic price but failed to curtail inflation and restore the investment motivations until the first half of 1990s.

However, Vietnam's fiscal budget, deriving mainly from oil production revenue, SOEs profit and foreign assistance, was persistent in deficit. As a result, state debt piled up and was financed mostly by the use of cash balances from domestic banks and external borrowings. The country's macro economic

management has therefore been focused on fiscal and monetary stabilization policy. This is reflected in a composite index of three macro variables: external public debt levels in GDP (z_1), government deficit share in GDP (z_2), and the difference between the growth of broad money M2 and real output growth (z_3). The construction of MACRO is outside the system like Mlib that is why eq. (5) is excluded from the system. The weight of z_1 through z_3 is 1/3 and the value of them ranges from 1 to 21 according to the ranking order in the observation period. Macro economic policy index (MACRO) is then calculated by Eq. (5). The higher the index the better the policy. MACRO index is higher during the period 2001-2006 than the previous period, at 13 compared to 10.2.

(5) $MACRO = \tfrac{1}{3} * z_1 + \tfrac{1}{3} * z_2 + \tfrac{1}{3} * z_3$

(6) $MACRO = \eta_1 + \eta_2 * Mlib + \eta_3 * GOV + \eta_4 * BMP$

Instruments: ToT, ODA, Industrial labor

Eq. (6) shows the relation of MACRO variable with Mlib and two variables of fiscal and monetary policy, i.e. government size (GOV) and black market premium of foreign exchange (BMP). It is expected that $\eta_2 > 0$ so that the import liberalization gives positive impact on macroeconomic environment. Besides, the expected sign of η_3 and η_4 is negative, showing the reverse impact of excess government consumption and price distortion on the macroeconomic policy.

3.2.3 Channel 3: Black Market Premium (BMP)

Foreign exchange policy is another crucial macroeconomic instrument, especially in open economies, due to its direct influence on imports and exports. Overvaluation is likely to emerge especially when (1) there is a deep inconsistency between the domestic aggregate demand and the exchange rate policy or (2) when the government tries to maintain a low level of exchange rate in order to counteract transitory confidence or balance of payments deficits (Rodriguez and Rodrik 1999).

Vietnam does not tend to meet the first condition because the deficit in the balance of payment can be financed by the FDI and the overseas remittance. However, the Vietnamese dong has been being devalued gradually, from VND/USD 80 in 1986 to the range of VND/USD 10,000-12,000 before 1997, and VND/USD 14,000-16,000 after that. The difference between official and free parallel market VND/USD, termed as the black market premium (BMP), is chosen as an indicator for the price distortion because it reflects totally and instantly the Vietnamese foreign exchange management policy. In 1997, the market exchange rate promptly depreciated while Vietnamese dong was devalued with time lags making BMP widen. As a result, exports and imports retrenched instantly, but government spending and macroeconomic indicators were also deteriorated.

The BMP variable is specified in the Eq. (7), with the expected signs of $\gamma_2 < 0$, connoting import liberalization brings in less distortions on exchange rate thanks to the virtuous macroeconomic management and the narrower gap between domestic and foreign price. Government expenditure (GOV) and total domestic demand (DTRA) are selected as explanatory variables for BMP to reflect the state managed floating exchange rate system and the booming domestic consumption in Vietnam.

The corresponding expected sign of coefficients are $\gamma_3 < 0$ and $\gamma_4 > 0$, indicating the adverse impact of overspending in government consumption and dynamic effect of the development of domestic trade to managed floating exchange rate system.

(7) $BMP = \gamma_1 + \gamma_2 * Mlib + \gamma_3 * GOV + \gamma_4 * DTRA$

Instrument: Density, School, ToT

3.2.4 Channel 4: Domestic Trade (DTRA)

DTRA variable is the proxy for allocation and distribution channel showing the direct relation between service sector and production sector and the level of demand for private consumption. Relating to TFP, the dynamism and expertise of logistics help to enhance productivity of the production sector. First, when trade is liberalized, pressure from foreign competition push domestic trade system become more efficient, therefore improvement in domestic trade will help to increase the productivity of production sector which use the services of distribution system. Second, not only production sector can benefit from more efficient distribution system. All industries in the economy that use the output of other industries as their inputs can also benefit from lower input cost as a result of better functioned distribution system.

Vietnam's domestic trade was occupied by state coupon system until the late 1980s. It was replaced by the market mechanism with the participation of foreign sector in 1994. Though the domestic retails sales system was still tattered and spontaneous, both infrastructure and management, the volume of domestic sales grow steadily on average at 17.2% annually and accounts for 80% of total final consumption. In 2007, Vietnam's growth rate of domestic retail trade was ranked 4th in the world, after India, Russia, and China (Dinh 2007). With the fast economic growth rate and young population, the Vietnamese domestic retail trade (DTRA) is surely a channel connecting import liberalization with domestic production and consumption.

The ratio of deflated non-state domestic trade of goods and services over GDP is proxy for DTRA. This ratio shows the freer participation of private and foreign sector in domestic trade, replacing the "coupon" system when state totally keeps control over allocation and distribution of goods and services. Eq. (8) estimates DTRA with explanatory variable, Mlib and export (X), representing the relation between international and domestic trade. It is expected that import liberalization and exports will stimulate domestic retail trade, indicated by $\lambda_2 > 0$ and $\lambda_3 > 0$.

(8) $DTRA = \lambda_1 + \lambda_2 * Mlib + \lambda_3 * BMP + \lambda_4 * X$

Instruments: Urban, ToT, Density

3.2.5 Channel 5: Foreign Direct Investment (FDI)

For developing countries, FDI is the fundamental source of technological transmission and productivity improvement. International fragmentation of production is usually carried out by FDI firms. Thanks to their learning externalities, developing countries are able to move to greater growth under free trade than autarky (Goh and Wan, 2005). FDI variable is used here not to explain the

increase in investment but the externalities of FDI such as technological improvement, demonstration effects to domestic enterprises, or labor trainings.

Most of studies on FDI sector in Vietnam have shown the positive relation between FDI and trade liberalization, and FDI and growth, particularly in terms of capital inflows for investment and vertical technology spillover [7]. Vietnam's Law on Foreign Investment was issued in 1987 and then continuously revised in favor of FDI. By November 2007, 68.55% FDI implemented investment is for industrial and construction sector, 6.93% for agriculture, forestry and fishery, 24.52% for service sector. When the economy was still closed, the state sector is dominant in industrial production and trade but the industrial output and export value of FDI sector (including petroleum) have increased rapidly (from 0% in 1988 to 39% of total industrial output and 57.2% of total exports in 2006) and since 2003 outweighed that of state sector. However, the real impact of FDI, especially the spillover impact is questionable due to the suspension of FDI after the Asian financial crisis, and the connection of FDI to Vietnamese economy is not tight during the period.

FDI variable is valued by the share of FDI sector's industrial output in total industrial output at constant price (including oil and gas). The position of FDI in Vietnamese economy is explored at macro level by Eq. (9) specifies the determinants of FDI share of industrial output are Mlib and black market distortion (BMP) which reveals the interconnection of foreign investment and foreign exchange policy. To examine complementary impact of import liberalization to FDI, it is expected that $\theta_2 > 0$ and $\theta_3 < 0$.

$$(9)\ FDI = \theta_1 + \theta_2 * Mlib + \theta_3 * BMP$$

Instruments: Urban, ODA, College, ToT

3.2.6 Channel 6: Exports (X)

The last channel investigated to find the increase in international competitiveness by technological capability is exports. Like FDI, the learning effects of exports accumulate mostly in manufacturing industries. The desirable measurement for manufacturing exports is share of heavy and light manufacturing industries over total exports. However, it is usually the case that data for exports are unclassified separately mineral and cottage exports. Vietnamese main export groups are: (1) heavy industrial product, mineral products (on average 27.94% during 1986-2007), (2) light industrial exports and handicrafts (32.27%)[8], and (3) agriculture, forestry and aqua fishery (39.79%).

With total export value passed the mark of USD 40 billion in 2006 from the starting point of about 800 million USD in 1986, exports is an indispensable connector of import liberalization and economic growth in Vietnam. In order to measure the increase in technological capability, proxy of exports is the share manufacturing products exports out of total exports. However, due the problem of available statistical data, the share of heavy and mineral export out of total exports is used for exports (X). In Eq. (10), X is assumed to be explained by import liberalization (Mlib) and foreign exchange management (BMP). It is expected that $\omega_2 > 0$ and $\omega_3 < 0$ since the freer imports may transmit

technology content to exports and black market premium may discourage exports.

(10) $X = \omega_1 + \omega_2 * Mlib + \omega_3 BMP$

Instruments: ToT, Land, Urban, College

In brief, the analytical framework for the system of transmission channels from trade liberalization to growth is illustrated in Figure 1. Main variables in the model are import liberalization (Mlib), growth rate (y), and three layers to group six channels. The direction of arrows shows the channels' impacts. Labor (l) and capital (k) are the original variables of the growth equation. The instrument variables are written on the left hand brackets under the main variables, while the variables for regression estimated outside the system to construct the indices are on the right hand brackets.

Figure 1 Conceptual and Analytical Framework
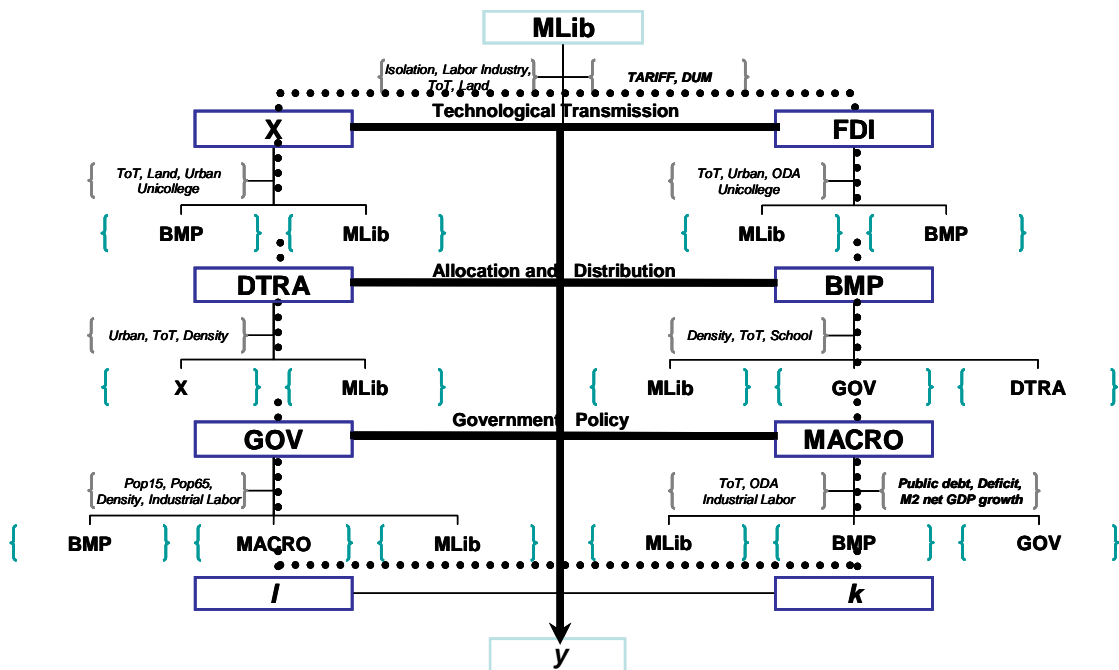
Source: Author's modification from Warcziarg (2001)

4. Data Processing and Estimated Results

The system as created above incorporates seven endogenous variables (y, GOV, MACRO, BMP, DTRA, FDI, and X), three exogenous variables (Mlib, k, and l), and the predetermined instrumental variables. All the equations in the system are linear as specified in equations from Eq. (3) to Eq. (10), except Eq. (5) and are estimated simultaneously by 3SLS estimation[9]. The joint estimation method for a simultaneous system of equations has the advantages of ensuring the endogeneity and the more flexible assumption on stochastic disturbance terms.

Definitions and source of data for variables are listed in Appendix 2. The sample period is from 1986 to 2006. The capital stock was estimated assuming the capital output ratio during 1980-85 (3.615) and equal to incremental capital output ratio in 1986. The proxy for trade liberalization status

is dummy variable (DUM), proxy for macro policy quality is index (MACRO). All variables denominated in USD are converted into VND, and deflated by appropriate deflator to obtain figure at VND constant 1994 price. The main variables are in percentage form, either growth rate or share.

Table 3 represents the estimated results of each equation by 3SLS method. The number in quotation marks corresponds to the equation number. Equation (3') is the similar to equation (3) but omitted FDI variable. The prior checks of pair-wise correlation matrix of variables in the system have indicated the relatively low multicolinearity of variables in every equation of the system. The sign of estimated coefficients attached to Mlib for six channels and the variables included in growth equation are all match with priori assumption except FDI variable in Eq. (3).

Table 3 Estimated Results of Equations in the System

Coeffs.	(3) y	(4) GOV	(6) MACRO	(7) BMP	(8) DTRA	(9) FDI	(10) X	(3') y
Const.	-25.86**	-84.427	18.176***	-1346.9***	51.071***	47.524***	41.27***	-46.47**
t-stat	*-1.950*	*-1.280*	*8.779*	*-7.232*	*29.902*	*11.059*	*15.243*	*-2.064*
Mlib		-0.071	0.146**	-0.822	0.183***	0.385***	0.230***	
t-stat		*-0.129*	*5.920*	*-1.474*	*3.412*	*4.709*	*4.581*	
K	1.742***							0.310
t-stat	*2.806*							*0.641*
L	7.065							10.859**
t-stat	*1.310*							*9.278*
GOV	0.004		-0.018	-4.089***				-0.097**
t-stat	*0.075*		*-1.130*	*-14.531*				*-1.164*
MACRO	0.350	15.284***						0.558*
t-stat	*1.368*	*3.735*						*1.676*
BMP	-0.055	-0.596***	-0.003			-0.170***	-0.111***	-0.036
t-stat	*-1.289*	*-7.355*	*-0.525*			*-10.954*	*-12.538*	*-1.451*
DTRA	0.099			31.475***				0.450
t-stat	*0.294*			*8.996*				*1.042*
X	0.350**				0.276***			0.420***
t-stat	*2.476*				*3.412*			*3.008*
FDI	-0.442**							
t-stat	*-2.363*							
Obs.	19	21	21	21	21	21	21	21

Note: *** 1% of significance, ** 5% of significance, * 10% of significance.

Source: Author's calculation

The estimated sign of FDI in Eq. (3) is not as theoretically expected and therefore gives reverse effect to the overall channel impact. This persistent problem of impact from FDI variable may be explained by three possibilities. First, it is the lack of spillover effect from FDI enterprises to domestic enterprises. Second, the data of FDI industrial output by industry for the period 1986-2006 is unavailable and using the share of FDI industrial output over total industrial output may overlook the characteristics of industries. Third, the turbulence of Asian financial crisis seems to affect the FDI inflow into Vietnam. Thus, based on these considerations, an additional calculation was performed at

which FDI channel was dropped[10]. Still, the results of the modeling attempt are stable, excluding that the sign GOV variable in Eq. (3) changes from positive to negative. This result is understandable because the government's overburden usually limits the quality of the administrative system. But when liberalization process continues, government size should be smaller due to the tax revenue shrinking and the increasing role of private sector. Such two factors are jointly multiplied and provide higher impact to economic growth

A summary of effects through every channel is exhibited in the Table 4. Estimated coefficients of import liberalization variable (Mlib) in channel equations indicate their effect on each channels and show in the column (M).The estimated coefficients of channel variables in the growth equation when variable FDI is dropped (Eq.(3')) indicate the effect of each channel on growth and show in column (C). The multiple of two coefficients therefore gives the indirect effect of import liberalization on growth and shows in column (M*C). These indirect effects through channels are added up. Results of decomposing the overall impact of Vietnam's import liberalization on growth into specific components are displayed in the last column of Table 4.

Table 4 Summary of the Channel Effects (Without FDI Channel)

Channel	Effect of Milb on channels (M)	Effect of channels on growth (C)	Effect of Mlib on growth (M*C)	Decomposed effects of Mlib on growth
GOV	-0.195	-0.097	0.019	5.57%
MACRO	0.166	0.558	0.093	27.30%
BMP	-1.121	-0.036	0.040	11.92%
DTRA	0.194	0.450	0.087	25.73%
X	0.238	0.420	0.100	29.48%
Total effect of Mlib on growth through channels			**0.304**	**100%**

Source: Author's compilation

Firstly, we can see that Mlib has strengthen the position of all channels, highlighted their productive role to economic growth and implying TFP improvement. The overall impact is 0.304% point to enhance growth rate of Vietnam. This result is quite promising as Vietnam's GDP growth rate is 6.85% on average of study period and 8.48% in 2007.

Decomposed effects of Mlib on growth prove that industrial export (X), macroeconomic stabilization (MACRO) and total domestic trade of goods and services (DTRA) are the major factors for import liberalization process to boost up growth. The role of government (GOV) and foreign exchange management (BMP) are also productive channels with the share of 12% and 5.6% respectively. It is sensible that technical capability accelerated faster through exports as the result of diversifying trade partners after the liberalization of imports. Import liberalization enhances macro economic stability which is the combination of rational state borrowings, judicious fiscal spending, and manageable monetary market. Also, liberalization of imports provides cheaper imported goods to domestic market, makes domestic traders work more efficiently to compete at foreign standards and trading customs. All of those three channels expand growth and the multiplied impacts by import

liberalization to each channel help each occupies nearly 30% of the overall impact.

These results are quite interesting and reasonable, implying the correctness and effectiveness of the development policy of Vietnam which recognizes benefit of open door policy to the world economy, emphasizes on stabilization of macro economic environment while privatizing domestic trade sector. Furthermore, the stabilization policy is strengthened by a rational managed float foreign exchange system and the more and more streamlined public services and transparent administration of the government.

5. Conclusions

Given the results of all estimations and analyses, it is safe to conclude that the improvement in allocation and distribution efficiency (composed of DTRA and BMP) was the most transmission channel of import liberalization impacts to economic growth (accounts for 37.65% of total channel impact) in Vietnam during the period 1986-2006. The group of macro policy quality (composed of MACRO and GOV) almost has the same positive impact (32.87%), and the technology transmission group (only X) has a subsequently lower effect (29.5%). Overall, one unit of increase in Mlib instigates growth rate by 0.304 % point.

This conclusion is realistic for the growth success of Vietnam since the economic reform policy aims at opening up international trade, keeping stability of the macro economic environment, as well as facilitating domestic private sector. In other words, when imports were liberalized, the productivity of the economy has been upgraded. Although the role of technology transmission from FDI was not visible, it is undeniable that FDI is an important source of investment and foreign exchange. If the country promotes exports of more manufactured goods and elevates FDI's technology transfer, impacts of import liberalization to growth will be enlarged.

From a clear view from different economic aspects, the study confirms the growth situation of Vietnamese economy in the period of 1986-2006 and quantifies the transmission mechanism to such growth outcome after combination economic reforms are undertaken. Though the role of government will be transferred to the private and foreign sectors, government's functions in concerting the competitive macroeconomic environment are everlastingly indispensable, particularly the control economic turmoil and the deterrence of potential shocks to the economy in the globalization era. Beside FDI, ODA is an important external resource for economic development in Vietnam, especially for infrastructure building and technical assistance.

Though the specification of equations is modified for the Vietnamese reform during the period of 1986-2006, the model can be extended to include more variables and different set of instrumental variables. An import liberalization index may be constructed from a more sophisticated index. Quality of government management should be measured carefully as government size may not fulfill this task. This study is a small attempt to understand and evaluate the situation in Vietnam prior to WTO accession. Vietnam is in a critical process of implementing WTO commitments for a comprehensive

import liberalization, which requires deeper research.

Notes

[1] E.g. Plummer (1995), Dollar (2002), Athukorala (2006).

[2] Simulations by CGE models were given by Pham (2003), Nguyen and Ezaki (2007).

[3] See the Resolution of the Party's 7th National Representative Congress on 27 June, 1991.

[4] According to Document 0622/BTM-PC dated 26 January, 2007, Vietnam has MFN treatment in trading goods with 164 countries and territories including 27 EU countries, of which 149 countries are WTO members. Besides, Vietnam has preferential treatments in trading with 11 countries, of which 9 countries are ASEAN members.

[5] Since 2000, ASEAN has worked out important agreements on comprehensive economic cooperation with China, Japan, India, Korea, Australia, New Zealand, and EU, but only ASEAN-China Free Trade Area (ACAFTA), and ASEAN-Korea Free Trade Area (AKAFTA) agreements had been signed in 2005. ASEAN-Japan FTA reached agreement in 2008 and are waiting for ratification by member countries.

[6] Variable "Isolation" means the degree of the development of the communication system with other country, which is proximate by the number of telephone lines per 1000 people.

[7] See Le V.A. (2007), and Le Q.H. and Richard Pomfret (2008) for more details.

[8] Out of total light industrial and handicraft export volume, garments, textile and leather industries accounted for about 27% in 1987, boomed after the mid 1990s and then took about 50% recently. Meanwhile, out of total heavy and mineral exports just started in 1989 at about 59% and on the decreasing trend as the preparation for the development of domestic oil refinery industry.

[9] The ordinary least squares (OLS) estimation method for multivariate single equation is widely used in econometrics. However, it does not show the interrelation between endogenous variables and requires a strict set of assumption of data that are normally distributed and uncorrelated with the residuals in the equations. OLS and SUR estimations were also performed and the results appeared quite resembles 3SLS estimation but less statistically significant.

[10] The study of Le and Pomfret (2008) also found the negative horizontal linkage between FDI and domestic enterprises in Vietnam using firm level data during 2000-2004. If excluding oil and gas sector from FDI industrial output, the coefficient is still negative. Also, the data of FDI inflow seem to be overlapped since there is always time lag between implemented projects and registered projects.

References

Andes Alberto F. and Gleaser Edward. 1999. Evidence on Growth, Increasing Returns, and the Extent of Market. *The Quarterly Journal of Economics*. Vol. 1999: 1025-1945.

Andriamananjara Shuby and Nash John. 1997. Have Trade Policy Reforms Led to Greater Openness in Developing Countries: Evidence from Readily Available Trade Data. *World Bank Research Working Paper*. Vol 1730.

Athukorala Prema-chandra. 2006. Trade Policy Reforms and the Structure of Protection in Vietnam. *World Economy*. Vol. 29 (2): 161-187.

Barro Robert J. 1989. Economic Growth in a Cross Section of Countries. The Quarterly Journal of Economics. Vol. 106 (2): 407-443.enges. *Policy Research Working Paper*. WPS3076. The World Bank. East Asia and Pacific Region. Povery Reduction and Economic Sector Unit.

David Dollar. 2002. Reform, Growth, and Poverty in Vietnam. *Policy Research Working Pape*r. WPS 2837. The World Bank. Development Research Group. Macroeconomics and Growth.

Decision 46/2001/QD-TTg of the Prime Minister, 4 April 2001, Management on Import Export Commodities in the Period 2001-2005

Dinh Thi My Loan. 2007. Vietnam's Retail Market in the Post-WTO Period and the Competition Control Activities in this Domain. Socio-economic Information and Forecast Journal. Vol. (22):42-45. (In Vietnamese).

Edwards Sebastian. 1992. Trade Orientation, Distortions and Growth in Developing Countries. *Journal of Development Economics*. Vol. 39: 31-57.

Frankel Jeffrey A. and Romer David. 1999. Does Trade Cause Growth? *The American Economic Review*. Vol. Vol. 89 (3): 379-399.

Goh Ai-Ting and Wan Henry Y. 2005. Fragmentation, Engel's Law and Learning. *Review of International Economics*. Vol. 13 (3): 518-528.

Harrison Ann. 1996. Openness and Growth: A Time-Series, Cross-Country Analysis for Developing Countries. *Journal of Development Economics*. Vol. 48: 419-447.

Jenkins Rhys. 2004. Globalization, Production, Employment and Poverty: Debates and Evidence. *Journal of International Development*. Vol. 16: 1-12.

Le Quoc Hoi and Richard Pomfret. 2008. Technology Spillovers from Foreign Direct Investment in Vietnam: Horizontal or Vertical Spillover? *Working Paper Series*. Vol. 085. Vietnam Development Forum.

Le Viet Anh. 2007. *Foreign Direct Investment, Productivity, and Economic Growth: A Case Study of Vietnam 1986-2004*. PhD Dissertation. Nagoya University

Leamer Edward E. 1988. Measures of Openness. *Trade Policy Issues and Empirical Analysis*. National Bureau of Economic Research. Chicago: University of Chicago Press.

Nguyen Tien Dung and Ezaki Mitsuo. 2007. Regional Economic Integration and the Impacts on Growth, Poverty and Income Distribution. The Case of Vietnam. *Forum of International Development Studies*. Vol (33). Graduate School of Internation Development. Nagoya University.

Panagariya Arvind. 2004. Miracles and Debacles: In Defence of Trade Openness. The World Economy. Vol. 27 (8): 1149-1171.

Pham Thi Lan Huong. 2003. The Impacts of Vietnam's Accession to the WTO on Income Distribution Using a General Equilibrium Framework. *Asia Pacific School of Economics and Government Working Papers*. The Australian National University.

Plummer Michael. G. 1995. An Analytical Survey of Vietnam's External Policy Challenges. *Journal of Aisan Economics*. Vol. 6 (3): 327-349.

Rodriguez Francisco and Rodrik Dani. 1999. Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-National Evidence. *NBER Working Paper Series* 7081. National Bureau of Economic Research.

Sachs Jeferey J. and Warner Andrew. 1995. Economic Reform and Process of Global Integration. *Brookings Papers on Economic Activity*. The Brookings Institution. Vol. 1995 (1): 1-118.

Salvatore Dominck. 1983. A Simultaneous Equations Model of Trade and Development with Dynamic Policy Simulations. *Kyklo,. International Review for Social Science*. Vol 36 (1): 66-90.

Sprout Ronald V.A. and Weaver James H. 1993. Exports and Economic Growth in a Simultaneous Equations Model. *The Journal of Developing Areas*. Vol. 27 (3): 289-306.

Vinod Thomas, Kazin Matin and John Nash. 1990. Lessons in Trade Policy Reform. The World Bank: 1990.

Wacziarg Romain. 2001. Measuring the Dynamic Gains from Trade. *The World Bank Economic Review*. Vol. 15 (3): 393-429.

Appendix 1: Summary of Vietnam's Trade Liberalization Policies

	Criteria	Transition from CMEA bloc (1986-1990)	Diversified trade relations (1991-2000)	Preparation for world trade integration (2001-2006)
1	Institutional policy	Renovation policy launched, Ministry of Foreign Trade, Ministry of Domestic Trade and Ministry of Materials merged into Ministry of Commerce (MOC).	MOC changed to MOT, Trade Promotion Center established, Commercial Law and BOP statistics introduced	MOT and MOI merged into MOIT, Commercial Law revised, Administration on Competition Dept established.
2	Im-Ex tariff policy	Introduced Law on Im-ex tariff, 0% tax for exports (exclude natural resources).	Three times revisions of Law, introduced HS, CEPT/AFTA, extended tax payment to nine months, reduced the maximum tariff rate to 60%	IL for the period 2001-2006: 76% by 2003, 87% by 2005, and 100% by 2006; reduced GEL to 95 lines, the rest SL, Law revised according to WTO rules
3	Minimum import price	State approval for trade contracts.	Introduced State-managed import price list and the list of minimum import price (if price contract is lower than 70% of regulated price)	Introduced Custom valuation and abolished managed import price.
4	Excise tax	Exempted excise tax for exports (6 types of goods).	Exempted for 2 years, 8types of goods and 4 types of services, deducted for automobile and golf	Lowered excise tax rate.
5	VAT & surcharges		Set up Stabilization Fund, surcharges levied on price difference of exports, imports, and domestically produced goods; set up stabilization reserves for distribution of petroleum, fertilizer, cement, and rice; Introduced VAT	Abolished surcharges for NPK fertilizer, narrowed down VAT levels from five to three and broadened VAT exemption.
6	Licenses, quotas, & administrative controls	State managed targets were legalized and fulfilled by supplying materials and other necessary production conditions. In 1989, abolished import-export plan for enterprises.	Import bans for consumer goods were used to limit 20% of total import (sugar, automobile, used goods); Import licenses and quotas were used to protect domestic import-competing industries (notably fertilizer, cement, paper, sugar, electronics, motorbike, automobile; and widened the coverage to construction materials, chemical materials, bicycles, vegetable oil in 1998-1999); Import plan and sole traders requirements were used to back SOEs (petroleum, steel, cement, fertilizer, rice, fibers);	Decision 46: im-ex management for the period 2001-2005, abolished license except export license for garments and textiles but the Government preserves the right to interfere on rice export and petroleum and fertilizer imports if necessary. Temporarily stopped the localization ratio requirement for automobiles and motorbikes; managed trade by laws (Ordinance on Price, NT and MFN, Safe-guard measures in 2002, applied tariff-quota in 2003, Ordinance on anti-dumping, countervailing, Competition Law in 2004).
7	Market access		Decree 02: lists of goods and services prohibited and conditionally traded in domestic market (10 and 22).	Decree 11: list of goods and services prohibited, restrictively traded, and conditionally traded (10, 5, 14 in 1999, and 23, 8, 90 in 2006).
8	Export promotion	EP targeted agriculture, forestry, fishery, exploration and mining, light industries, handicraft.	Established EPZ in 1991, IZ in 1994 with more tax incentives if export 80% of total output; Export Award Fund in 1998 for enterprises of high export growth rate (20%), Export Promotion Fund in 1999 to develop agricultural exports, new exports, new markets.	Decision 156: approval for export promotion plan for the period 2006-2010, aiming at trade surplus beyond 2010.
9	Trading rights	Decree 128: two types of trade enterprises (central: have direct trading rights and local) and export-import associations.	Decree 114: requirement for trading companies; Decree 33: reduced the capital requirement for companies in remote areas; Decision 55 list of products need registration but Decree 57 in 1999 liberalized the right to import and export of all domestic enterprises.	
10	Foreign exchange surrender	Multi-exchange rate system, State control on foreign exchange usages. In 1989, internal exchange rate system of trading companies was diminished.	Prohibition on deferred payments for imports of consumer goods and regulation on sales of excess earnings to banking system (80% in 1998, 50% in 1999), to preserve priority for petroleum, fertilizers, and steel imports.	Control on foreign exchange surrender reduced to 40% in 2001 and then totally relaxed in 2003.
11	Trade relations	Member of CMEA.	CMEA collapsed in 1991; renewed membership with IMF, WB, ADB in 1992; obtained GATT observer status in 1994; joined ASEAN in 1995, ASEM in 1996, APEC in 1998, BTA with USA in 2000.	ASEAN + China in 2002, ASEAN + India, ASEAN ; Japan in 2003, WTO member approval in 2006.

Source: Author's compilation from online National Legal Database of Vietnam

Variable	Definition	Source
Endogenous variables		
BMP	Distortions, black market premium on official exchange rate, average of period (parallel market rate minus official rate/official rate, as a percentage)	SBV
DTRA	Total domestic trade deflated by GDP deflator as a share of GDP at constant VND 1994 prices	GSO
FDI	Foreign direct investment, share of industrial output in total industrial output, at constant 1994 price	MOIT
GOV	Government expenditure deflated by GDP deflator as a share of GDP at constant VND 1994 price	GSO
M	Imports dependence ratio, imports as a share of GDP, VND constant 1994 price	GSO
TARIFF	Ratio of tax revenue over total imports, tax revenue deflated by GDP deflator	GSO
X	Export value of heavy industry , share of total exports, at USD price	GSO
z_1	Ranking across the years of ratio of external public debt/GDP, at USD	ADB
z_2	Ranking across the years of ratio of budget deficit/GDP, at current VND	MOF
z_3	Ranking across the years of growth of M2 net growth rate of GDP, M2 at VND current price and deflated by GDP deflator	ADB
k	Growth rate of capital stock, at constant VND 1994 price	GSO
l	Annual growth rate of population	GSO
y	Growth rate of GDP, GDP at constant VND 1994 price	GSO
Instrumental variables		
College	Number of thousands of students at university and colleges	GSO
Density	Logarithms of population density	GSO
Female	Female life expectancy at birth	WB
FDI dum	Number of authorized FDI projects	GSO
INCOME	Logarithm of GDP, VND at current price	GSO
Isolation	Number of telephone mainlines for 1000 person	WB
Land	Logarithm of land under cereal production	WB
Male	Male life expectancy at birth	WB
ODA	Log of ODA, current USD, converted to VND and deflated by GDP deflator	WB
Pop15	Population under 15, share of total population	WB
Pop65	Population over 65, share of total population	WB
School	Secondary and above pupils, share of total population	GSO
ToT	Terms of trade shocks: growth rate of export prices minus growth rate of import price	GSO
Urban	Percentage of urban population	WB