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# Trade Reform and Macroeconomic Policy in Vietnam*

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## Abstract

The Asian crisis and the more recent global economic slowdown changed Vietnam's terms of trade adversely.  Results from a global macro-model confirm that the consequences were a rural contraction exacerbated by deflation and consequent slower overall employment and GDP growth. Further simulations show that a unilateral trade policy reform could return the economy to its growth benchmark even while export demand remains slack.  Although the short run gains from trade reform are directionally robust, their magnitude depends on the prevailing macroeconomic policy regime.  If capital controls are to remain tight, a flexible exchange rate regime is superior to a fixed rate, since it frees monetary policy to combat deflation.  In this case lost tariff revenue should be made up through direct taxes to preserve the fiscal deficit.  If capital controls are ineffective, however, the gain in investment is larger and this changes the monetary and fiscal policy rankings.  A fixed exchange rate regime is then more effective and an expanded fiscal deficit is growth enhancing in the short run.

## 1. Introduction:

Vietnam is a largely agrarian country in which the current trade policy regime protects key processing and manufacturing sectors. High levels of economic growth were achieved in the decade following the "renovation" reforms of the late 1980s, which liberalized price-setting, devalued and unified the exchange rate, reduced subsidies to state-owned enterprises (SOEs) and improved private property rights. Total exports grew rapidly, overall economic growth was maintained at an annual rate above seven per cent and the proportion of rural households classified as being in poverty declined (World Bank 1999). The trade policy regime remained distortionary, however, favouring capital-intensive manufacturing over other sectors, including light or labour-intensive manufacturing. The growth inspired by the renovation reforms tended to make it easier for the government to continue to direct new investment to capital-intensive sectors that were largely state-owned. Yet Vietnam's comparative advantage is clearly in labour-intensive manufacturing and this will be ever more the case as technical change releases Vietnam's vast rural labour reserves.

The high growth of the 1990s was achieved, however, in the context of a decade of sustained economic growth in the industrial countries of the world, led by a boom in the US. During 2000, however, the US stock market ceased its expansion and first the wider US economy, then the world economy, began to slow down. The US economy contracted more than a percent through the third quarter of 2001 and its industrial production contracted more than six per cent (*The Economist*, December 2001). This helped to shift the international terms of trade against commodity exporters like Vietnam. Moreover, the financial crisis that afflicted several developing countries in 1997-98 left a number of commodity exporting countries with substantial debts to service. In these countries, consumption was squeezed and exports grew. US$ commodity prices fell nine per cent in the year to September with food commodities falling more than four per cent on average and non-food agricultural commodities falling more than 16 per cent (*The Economist*, op cit).

Brazil and Thailand were two important cases in point. They were both affected by the financial crisis and, collectively, they are key exporters of rice, coffee and marine products. The growth in their exports saw declines in the export prices of

Vietnam's three most important export commodities. For rice and coffee, the declines in export prices are evident in global standard commodity price indices, as shown in Figure 1. This adverse terms of trade change stalled Vietnam's growth and turned the policy spotlight back on its trade policy regime. There is little doubt that reductions in trade distortions will benefit Vietnam's economy in the long run, in the same way they have in other East and Southeast Asian economies (World Bank 1993). In the short run, however, reductions to import barriers tend to depreciate the real exchange rate and, depending on the monetary policy regime, there is the risk of domestic deflation. This, in turn, tends to raise real wages and to reduce employment growth. Moreover, tariff reductions reduce government revenue. If new taxes are not found increased government borrowing can crowd out private investment, further slowing growth.

The purpose of this paper is to examine the effects of trade policy reform in the short run and to focus, in particular, on the role of macroeconomic policy settings in influencing short run gains from expanded trade. To do this we use a comparative static global macroeconomic model, within which the microeconomic (supply) side is adapted from GTAP[1], a multi-region comparative static model in real variables with price-taking households and all industries comprising identical competitive firms. Following Yang and Tyers (2000), to this GTAP base is added independent representations of governments' fiscal regimes, with both direct and indirect taxation, as well as separate assets in each region (currency and bonds) and monetary policies with a range of different alternative targets. With this model it is possible to conduct trade liberalization and other experiments under alternative and explicit assumptions about macroeconomic policy regimes. Section 2 offers a description of the model used. Section 3 applies the model to the recent terms of trade shock and examines its short-term consequences. Section 4 then examines the short run effects of unilateral trade liberalization under a range of alternative macroeconomic policy regimes. A short summary and conclusions are offered in Section 5.

## 2. The Model

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[1] A detailed description of the original model is provided by Hertel (1997).

The microeconomic side of the model originates with GTAP, which offers the following useful properties: (1) a capital goods sector in each region to service investment, (2) explicit savings in each region, combined with open regional capital accounts that permit savings in one region to finance investment in others, (3) multiple trading regions, goods and primary factors, (4) product differentiation by country of origin, (5) empirically based differences in tastes and technology across regions, (6) non-homothetic preferences, and (7) explicit transportation costs and indirect taxes on trade, production and consumption. All individual goods and services entering final and intermediate demand are constant elasticity of substitution (CES) blends of home products and imports. In turn, imports are CES composites of the products of all regions the content of which depends on regional trading prices. Savings are pooled globally and investment is then allocated between regions from the global pool. Within regions, investment places demands on the domestic capital goods sector, which is also a CES composite of home-produced goods, services and imports in the manner of government spending. The regions, primary factors and sectors identified in the model are listed in Table 1. Skill is separated from raw labour on occupational grounds, with occupations in the "professional" categories of the International Labour Organisation (ILO) classification included as skilled.[2]

A key modification of the standard model code makes the government financially independent, and so enables more explicit treatment of fiscal policy. Direct taxes are incorporated at the observed average income tax rates for each region. Marginal tax rates are therefore assumed constant at $\tau$. Regional households then receive regional factor income, $Y_F$, and from this they pay direct tax $\tau Y_F$,. The disposable income that remains is then divided between private consumption and private saving. Government saving, or the government surplus, $S_G = T - G$, is then simply revenue from direct taxes, $\tau Y_F$, and indirect taxes, $T_I$, less government spending, $G$, which could be exogenous or fixed as a proportion of GDP.[3] Thus, $S_G = T_I + \tau Y_F - G$. The private saving and consumption decision is represented by a reduced form exponential consumption equation with wealth effects included via the dependence of consumption (and hence savings) on the interest rate. Each region then

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[2] See Liu et al. (1998) for the method adopted.
[3] $T_I$ includes revenue from taxes on production, consumption, factor use and trade, all of which are accounted for in the original GTAP model and database.

contributes its total domestic (private plus government) saving, $S_D = S_P + S_G$, to the global pool from which investment is derived.[4]

For each region, the above relations imply the balance of payments identity, which sets the current account surplus equal to the capital account deficit: $X - M = S_P + S_G - I$.[5] From the pool of global savings, investment is allocated across regions and it places demands on capital goods sectors in each region. In the short run considered, however, it does not add to the installed capital stock. Also at this length of run, nominal wages are sticky in some regions (the industrialised regions of the US, the EU, Canada and Australia, and those developing countries with heavily regulated labour markets, China and Vietnam) but flexible elsewhere. In the spirit of comparative statics, although price levels do change in response to shocks, agents represented in the model do not expect any continuous inflation and so there is no distinction between the real and nominal interest rates.

In allocating the global savings pool as investment across regions, we have opted for the most flexible approach, implying a high level of global "capital" mobility.[6] The allocation to region $j$ depends positively on the expected long run change in the average rate of return on installed capital, $r_j^e$, which, in turn, rises when the marginal product of physical capital is expected to increase. This allocation falls when the opportunity cost of financing capital expenditure, the region's real interest rate, $r_j$, rises. This rate depends, in turn, on a global capital market clearing interest rate, $r^w$, calculated such that global savings equals global investment : $\Sigma_j S_j^D = \Sigma_j I_j (r_j^e, r_j)$. Here $I_j$ is real investment in region $j$.[7] The region's home interest rate is then $r_j = r^w(1+\pi_j)$ where $\pi_j$ is a region-specific interest premium, thought to be driven by risk factors not incorporated in this analysis. The investment demand equation for region $j$ then takes the form:

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[4] Private saving is derived as the difference between disposable income ($Y$-$T$) and consumption expenditure, where real consumption is determined in a Keynesian reduced form equation that takes the form: $C = \gamma \ r^\delta \ [Y - T]^\mu$ , where $r$ is the real interest rate.

[5] Note that there is no allowance for interregional capital ownership in the starting equilibrium. At the outset, therefore, there are no factor service flows and the current account is the same as the balance of trade.

[6] By which it is meant that households can direct their savings to any region in the world without impediment. Installed capital, however, remains immobile even between sectors.

[7] Before adding to the global pool, savings in each region is deflated using the regional capital goods price index and then converted into US$ at the initial exchange rate. The global investment allocation process then is made in real volume terms.

$$(1) \quad \frac{K_j + I_j}{K_j} = \beta \left( \frac{r_j}{r_j^e} \right)^{-\varepsilon}$$

where $K_j$ is the (exogenous) base year installed capital stock, $\beta$ is a positive constant and $\varepsilon$ is a positive elasticity. Critically, investment in any region responds positively to changes that are expected to raise the sectoral average of a region's marginal product of physical capital and hence the regional average return on installed capital. Other things equal, then, improvements in trans-sectoral efficiency, such as might stem from a trade reform, are thought to raise capital returns permanently and hence they raise $r_j^e$. If such a shock also causes the rate of unemployment to fall this raises total labour use and hence the current return on installed physical capital. When the shock is a trade reform, such employment effects are also considered permanent and so they add positively to the expected future return on installed capital, $r_j^e$.

Investment decisions are assumed to be made by forward-looking agents with access to a long run version of the model. Thus, the expected change in the (long run) rate of return on installed capital in each region, $r_j^e$, is exogenous in short run simulations. It is calculated by first simulating the effects of the same shock but under long run closure assumptions. These differ from the short run closure in the following ways: 1) there are no nominal rigidities (no rigidity of nominal wages), 2) larger production and consumption elasticities are used to reflect the additional time for adjustment, 3) physical capital is no longer sector specific; it redistributes across sectors to equalise rates of return, 4) capital controls are ignored, and 5) in Vietnam any loss of government revenue associated with tariff changes is assumed to be made up via direct (income) tax; so that the ratios of government revenue and expenditure to GDP are exogenous while the average direct tax rate in Vietnam is made endogenous.

Note that our short run comparative static analysis does not require that the global economy be in a steady state. When shocks are imposed, the counterfactual return on installed capital, $r_j^e$, need not be the same as the corresponding opportunity cost of capital expenditure, $r_j$. Such shocks, implemented in the current period, change income and savings and, therefore, expected returns in directions that differ from corresponding short run changes in the global interest rate, particularly considering that physical capital is fixed in quantity and sectoral distribution in the short run. Even in long run simulations, the global distribution of physical capital at the outset does not equalise rates of return across regions and redistribution through the regional allocation of one year's global savings is insufficient to redress such imbalances.

To include the monetary sector in each region we introduce region-specific money and homogeneous nominal bonds. Even though there is no interregional ownership of installed capital in the initial database regional bonds are traded internationally, making it possible for savers in one region to finance investment in another.[8] Cash in advance constraints cause households to maintain portfolios including both bonds and non-yielding money and the resulting demand for real money balances has the usual reduced form dependence on GDP (transactions demand) and the interest rate. This is equated with the region's real money supply, where purchasing power is measured in terms of its GDP deflator, $P^Y$. Since all domestic transactions are assumed to use the home region's money, international transactions require currency exchange. For this purpose, a single nominal exchange rate, $E_j$, is defined for each region. A single key region is identified (here the US) relative to whose currency these nominal rates are defined. For the US, then, $E=1$ and $E_j$ is the number of US dollars per unit of region $j$'s currency. In essence, we are adding to the real model one new equation per region (the *LM* curve linking the real money supply to GDP and the interest rate) and one new (usually endogenous) variable per region, $E_j$.[9]

The bilateral rate between region $i$ and region $j$ is then simply the quotient of the two exchange rates with the US, $E_{ij} = E_i/E_j$. Quotients such as this appear in all international transactions. The most straightforward of the international transactions in the original model are trade transactions. There the bilateral exchange rate is simply included in all import price equations, along with *cif/fob* margins and trade taxes. In the case of savings and investment, the global pool of savings is accumulated in US dollars. Investment, once allocated to region $j$, is converted to that region's currency at the rate $E_j$ (US$ per unit of local currency). The third, and most cryptic, set of international transactions in the original model concerns international transport services. Payments associated with *cif/fob* margins are assumed to be made by the importer in US dollars. The global transport sector then demands inputs from each regional economy and these transactions are converted at the appropriate regional rates.

Without nominal rigidities the model always exhibits money neutrality, both at the regional and global levels. Firms in the model respond to changes in nominal product, input and factor prices but a real producer wage is calculated for labour as the quotient of the nominal wage and the GDP deflator, so that $w=W/P^Y$. Thus, money shocks always maintain

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[8] Since the initial database we use (GTAP Version 5) incorporates no "net income" or factor service component in its current account, our initial equilibria must do likewise. This implies the assumption that, although there are no interregional bond holdings initially, the shocks implemented cause interregional exchanges of bonds and hence a non-zero net income flow in future current accounts not represented.

[9] More precisely, since for the US $E=1$, we are adding one less (usually endogenous) variable. Where nominal exchange rates are to be endogenous and nominal money supplies exogenous, one additional variable must be made endogenous. We could, for example, balance this by making one price level exogenous, such as by having US monetary policy target the change in the US CPI, $P^C$.

constant *w* when nominal rigidities are absent. It is in the setting of the nominal wage, *W*, that we have introduced nominal rigidities to the model. A parameter, $\lambda \in (0,1)$ is inserted, such that

$$(2) \qquad \frac{W}{W_0} = \Lambda \left( \frac{P^Y}{P_0^Y} \right)^\lambda$$

where $W_0$ is the initial value of the nominal wage, $P_0^Y$ is the corresponding initial value of the GDP deflator and $\Lambda$ is a slack constant. When ever $\Lambda$ is exogenous and set a unity, the nominal wage carries this relationship to the price level and the labour market will not clear except in the unlikely event that equation (2) happens to yield a market clearing real wage. The case where the labour market is fully flexible is represented by setting $\Lambda$ as an endogenous slack variable and thereby rendering (2) ineffective. At the same time, labour demand is forced to equate with exogenous labour supply to reflect the clearing market.

The representation of capital controls:

The model assumes that savings are perfectly mobile between regions and that the allocation of investment between them depends on region-specific interest premia and, if they are present, capital controls. In the absence of capital controls a region's domestic capital market might be represented as in Figure 2. Net inflows on the capital account (*KA*), which comprise the net inflow of foreign savings, $S_{NF}$, less the net outflow associated with the accumulation of official foreign reserves, $\Delta R$, are perfectly elastic at the global interest rate (the latter being adjusted by the exogenous region-specific premium, $\pi$).[10] The actual scale of net inflows depends on the net demand for foreign investment, $NFI = I - S_D$, where the relationship between *NFI* and *r* is shifted to the right by an increase in the expected future return on installed capital, $r^e$, via equation (1), or by an increase in government spending, *G*, via its effect on domestic saving. It is shifted to the left by an increase in GDP (*Y*), via its effect on consumption and tax revenue and hence on domestic savings, $S_D$. In the figure, net inflows on the capital account are determined by the intersection of the two curves shown. For a balance of payments, these inflows must then equate to net outflows on

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[10] The scope of monetary policy includes alterations in the rate at which official foreign reserves are accumulated. When there are no capital controls, however, the perfect capital mobility assumption implies that changes in reserves have no effect on net capital account flows. Where they are important is in the case where capital controls are effective. Because the manipulation of reserves offers only a

the current account, *CA*, and prices, and therefore real exchange rates, adjust to ensure that this is the case. We represent capital controls by a rigid ceiling on net inflows on the capital account. The case is illustrated in Figure 3. In this circumstance the link between the home and global interest rates is severed unless net foreign investment falls sufficiently so that the controls cease to bind. In our simulations the interest premium, $\pi$, is made endogenous while net flows on the capital account, *KA*, or, equivalently, on the current account, *CA*, are set as exogenous.

Data and parameters:

Because the length of run is short, the real part of the short run model incorporates smaller-than-standard elasticities of substitution in both demand and supply. These are set smaller than the standard ones to an extent guided by a short run calibration exercise on the Asian crisis, described in Yang and Tyers (2000). For further details of the model, its parameters and its structure, see Yang and Tyers, *op cit*, and Tyers and Yang (2000, 2001).

## 3. Effects of the terms of trade shock:

The external changes discussed in Section 1, had the obvious effect of reducing national income and employment growth. But, for Vietnam, the changes are more serious because of her special trade structure and her macroeconomic policy. Rice, coffee and fish products are major exports and they are produced in sectors employing the bulk of the labor force. Rice, for example, is grown by nearly 80 per cent of farmers and more than a tenth is exported. It is the dominant agricultural contributor to Vietnam's exports. Coffee is the next largest contributor to Vietnam's exports and its farmers and processors are almost completely dependent on the export market. This means that declines in the export prices of these products have their most direct effects on rural incomes. The downturn in key rural product prices risks a reversal of the recent trend away from rural poverty, an acceleration in the demand for urban employment and a rise in the costs of urban congestion.

The tendency of Vietnamese monetary authorities to allow only small variations in the US dollar exchange rate implies that the exchange rate is a major

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short term approach to exchange rate management that is only available if reserves are sufficient in the

target for monetary policy.[11] A negative external shock like the terms of trade change results in a real depreciation. When monetary policy targets the nominal exchange rate, which then remains fixed or adjusts only partially, the home price level must fall relative to foreign prices. Unless foreign inflation is substantial, this requires a domestic deflation. There has, indeed, been such a deflation in Vietnam, with the CPI declining at a rate of between one and two per cent per year since the beginning of 2000.[12] Since nominal wages tend to change more sluggishly than other prices, particularly downward, this raises the trend of real wages and lowers the growth rate of employment.

The associated fall in the rate of urban employment growth and the rise in rural to urban migration, taken together, lead to greater unemployment and urban congestion. Without a reversal of the terms of trade shock, and one is not expected soon, the only way steady growth can be restored is through a change of policy that will restore the rate of growth of export revenue. The alternatives center on trade reform, though they range from unilateral tariff reductions through multilateral reforms of various types, including the ASEAN Free Trade Agreement and the US Bilateral Trade Agreement. We focus on unilateral liberalization, a considerable amount of which has already taken place in the years since the Asian crisis.

The focus of the simulation is on a short run in which the stock of physical capital is fixed and sectorally immobile. Investment makes demands on capital goods sectors but at this length of run it does not raise the productive capital stock. Also at this length of run, nominal wages are sticky downward in some regions (Vietnam, China, US, EU and Australia) but flexible elsewhere. For most regions, savings are mobile internationally and investment is allocated between countries to equate its expected rate of return net of exogenous risk premia. In Vietnam and China, however, capital controls are seen as maintaining constant net flows on the capital account of the balance of payments irrespective of any change in the global interest rate. For each region represented the closure assumptions concerning monetary

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first place, $\Delta R$ is held exogenous throughout the analysis in this paper.

[11] This is an interpretation of the macroeconomic data presented by the IMF (2001). It is not, however, in precise accord with the interpretation given by the IMF staff in the text of this document. The magnitude and distributional significance of the recent terms of trade change (Figure 1 in this paper) is not examined in that report.

[12] See Figure 1, P.27 of IMF (*op cit*). The point of disagreement with the interpretation given in the text of the IMF report is over its preoccupation with controlling inflation when recent external shocks, combined with monetary policy, have been significantly deflationary. For supporting evidence of the deflationary trend, see also Table 1 of Institute of Economics (2001).

policy, labour market clearance and capital account openness, are detailed in Table 2. In Vietnam, monetary policy is assumed to target the nominal exchange rate against the US dollar. In this one-year length of run, the labour market is not completely flexible (so that, as in reality, product prices adjust faster than do wages) and the capital account of the balance of payments is closed. The simulation results are summarised in Table 3.

The short run shock represented here is highly stylised. The global slowdown is represented only by a 5 per cent fall in the elasticity of consumption to income in the US. This reduces final demand in the US and its producer price level (GDP deflator) falls. The added savings reduce the global interest rate and US investment rises. There is also an outflow on the US capital account, however, though Vietnam's capital controls ensure that this does not result in an increased inflow there. The remainder of the terms of trade shock stems from productivity and consumption shocks in competing exports, particularly Thailand and Brazil and the associated surges in exports from these economies in the aftermath of the financial crisis. To represent this productivity and consumption shocks are administered that cause the Thai export price of rice to fall 10 per cent and the Brazilian export price of coffee to fall 20 per cent. These falls are smaller than those shown in Figure 1 but they represent a stylised annual change only. Recall that we are examining short run effects here in a macroeconomic context.

From Vietnam's perspective the terms of trade change is adverse, as indicated by the results presented in Table 3. It causes a real depreciation. This is true even though Vietnam is an exporter of petroleum and the rise in investment around the world associated with lower interest rates increases expenditure on capital goods, which are energy-intensive. There is therefore a rise in Vietnam's oil export price though one not sufficient in magnitude to offset the other export price falls. Given Vietnam's sticky wages, the deflation raises real wages and reduces output. Since the analysis is comparative static, we can think of this result as implying slower employment growth in a dynamic context. Aggregate output (GDP) falls (in a dynamic context it grows more slowly). To the extent that the terms of trade change is considered a long term phenomenon, the expected long run change in the average return on installed capital also falls in Vietnam and this reduces overall investment.

The real depreciation contracts the non-tradeable (mainly services) sectors more than the others. The key exceptions to this pattern are the sectors most directly affected by export price declines: rice, coffee and fisheries. Coffee and fisheries production contract the most. Rice production does not contract, despite the fall in its export price. This is because reduced overall income bolsters the expenditure share of staple foods and because, in this simulation at least, a small amount of land is reallocated out of coffee into other agricultural activities,

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including rice and "other crops".  Although no physical capital is mobile between sectors at this length of run, unskilled labour does move, as indicated in Table 4.  It migrates from coffee plantations and services into manufacturing, global demand for the products of which rises because of Vietnam's real depreciation.  Manufacturing production therefore rises and the light-manufacturing sector benefits the most.

Finally, the changes in factor incomes show that, even though there is not a wholesale contraction in output from the agricultural sector, income to land falls dramatically.  This is the driving force behind the migration into manufacturing that occurs in the simulation.  Clearly, if this migration is inhibited by Vietnam's labour registration system and by capital controls that constrain investment in light manufacturing, the needed expansion of manufacturing exports would be choked off and employment growth would slow by more than the small amount shown.  Recent research by Thang (2001) suggests that, while the mobility of workers between sectors is increasing through time in Vietnam, sufficient barriers remain.  The above results may therefore err on the optimistic side.

## 4. The short run effects of unilateral trade liberalization

The 2001 pattern of trade and production taxes and subsidies is constructed first from the GTAP Version V global database for 1997, adjusted to include the effects of some non-tariff barriers noted by the CIE (1999).  Recent updates to the tariff regime are as provided by Thang (2002).  Changes in the associated policy detail are reviewed by the Institute of Economics (2001).  Of particular importance is the introduction since 1997 of duty drawbacks that are offered to exporting firms on the component of their imports of intermediate goods that is used for export production.  The effects of these duty drawbacks are particularly difficult to quantify since it is generally impossible to separate out production for export from production for the domestic market.[13]

For the analysis to be conducted here, the effects of duty drawbacks are approximated by, first, constructing a database comprising inter-industry financial flows after the general tariff reforms for the period 1997-2001.  This database emerges from a model simulation in which the only shocks are the documented changes in tariffs by sector.  The pattern of these inter-industry flows indicates the magnitude of the expenditures on intermediate inputs and on import tariffs by firms in each industry and the proportions of their respective outputs that are exported.  Second, the proportions of expenditures on imported (as distinct from home-

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[13] Bach et al. (1996) offer one approximation that requires the construction of a set of equivalent production taxes and subsidies and the rebalancing of the economic database to reflect these. Walmsley et al. (2001) reconstruct their global database to separate out production for exports and domestic sales.  An investment of this magnitude is too great for the purpose of this report.

produced) intermediate inputs are derived, along with the average proportions of these that enter export production. Expenditures on tariffs for export production follow for each industry. Finally, this sum is then returned through the implementation of equivalent export subsidies (or reduced export taxes).

The application offered here is one in which the manufacturing sector, to which duty drawbacks primarily apply, is aggregated into only "light manufacturing" and "other manufacturing". At this level of aggregation there is a considerable volume of intra-industry trade. To a large extent, manufacturing exports use (mostly light) manufacturing intermediate inputs that are imported. In these circumstances, the use of export subsidies to proxy duty drawbacks is crude but it offers the following realistic consequences:

1) The export industry expands in response to its greater profitability.

2) The price of the industry's product rises in the home market. Although this effect is not realistic in itself, it has the realistic consequence that there is substitution in favour of imports in intermediate consumption and so the home market share in intermediate inputs falls.

3) The government is denied the revenue that would have come from the tariffs on intermediates used for export production, in this case by giving it back in the form of export subsidies.

The 2001 export tax rates used are modified by to take account of the ad valorem equivalent export subsidy rates that are proxies for duty drawbacks. The resulting pattern of equivalent trade taxes and subsidies is listed in Table 5. Coffee, "other crops", processed food, fishing and manufacturing have received significant border protection, though at rates that diminished substantially between 1997 and 2001. Moreover, food processing, which is the sector through which most agricultural products flow, still receives considerable protection. Since, in the Vietnamese input-output table for 1996, on which the inter-industry flows in the model are based, food processing is primarily rice milling, this protection advantages the rice sector as a whole.[14] Indeed, the rice sector also receives tariff protection from import competition. The pattern of protection that advantages agriculture at the expense of other tradable goods sectors contrasts with that in most other developing countries at similar levels of income per capita, wherein the agricultural sector is net taxed (Krueger 1992).[15]

Here the focus is again on the short run. All simulations commence with the Vietnam economy following the adverse the 1997-2001 reforms and the terms of trade shock discussed in Section 1. The further reform examined is a unilateral liberalization of all Vietnam's

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[14] A great deal of diversification has occurred in the Vietnamese food-processing sector since the mid-1990s and this characterisation would now be inaccurate.

[15] The net effects of the protection regime in the long run are discussed in Tyers (2002).

import tariffs and export taxes. Because these reforms are considered here in the short run only, the sizes of the shocks are reduced to 20%, to represent a realistic change for any given year. We seek to estimate the change that would be due to the trade reform alone, taking as the starting point the Vietnamese economy of 2001, following the terms of trade shock and the liberalizations of the period 1997-2001. To assess the role of the macroeconomic policy environment, however, the liberalization experiment is carried out under eight different policy combinations that depend on whether (a) monetary policy targets the nominal exchange rate or the consumer price level, (b) fiscal policy adjusts to reduced tariff revenue by either raising the deficit or making up the lost revenue through a rise in the income tax rate, and (c) whether tight capital controls persist or are relaxed.

In the long run, when no nominal rigidities persist and capital can be reallocated sectorally, this trade liberalization yields the anticipated gains from expanded trade. Although the trade policy regime of 2001 advantages food processing, agriculture, fisheries and light manufacturing it is the latter sector that is the robust beneficiary of unilateral trade liberalisation. Before turning to the differences wrought by the alternative macroeconomic policy regimes, it is useful to examine the reasons for what will prove to be the surprising magnitude and robustness of this result. It depends importantly on subtle qualities of Vietnam's manufacturing sector in reality and as it is represented in the model. The first of these is its pattern of factor intensities. For all the sectors defined in the model, sets of factor proportions are displayed in Table 6. They show, as expected, that agricultural industries are land intensive, with coffee and "other crops" being more intensive in capital than the other crops. Fishing is capital and natural resource intensive and the energy sector is very capital intensive. Of special relevance in interpreting the effects of unilateral liberalisation, however, are the factor intensities for manufacturing. Note that light manufacturing is the most labour intensive of all the traded goods sectors while heavy, or "other", manufacturing, is, along with transport, the most capital intensive.

The second subtlety is that, when manufacturing is aggregated into two types, as in this case, the two sub-industries disguise considerable heterogeneity. One consequence of this is that there is considerable intra-industry trade. Light manufacturing is the most export-oriented of all the sectors - its exports are largest compared with its domestic value added. Heavy manufacturing, on the other hand, is distinctive by the considerable scale of its competing imports. While intra-industry trade is significant in the food-processing sector nowhere is it more important than in light manufacturing. This is clear from Table 7. And the final subtlety is that a considerable proportion of the intra-industry trade in light

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manufacturing is in intermediate inputs. As is evident from Table 8, both manufacturing sectors commit half their total costs to inputs in the same product category and a third of those total costs is committed to imported inputs in that category.

Superficially, trade liberalisation removes the sector's tariff protection and so our intuition, stemming from the standard Heckscher-Ohlin-Samuelson (HOS) trade model, suggests it must contract. But here we have two departures from the (HOS) model. First, we have extensive intermediate use from the same sector and, second, competing imports, even though they are from the same sector, are differentiated from home products. Under these conditions the tariff reductions on imported intermediates have a direct effect on home industry total cost. Reduced tariffs on competing, but differentiated, imports has only an indirect effect the magnitude of which depends on the elasticity of substitution between the two. It turns out that the input cost effect of tariff reductions is considerably greater than that of the loss of protection against competing imports. There is therefore a considerable expansion in light manufacturing output and employment. The resulting rise in labour demand pushes up the real wage of unskilled workers. In the short run the tendency for light manufacturing to expand is further enhanced by the combined effect of nominal wage stickiness and monetary policy in restraining the real wage rise and hence in raising the level of employment. A comparatively labour-intensive sector, light manufacturing attracts this new labour, bolstering its expansion.

The short run macroeconomics:

The broad behaviour of the model can be represented as in Figure 4. The upper diagram represents the domestic capital market and the lower one the domestic market for foreign products. These markets are linked by the requirement that, for a balance of payments, net flows on the capital account must mirror those on the current account. Net demand for foreign products (the downward sloping line in the lower diagram, $NM=M\text{-}X$) depends on the relative price of foreign goods. For this purpose define the real exchange rate as

$$(3) \qquad e_R = E\frac{P^Y}{P*} = \frac{P^Y}{P*/E}$$

where, as before, $E$ is the nominal exchange rate in foreign currency per unit of home currency, $P^Y$ is the GDP deflator and $P*$ is the foreign price level. In the numerical model we estimate a real effective exchange rate as the trade-weighted average of the ratio of the home and the foreign GDP deflators. Note that this is simply the common currency ratio of the

home to the foreign product price. Net imports depend positively on this and negatively on its inverse – the common-currency foreign to home product price ratio. This relationship is shifted to the right by an increase in GDP, $Y$, or a reduction in protection, $\tau$. The real exchange rate is then determined by the balance of payments requirement that net inflows on the capital account must equal net outflows on the current account, $KA=-CA=NM=M-X$.[16]

Consider, first, the case in which tight capital controls are retained. The trade liberalisation reduces $\tau$ and shifts $NM$ to the right. With tight capital controls, the current account balance cannot change. The shock therefore raises the relative price of foreign goods in the home market and thus depreciates the real exchange rate. If the nominal exchange rate is fixed as the target of monetary policy and the home economy is small by comparison with its trading partners (as Vietnam is) then, from (3) a fall in $P^Y$ (a deflation) is required. This must be brought about by a monetary contraction in defence of the exchange rate. To the extent that wages adjust more sluggishly than product prices, the deflation causes the real wage to rise. Were the real depreciation the only consequence of the liberalisation shock its effects would therefore be contractionary. Fortunately, this is not the case and, to see it, we need a multi-product general equilibrium framework like the model used here. The liberalisation is seen to improve allocative efficiency to such an extent that GDP rises in spite of the increased real wage. In Figure 4 this reinforces the rightward shift in the $NM$ curve and the resulting real depreciation. But the increased efficiency also raises the long run return on installed capital and this raises investment demand, shifting the $NFI$ curve in the upper diagram to the right. This rightward shift dominates an opposing one due to higher income and therefore higher domestic savings. The effect is a rise in the domestic interest rate relative to that abroad and a consequent fall in investment.

Now suppose that the monetary policy regime targeted the consumer price level instead of the nominal exchange rate. This takes the form of a weighted average of the prices of home and foreign goods in the domestic market:

$$(4) \qquad \bar{P}^C = Av\left\{ P^Y, \frac{P*}{E} \right\} .$$

The floating exchange rate then depreciates, raising the home price of foreign goods. This necessitates that there be a fall in $P^Y$ (a deflation), but, this time, it is smaller than before since adjustment to the real depreciation is shared between the exchange rate and the domestic GDP deflator (via equation 3). The consequence of the exchange rate flexibility is a smaller deflation and hence a smaller real wage increase and a larger net gain from the liberalisation.

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[16] We ignore the net income component of the current account.

In the capital market (upper) part of the diagram this means the GDP-driven tendency of the *NFI* curve to shift left is larger and the net rightward shift smaller, so that the fall in investment is reduced. If it can be managed, therefore, exchange rate flexibility is superior to a fixed rate regime where capital controls are tight.

If the capital controls are removed, the corresponding liberalisation shock is as depicted in Figure 5. Here reduced protection also yields a gain in allocative efficiency and hence a rise in GDP, reinforcing the rightward shift in the net imports curve. In this case, however, the absence of capital controls allows investment to flow in, responding to the increase in the expected long run return on installed capital. The increased inflow on the capital account relaxes the balance of payments constraint in the lower diagram and allows a substantial increase in net imports. The relative abundance of foreign goods on the domestic market rises, so that their relative price falls, and hence the real exchange rate appreciates. With a real appreciation on the left side of (3), the result is either a nominal appreciation or a domestic inflation, or both, depending on the target of monetary policy. If the nominal exchange rate is fixed, the domestic ($P^Y$) inflation is larger. With sticky nominal wages, this causes a larger reduction in the real wage and hence a larger expansion in employment and GDP. The fixed rate regime therefore gives a better short run outcome when capital controls are relaxed because then there is a larger (unanticipated) inflation and greater employment growth.

This general pattern is borne out in the simulation results in Table 9. With tight capital controls the gains in GDP and employment are larger when the nominal exchange rate floats. Indeed, in the floating rate regime, when monetary policy targets the consumer price level, $P^C$, the GDP deflator, $P^Y$, must fall and so the production real wage still rises, reducing employment growth. The superiority of the floating rate regime would have seemed even stronger had the target of monetary policy been set, instead, at $P^Y$. In sum, then, when capital controls are weak or nonexistent, the trade liberalisation is seen to attract increased inflows on the capital account and hence to reverse the effects on the real exchange rate and investment. Now both rise rather than falling as they did in the presence of tight capital controls. The boost to aggregate demand further raises employment and output.[17]

Fiscal policies:

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[17] The trade reform is a positive shock and so it should not be surprising that an open capital account is advantageous in its wake. Such openness would, however, risk outflows following negative shocks and it is this risk that justifies the controls in the first place. If the risk of capital flight is to be minimised, controls on the composition of investment may be required. These simulation results simply confirm that such controls should do as little as possible to inhibit the inflow of investment following positive shocks.

The fiscal impact of the trade reform comes through the associated decline in tariff revenue. Only two alternative fiscal policies are considered. The first has no tax revenue switch. Government spending continues at a constant share of GDP and all rates of direct and indirect tax are held constant except tariffs, which are reduced by the shock. The result of the trade liberalisation is therefore an expanded fiscal deficit. This is the fiscal policy applying in the simulations reported in Table 9. The alternative has the lost revenue made up via an increase in the direct tax rate, so that the fiscal deficit, government revenue and government spending are all maintained as constant proportions of GDP. The two fiscal policy responses are compared in Table 10.

As with monetary policies, the ranking assigned to the two depends on the strength of capital controls. In the presence of tight capital controls (that keep net flows on the capital account constant) policy 2 outperforms policy 1 in terms of GDP expansion. This is because the expanded fiscal deficit under policy 1 adds to the demand side of the domestic capital market, pushing up the domestic interest rate and crowding out private investment. Indeed, the home interest rate rises by more than the expected long run return on installed capital and so the volume of investment falls. Under policy 2, the rise in income taxation reduces pressure on the domestic capital market so that the rise in the home interest rate is less than that in the expected long run return on installed capital. The real volume of investment therefore rises in this case and this adds sufficiently to aggregate demand that GDP expands by more than under policy 1.

In the absence of effective capital controls the ranking is reversed: policy 1 outperforms policy 2. This is because net inflows on the capital account are now perfectly elastic at the international interest rate (plus an exogenous country risk premium). The added government borrowing therefore draws in additional saving from abroad and does not crowd out new private investment in the short run. Net inflows on the capital account, and domestic investment, increase substantially, the more so under policy 1. These new inflows finance substantially more net imports of foreign goods and therefore cause their domestic price to fall relative to home goods. This appreciates the real exchange rate, again by more when additional government borrowing bolsters the net inflows. Under the fixed exchange rate regime, for reasons discussed above, the real appreciation must be matched by a domestic inflation. And, while ever wages adjust more slowly than product prices, this reduces real wages and accelerates employment and GDP growth.

## 5. Conclusion

Experiments using a global multi-product comparative static macroeconomic model indicate that unilateral trade liberalisation not only yields the well known net gains in the long run but also short run gains are directionally robust to the macroeconomic policy regime. The magnitudes of these short run gains are, however, quite sensitive to the particular monetary and fiscal policies adopted. When capital controls are tight, a monetary policy that targets the domestic price level outperforms one that targets the nominal exchange rate. In this case, more short run expansion is achieved if lost tariff revenue is made up through an increased direct tax rate, rather than left to expand the fiscal deficit. When capital controls are ineffective, however, the fixed exchange rate regime is superior to a floating one in the short run, as is the larger fiscal deficit achieved by avoiding any tax switch.

# Figure 1: Trends in world rice and coffee prices
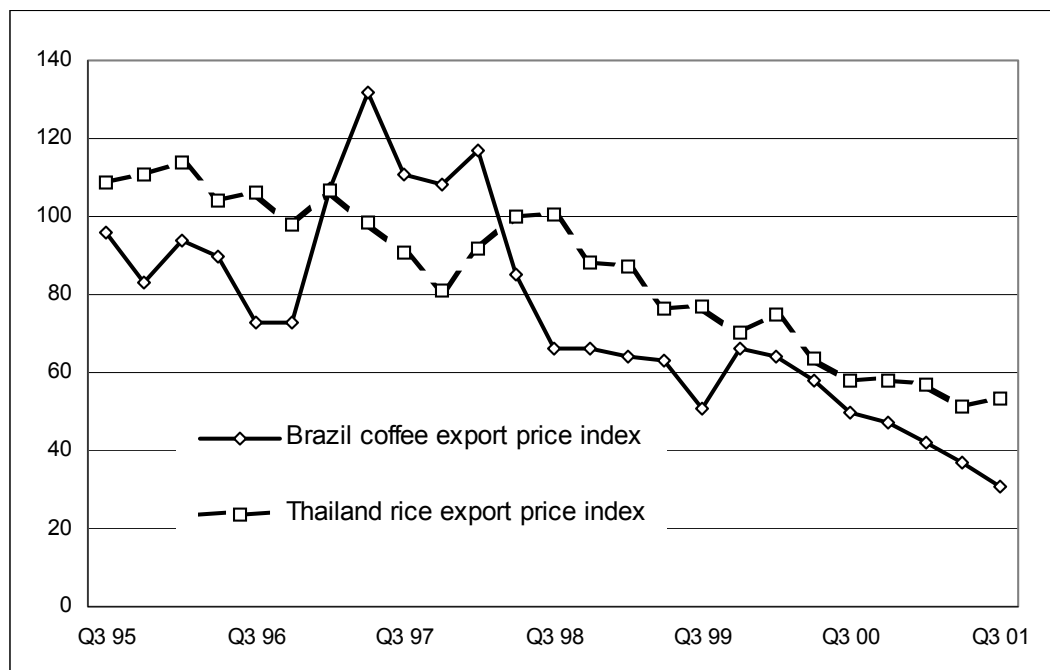


Source: IMF: International Financial Statistics, Commodity Price Indices (Codes BRI76EBDF, THI76N.DF)

$r$

$S_{NF} - \Delta R$

$KA(\Delta R) =$

$r_0 = r^w(1+\pi_0)$

$NFI(r^e,Y,G)$
$= I(r^e) - S_D(Y,G)$

$KA-$
$KA+$

$0$

$KA_0$
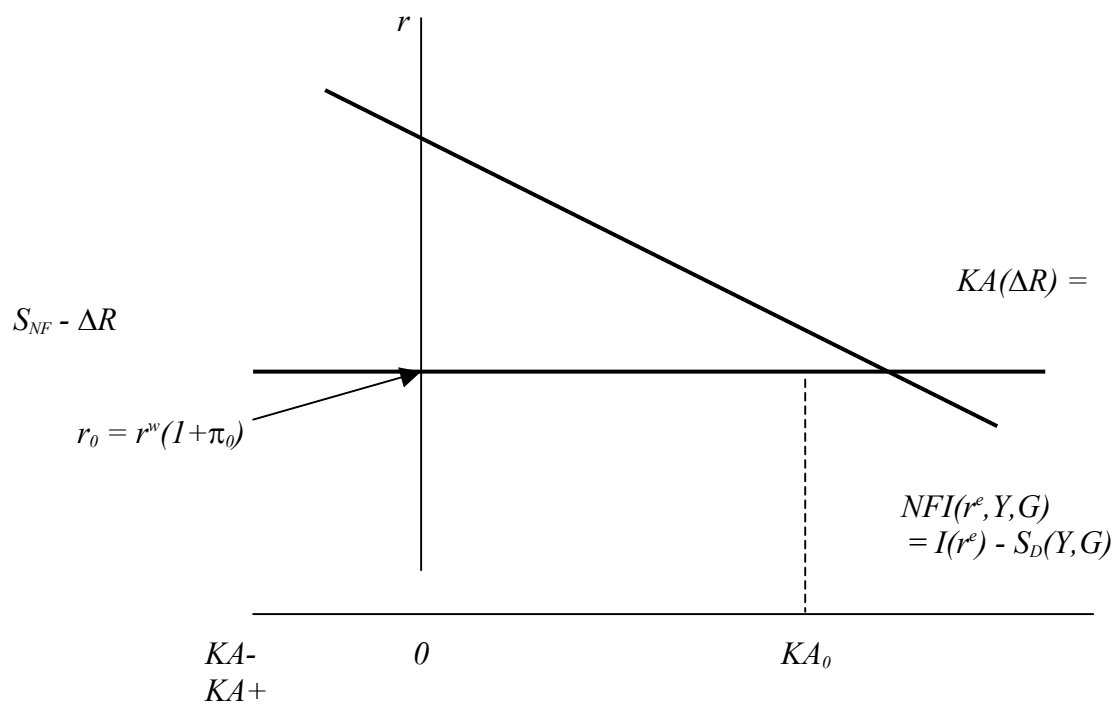
**Figure 2: The domestic capital market without capital controls**



$r$

$KA(\Delta R) = S_{NF} - \Delta R$

$r_0 = r^w(1+\pi_0)$

$r_w$

$NFI(r^e,Y,G)$
$= I(r^e) - S_D(Y,G)$

$KA-$

$0$

$KA_0$

$KA(\pi=0)$

$KA+$
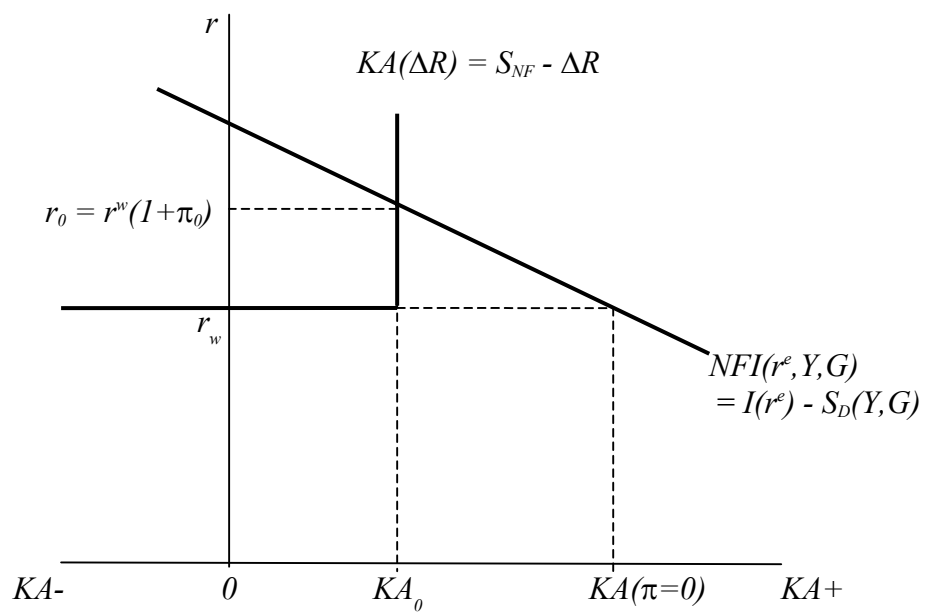
**Figure 3: The domestic capital market with capital controls**
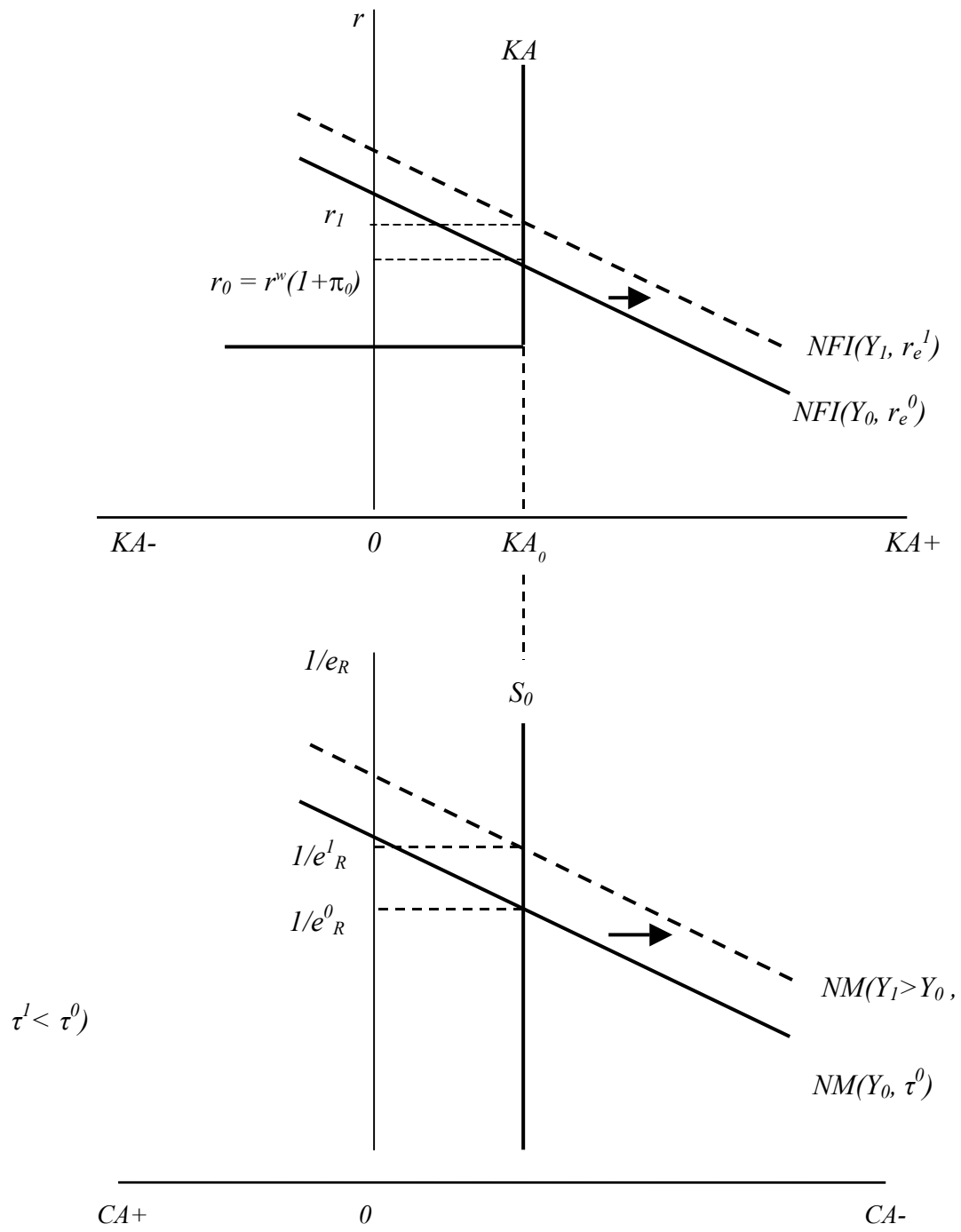
**Figure 4: Trade reform with capital controls**

r

$$r_0 = r^w(1+\pi_0)$$

KA

$NFI(Y_1, r_e^1)$

$NFI(Y_0, r_e^0)$

KA-    0    $KA_0$    $KA_1$

KA+

$1/e_R$

$S_0$    $S_1$

$1/e^0_R$
$1/e^1_R$

$NM(Y_1 > Y_0$ ,

$\tau^1 < \tau^0)$

$NM(Y_0, \tau^0)$

CA+        0                        CA-
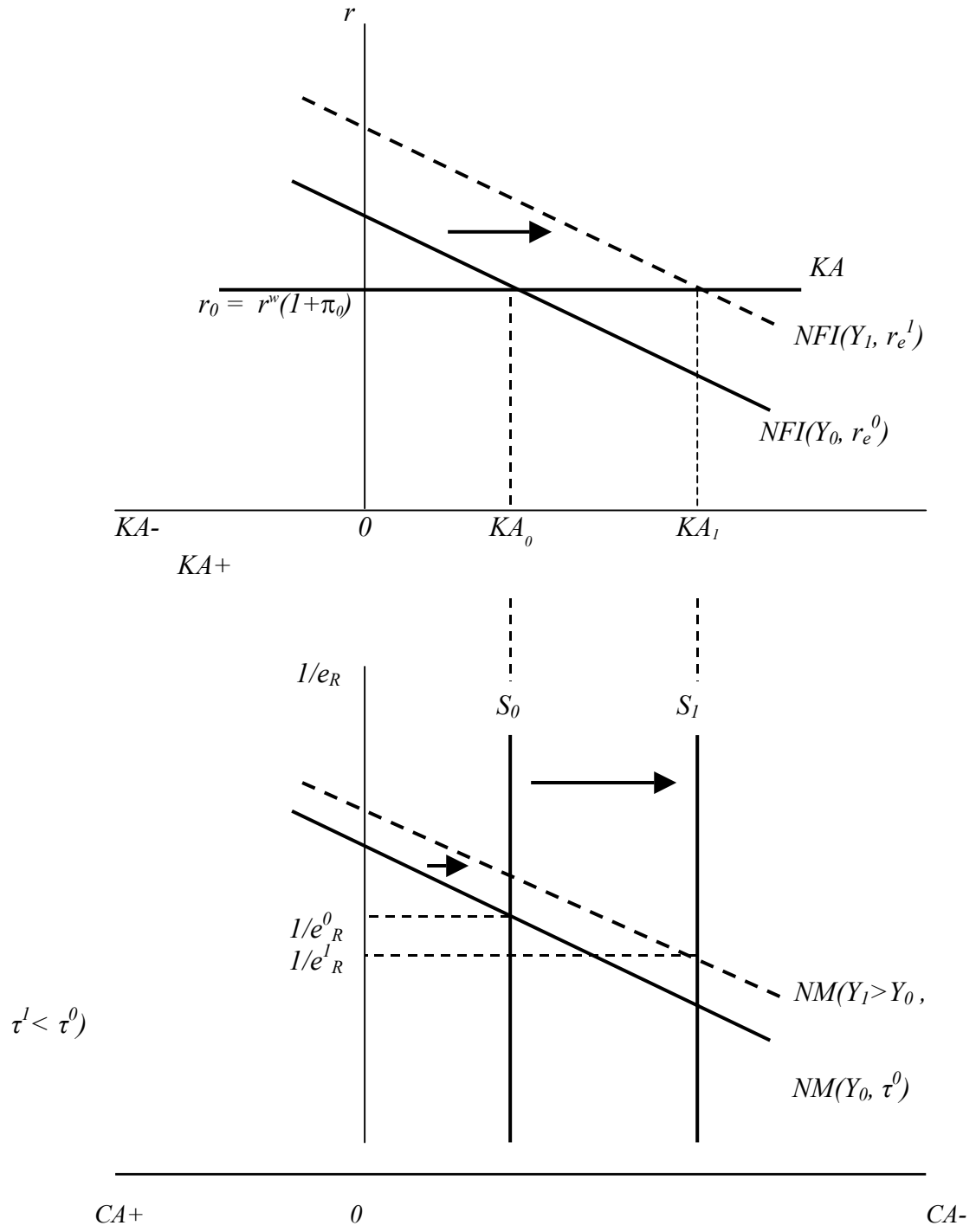
**Figure 5: Trade reform with no capital controls**

**Table 1:  Model structure**

**Regions**

1. Vietnam
2. Other ASEAN
3. China, including Hong Kong and Taiwan
4. Japan
5. Korea
6. Australia
7. United States
8. European Union[a]
9. Rest of World

**Primary factors**

1. Agricultural land
2. Natural resources
3. Skill
4. Labour
5. Physical capital

**Sectors**[b]

1. Paddy rice
2. Other Coffee (product 8 OCR, "crops nec")
3. Other crops (wheat, other cereal grains, vegetables, fruits, nuts, oil seeds, sugar cane and sugar beet, plant based fibres and forestry)
4. Livestock products (cattle, sheep, goats, horses, wool, silk-worm cocoons, raw milk, other animal products)
5. Fish (marine products)
6. Energy (coal, oil, gas)
7. Minerals
8. Processed food (meat of cattle, sheep, goats and horses, other meat products, vegetable oils and fats, dairy products, processed rice, processed sugar, processed beverages and tobacco products)
9. Light manufacturing (textiles, wearing apparel, leather products and wood products)
10. Other manufacturing (paper products and publishing, petroleum and coal products, chemicals, rubber and plastic products, other mineral products, ferrous metals, other metals, metal products, motor vehicles and parts, other transport equipment, electronic equipment, other machinery and equipment, other manufactures)
11. Transport (sea transport, air transport and other transport)
12. Infrastructure services (electricity, gas manufacturing and distribution, and water)
13. Construction and dwellings
14. Other services (retail and wholesale trade, communications, insurance, other financial services, other business services, recreation, other private services, public administration, defence, health and education)

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a    The European Union of 15.
b    These are aggregates of the 57 sector GTAP Version 5 database.

# Table 2: Terms of trade shock short run closure[a]

| Region | Monetary policy target[b] | Labour market closure: nominal wage[c] | Capital controls: capital account net inflow $I\text{-}S_D$ [d] |
|---|---|---|---|
| China | Nominal exchange rate, $E$ | Sticky (App 3 $\lambda=0.5$) | Rigid |
| Japan | Consumer price level, $P^C$ | Flexible (App 3 $\lambda=1$) | Flexible |
| Vietnam | Nominal exchange rate, $E$ | Sticky (App 3 $\lambda=0.5$) | Rigid |
| Other ASEAN | Consumer price level, $P^C$ | Flexible (App 3 $\lambda=1$) | Flexible |
| Korea | Consumer price level, $P^C$ | Flexible (App 3 $\lambda=1$) | Flexible |
| Australia | Consumer price level, $P^C$ | Rigid (App 3 $\lambda=0$) | Flexible |
| United States | Consumer price level, $P^C$ | Rigid (App 3 $\lambda=0$) | Flexible |
| Europe (EU) | Consumer price level, $P^C$ | Rigid (App 3 $\lambda=0$) | Flexible |
| Rest of World | Nominal exchange rate, $E$ | Flexible (App 3 $\lambda=1$) | Flexible |

a  The expected future return on installed capital is exogenous and determined in a separate long run solution.

b  The nominal money supply is endogenous in each case, the corresponding exogenous variable being the listed target.

c  When the nominal wage is assumed flexible it is endogenous and the corresponding exogenous variable is the employment level. When it is sticky or rigid, equation 2 of Section 2 is activated and the employment level is endogenous.

d  Capital controls are assumed to maintain a rigid net inflow of foreign investment on the capital account. When $KA = I\text{-}S_D$ is made exogenous to represent this, an interest premium opens between the domestic and international capital markets. This premium becomes endogenous. Effectively, the home and foreign capital markets are separated and clear at different interest rates. Where the capital account is flexible (open), this implies that private flows on the capital account are permitted at any level. $KA = I\text{-}S_D$ is then endogenous and the home interest premium is exogenous (unchanged by any shock). This means that the home interest rate then moves in proportion to the rate that clears the global savings-investment market.

## Table 3: Simulated *short run* effects on Vietnam's economy of the negative terms of trade shock[a]

| | Form of change | Change[b] |
|---|---|---|
| Nominal exchange rate (US$/•), $E_i$ | (%) | **0.00** |
| Domestic CPI, $P^C$ | (%) | -0.41 |
| | | |
| Domestic GDP deflator, $P^Y$ | (%) | -1.17 |
| Nominal Money supply, $M_S$ | (%) | -1.44 |
| Price of capital goods, $P^K$ | (%) | -0.13 |
| | | |
| Real effective exchange rate, $e_i^R$ | (%) | -2.79 |
| Real exchange rate against USA, $e_{ij}^R$ | (%) | -1.11 |
| Terms of trade | (%) | -1.21 |
| Export price of rice | (%) | -2.00 |
| Export price of coffee | (%) | -4.15 |
| Export price of energy | (%) | 3.79 |
| Export price of fish | (%) | -3.79 |
| Import price index | (%) | 1.71 |
| | | |
| Global interest rate, $r^w$ | | -0.73 |
| Investment premium factor, $(1+\pi)$ | (%) | 1.02 |
| Home interest rate, $r$ | (%) | 0.28 |
| Expected (long run) return on capital, $r^e$ | (%) | **-0.55** |
| Current return on installed capital, $r^c$ | (%) | -2.30 |
| | | |
| Real domestic investment, $I$ | (%) | -0.77 |
| Real consumption, $C$ | (%) | -1.64 |
| Balance of trade, $X\text{-}M = -KA = -(I\text{-}S_D)$ | (US$m) | **0.00** |
| | | |
| *Real gross sectoral output* | (%) | |
| Rice | | 0.14 |
| Coffee | | -4.74 |
| Other crops | | 0.57 |
| Livestock | | 0.29 |
| Food | | 0.39 |
| Fish | | -1.01 |
| Minerals | | -0.04 |
| Energy | | 0.17 |
| Light manufacturing | | 1.83 |
| Heavy manufacturing | | 0.87 |
| Transport | | 0.47 |
| Infrastructure services | | -0.41 |
| Construction and dwellings | | -0.89 |
| Other services | | -0.49 |
| Real GDP, $Y$ | (%) | -0.49 |
| | | |
| *Unskilled wage and employment* | | |
| Nominal (unskilled) wage, $W$ | (%) | -0.20 |
| Production real wage, $w=W/P^Y$ | (%) | 0.98 |
| Employment, $L^D$ | (%) | -1.17 |
| | | |
| *Unit factor rewards CPI deflated* | (%) | |
| Land | | -8.55 |
| Unskilled Labour (those employed) | | 0.21 |
| Skilled Labour | | -0.13 |
| Capital | | -1.43 |
| Natural Resources | | 2.15 |

a  The closure assumptions are as specified in Table 2.
b  The numbers in bold represent exogenous variables.

Source: Model simulation described in the text.

## Table 4: Simulated *short run* movements of unskilled workers in response to the negative terms of trade shock

|  | % Change[a] |
|---|---|
| *% Change in unskilled employment* | |
| Rice | -0.76 |
| Coffee | -7.18 |
| Other crops | 0.09 |
| Livestock | -0.59 |
| Food | 0.70 |
| Fish | -2.46 |
| Minerals | -0.14 |
| Energy | 1.83 |
| Light manufacturing | 2.78 |
| Heavy manufacturing | 1.82 |
| Transport | 1.00 |
| Infrastructure services | -0.76 |
| Construction and dwellings | -3.46 |
| Other services | -1.11 |
| Economy-wide | -1.17 |

Source: Model discussed in the simulation text.

## Table 5: Equivalent import tariff and export tax rates, 2001[a]

|  | Import tariff, % | Export tax[b], % |
|---|---|---|
| Rice | 15 | 15 |
| Coffee | 1 | 2 |
| Other crops | 6 | 3 |
| Livestock | 3 | 0 |
| Food | 20 | 1 |
| Fish | 22 | 7 |
| Minerals | 2 | -3 |
| Energy | 2 | 1 |
| Light manufacturing | 20 | 1 |
| Heavy manufacturing | 11 | -3 |
| Transport | 0 | -6 |
| Infrastructure services | 0 | -3 |
| Construction | 0 | -1 |
| Other services | 0 | -1 |

a  All tariff and tax equivalents are ad valorem.  They are intended to encompass both tariff and non-tariff barriers, though the accounting for non-tariff barriers is incomplete.
b  Negative export taxes rates indicate export subsidies.  These incorporate the export subsidy equivalents of the duty drawbacks available on imported inputs by exporting firms, calculated as explained in the text.

Sources: The 1997 numbers are aggregated from the 57 commodity categories in the GTAP Version 5 global database, 2000.

## Table 6: Factor intensities by industry[a]

|  | Land | Skilled labour | Unskilled labour | Physical capital | Natural resources |
|---|---|---|---|---|---|
| Rice | 50 | 0 | 43 | 7 | 0 |
| Coffee | 31 | 5 | 48 | 16 | 0 |
| Other crops | 33 | 0 | 33 | 30 | 4 |
| Livestock | 50 | 0 | 42 | 7 | 0 |
| Food processing | 0 | 9 | 52 | 39 | 0 |
| Fish | 0 | 0 | 41 | 20 | 39 |
| Minerals | 0 | 4 | 27 | 30 | 40 |
| Energy | 0 | 1 | 9 | 52 | 38 |
| Light manufacturing | 0 | 7 | 63 | 29 | 0 |
| Heavy manufacturing | 0 | 8 | 45 | 47 | 0 |
| Transport | 0 | 9 | 43 | 48 | 0 |
| Infrastructure services | 0 | 25 | 50 | 25 | 0 |
| Construction | 0 | 2 | 25 | 73 | 0 |
| Other services | 0 | 29 | 37 | 34 | 0 |

a  These are factor shares of total value added in each industry, calculated from the 2001 database following the 1997-2001 trade reforms.
Source: The GTAP Version 5 Database, as modified by simulations described in the text.


## Table 7: Trade to value added ratios by industry[a]

|  | Exports to value added ratio | Competing imports to value added ratio |
|---|---|---|
| Rice | 0.05 | 0.00 |
| Coffee | 1.88 | 0.27 |
| Other crops | 0.19 | 0.13 |
| Livestock | 0.16 | 0.05 |
| Food processing | 1.58 | 1.76 |
| Fish | 0.14 | 0.01 |
| Minerals | 0.29 | 0.19 |
| Energy | 1.25 | 0.00 |
| Light manufacturing | 5.29 | 2.89 |
| Heavy manufacturing | 1.42 | 9.28 |
| Transport | 0.84 | 0.66 |
| Infrastructure services | 0.00 | 0.00 |
| Construction | 0.01 | 0.00 |
| Other services | 0.13 | 0.14 |

a  These are quotients of the value of exports or imports at world prices and domestic value added in each industry.  They are from the 2001 global database (following the trade reforms of 1997-2001).
Source: The GTAP Version 5 Database, as modified by simulations described in the text.


## Table 8: Manufactured inputs as shares of the total cost of production[a]

|  | Light mfg inputs as a share of prodn cost | | | Heavy mfg inputs as a share of prodn cost | | |
|---|---|---|---|---|---|---|
|  | Total | Domestic | Imported | Total | Domestic | Imported |
| Light mfg | 49 | 12 | 38 | 17 | 5 | 12 |
| Heavy mfg | 3 | 2 | 2 | 47 | 15 | 32 |

a  These are input shares of total value added in each industry, calculated from the 2001 database following the 1997-2001 trade reforms.
Source: The GTAP Version 5 Database, as modified by simulations described in the text.

# Table 9: Simulated *short run* effects of a *unilateral* 20% liberalization of Vietnam's 2001 trade policy regime regime: monetary policy

| Change in: | Form of change | Fiscal policy 1: increase deficit[a] | | | |
|---|---|---|---|---|---|
| | | Retaining capital controls, monetary policy targets $E$[b] | Removing capital controls, monetary policy targets $E$ | Retaining capital controls, monetary policy targets $P^C$[c] | Removing capital controls, monetary policy targets $P^C$ |
| Nominal exchange rate (US$/•), $E_i$ | (%) | **0.00** | **0.00** | -1.27 | 1.49 |
| Domestic CPI, $P^C$ | (%) | -1.08 | 1.10 | **0.00** | **0.00** |
| Domestic GDP deflator, $P^Y$ | (%) | -1.70 | 1.30 | -0.75 | 0.39 |
| Nominal Money supply, $M_S$ | (%) | -1.86 | 2.08 | -0.80 | 1.09 |
| Export price of rice | (%) | -2.96 | -1.75 | -1.78 | -3.02 |
| Export price of coffee | (%) | -0.33 | 0.34 | 0.85 | -0.97 |
| Export price of energy | (%) | -0.01 | 0.22 | 1.30 | -1.25 |
| Export price of fish | (%) | -0.83 | 0.70 | 0.34 | -0.55 |
| Import price index | (%) | 0.00 | 0.01 | 1.29 | -1.46 |
| Price of capital goods, $P^K$ | (%) | -1.38 | 1.70 | -0.35 | 0.71 |
| | | | | | |
| Terms of trade | (%) | -0.91 | -0.33 | -1.04 | -0.14 |
| Real effective exchange rate, $e_i^R$ | (%) | -1.70 | 1.29 | -2.02 | 1.88 |
| Real exchange rate against USA, $e_{ij}^R$ | (%) | -1.70 | 1.30 | -2.01 | 1.88 |
| | | | | | |
| Global interest rate, $r^w$ | | 0.00 | 0.00 | 0.00 | 0.00 |
| Investment premium factor, $(1+\pi)$ | (%) | 4.01 | **0.00** | 3.78 | **0.00** |
| Home interest rate, $r$ | (%) | 4.01 | 0.00 | 3.78 | 0.00 |
| Expected long run return on capital, $r^e$ | (%) | **2.50** | **2.50** | **2.50** | **2.50** |
| Current return on installed capital, $r^c$ | (%) | 1.48 | 4.70 | 1.54 | 4.85 |
| | | | | | |
| Real domestic investment, $I$ | (%) | -1.35 | 2.29 | -1.15 | 2.29 |
| Real consumption, $C$ | (%) | -0.54 | 3.68 | 0.59 | 2.63 |
| Real private savings, $S_P$ | (%) | 18.98 | 34.24 | 20.17 | 33.78 |
| Real government savings, $S_G$ | (%) | -40.73 | -41.93 | -39.21 | -43.73 |
| Balance of trade, $X-M = -KA = -(I-S_D)$ | (US$m) | **0.00** | -286.23 | **0.00** | -305.44 |
| *Real gross sectoral output* | (%) | | | | |
| Rice | | -0.03 | 0.18 | 0.06 | 0.09 |
| Coffee | | 0.58 | -0.28 | 0.77 | -0.56 |
| Other crops | | 0.53 | 0.52 | 0.66 | 0.37 |
| Livestock | | 0.05 | 1.20 | 0.11 | 1.21 |
| Food | | -0.21 | -0.04 | -0.10 | -0.14 |
| Fish | | 0.35 | 0.51 | 0.46 | 0.39 |
| Minerals | | -0.07 | 1.09 | 0.12 | 0.95 |
| Energy | | 0.04 | 0.00 | 0.06 | -0.04 |
| Light manufacturing | | 4.05 | 3.13 | 4.48 | 2.58 |
| Heavy manufacturing | | -0.04 | 0.11 | 0.33 | -0.30 |
| Transport | | 0.90 | 0.74 | 1.21 | 0.37 |
| Infrastructure services | | 0.71 | 1.76 | 0.91 | 1.61 |
| Construction and dwellings | | -0.29 | 2.14 | -0.16 | 2.15 |
| Other services | | 0.59 | 1.36 | 0.85 | 1.12 |
| Real GDP, $Y$ | (%) | 0.45 | 1.55 | 0.64 | 1.41 |
| *Unskilled wage and employment* | | | | | |
| Nominal (unskilled) wage, $W$ | (%) | -0.54 | 0.55 | 0.00 | 0.00 |
| Production real wage, $w=W/P^Y$ | (%) | 1.18 | -0.74 | 0.76 | -0.39 |
| Employment, $L^D$ | (%) | 0.68 | 3.32 | 1.11 | 2.99 |
| *Unit factor rewards CPI deflated* | (%) | | | | |
| Land | | 3.52 | 3.54 | 4.31 | 2.64 |
| Unskilled Labour (those employed) | | 0.54 | -0.55 | 0.00 | 0.00 |
| Skilled Labour | | 0.93 | 0.45 | 0.57 | 0.84 |
| Physical capital | | 0.78 | 4.07 | 0.77 | 4.30 |
| Natural Resources | | 2.49 | 1.96 | 3.14 | 1.15 |

a  Fiscal policy 1 has government spending held constant as a share of GDP and the revenue lost from tariff reform is not made up in other taxes, so the fiscal deficit expands.

b  E is the nominal exchange rate in US$ per unit of local currency.

c  $P^C$ is the domestic consumer price level; the CPI.  Note that this is an index of the prices of both home and imported goods.

Source: Model simulations described in the text.

# Table 10: Simulated *short run* effects of a *unilateral* 20% liberalization of  Vietnam's 2001 trade policy regime: fiscal policy

| Change in: | Form of change | Tight capital controls, monetary policy targets the nominal exchange rate, $E$ | | No capital controls, monetary policy targets the nominal exchange rate, $E$ | |
| --- | --- | --- | --- | --- | --- |
| | | Fiscal Policy 1: increase deficit[a] | Fiscal Policy 2: tax mix switch[b] | Fiscal Policy 1: increase deficit[a] | Fiscal Policy 2: tax mix switch[b] |
| Nominal exchange rate (US$/•), $E_i$ | (%) | **0.00** | **0.00** | **0.00** | **0.00** |
| Domestic CPI, $P^C$ | (%) | -1.08 | -0.91 | 1.10 | -0.08 |
| Domestic GDP deflator, $P^Y$ | (%) | -1.70 | -1.47 | 1.30 | -0.32 |
| Nominal Money supply, $M_S$ | (%) | -1.86 | -1.35 | 2.08 | 0.15 |
| Export price of rice | (%) | -1.38 | -0.94 | 1.70 | 0.24 |
| Export price of coffee | (%) | -2.96 | -3.29 | -1.75 | -2.83 |
| Export price of energy | (%) | -0.33 | -0.47 | 0.34 | -0.22 |
| Export price of fish | (%) | -0.01 | 0.01 | 0.22 | 0.09 |
| Import price index | (%) | -0.83 | -1.26 | 0.70 | -0.68 |
| Price of capital goods, $P^K$ | (%) | 0.00 | 0.00 | 0.01 | 0.00 |
| | | | | | |
| Terms of trade | (%) | -0.91 | -0.95 | -0.33 | -0.73 |
| Real effective exchange rate, $e_i^R$ | (%) | -1.70 | -1.47 | 1.29 | -0.33 |
| Real exchange rate against USA, $e_{ij}^R$ | (%) | -1.70 | -1.47 | 1.30 | -0.32 |
| | | | | | |
| Global interest rate, $r^w$ | | 0.00 | 0.00 | 0.00 | 0.00 |
| Investment premium factor, $(1+\pi)$ | (%) | 4.01 | 1.52 | **0.00** | **0.00** |
| Home interest rate, $r$ | (%) | 4.01 | 1.52 | 0.00 | 0.00 |
| Expected long run return on capital, $r^e$ | (%) | **2.50** | **2.26** | **2.50** | **2.26** |
| Current return on installed capital, $r^c$ | (%) | 1.48 | 1.74 | 4.70 | 2.97 |
| | | | | | |
| Real domestic investment, $I$ | (%) | -1.35 | 0.67 | 2.29 | 2.07 |
| Real consumption, $C$ | (%) | -0.54 | -1.20 | 3.68 | 0.40 |
| Real private savings, $S_P$ | (%) | 18.98 | 0.45 | 34.24 | 5.96 |
| Real government savings, $S_G$ | (%) | -40.73 | 0.00 | -41.93 | 0.00 |
| Balance of trade, $X-M = -KA = -(I-S_D)$ | (US$m) | **0.00** | **0.00** | -286.23 | -109.49 |
| | | | | | |
| *Real gross sectoral output* | (%) | | | | |
| Rice | | -0.03 | -0.19 | 0.18 | -0.10 |
| Coffee | | 0.58 | 0.73 | -0.28 | 0.40 |
| Other crops | | 0.53 | 0.48 | 0.52 | 0.47 |
| Livestock | | 0.05 | -0.34 | 1.20 | 0.10 |
| Food | | -0.21 | -0.35 | -0.04 | -0.28 |
| Fish | | 0.35 | 0.23 | 0.51 | 0.29 |
| Minerals | | -0.07 | 0.15 | 1.09 | 0.60 |
| Energy | | 0.04 | 0.03 | 0.00 | 0.02 |
| Light manufacturing | | 4.05 | 4.06 | 3.13 | 3.70 |
| Heavy manufacturing | | -0.04 | 0.06 | 0.11 | 0.12 |
| Transport | | 0.90 | 0.86 | 0.74 | 0.80 |
| Infrastructure services | | 0.71 | 0.43 | 1.76 | 0.83 |
| Construction and dwellings | | -0.29 | 0.12 | 2.14 | 1.05 |
| Other services | | 0.59 | 0.37 | 1.36 | 0.66 |
| Real GDP, $Y$ | (%) | 0.45 | 0.53 | 1.55 | 0.95 |
| | | | | | |
| *Unskilled wage and employment* | | | | | |
| Nominal (unskilled) wage, $W$ | (%) | -0.54 | -0.46 | 0.55 | -0.04 |
| Production real wage, $w=W/P^Y$ | (%) | 1.18 | 1.03 | -0.74 | 0.29 |
| Employment, $L^D$ | (%) | 0.68 | 0.88 | 3.32 | 1.89 |
| | | | | | |
| *Unit factor rewards CPI deflated* | (%) | | | | |
| Land | | 3.52 | 2.22 | 3.54 | 2.22 |
| Unskilled Labour (those employed) | | 0.54 | 0.46 | -0.55 | 0.04 |
| Skilled Labour | | 0.93 | 0.76 | 0.45 | 0.57 |
| Physical capital | | 0.78 | 1.24 | 4.07 | 2.51 |
| Natural Resources | | 2.49 | 2.25 | 1.96 | 2.04 |

a  Fiscal policy 1 has government spending held constant as a share of GDP and the revenue lost from tariff reform is not made up in other taxes, so the fiscal deficit expands.
b  Fiscal policy 2 holds government spending constant as a share of GDP but the rate of indirect tax is allowed to rise so that the fiscal deficit also remains constant as a share of GDP.


Source: Model simulations described in the text.

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