Revised draft

The effects of global shocks on poverty and food security in Vietnam

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Abstract

Vietnam, a transitional economy, has faced a series of shocks from global markets. FDI inflows, rice prices and the global financial crisis have all been influential recent events. We first present a simple conceptual framework for understanding the effects of these shocks on the economy, and especially on poor households. Then we use a general equilibrium model to simulate the effects of external shocks in more detail. In this, we highlight the role of the labor market as a key channel transmitting the effects of shocks across sectors and regions of the economy. Finally, we summarize and appraise the government's policy responses. While price stabilization and stimulus measures may have been effective, macroeconomic stabilization and especially the management of inflation have not. Cost of living increases now threaten to undermine much of the real poverty alleviation achieved in recent years.

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1. Background

In January 2007 Vietnam's WTO accession was finally made official, the culmination of more than a decade of reforms during which the economy's international integration through trade, FDI flows, and labor exports increased in dramatic fashion. Having thus exposed itself to the vicissitudes of the global economy, Vietnam then experienced a strikingly diverse sequence of shocks, in what has become one of the most turbulent periods of world economic activity. The 'discovery' of the country by global investors saw FDI and portfolio capital inflows surge from a 2001-06 average of about \$3bn/yr to almost \$18bn in 2007 alone. Toward the end of that year, the world prices of oil and rice, which together account for 30% of Vietnam's exports, began to climb sharply, peaking in mid-2008. Then in late 2008 the global economy fell into a deep recession, slashing export demand and investment inflows and provoking the government to run large deficits in support of short-term stimulus measures. Vietnam's initial experience of globalization has been a wild ride thus far.

Vietnam is a capital-scarce economy, a net food exporter, and its currency is not freely convertible. So it is reasonable to expect that both the FDI boom and surge in global food prices increased aggregate income, and also that the country was somewhat insulated from capital market component of the global financial meltdown (as had been the case during the 1997 Asian crisis). These are both true. However, more than 50% of the Vietnamese population lives on less than \$2/day, so the degree of vulnerability even to a small downturn is very high.[2] This is especially true of rural households and recent rural-urban migrants whose incomes are linked to the fortunes of export-oriented manufacturing industries. Moreover, despite the country's status as a net food exporter, the vast majority of Vietnamese are net consumers of rice, so both poverty and food insecurity are likely to have been worsened, at least temporarily, for specific segments of the population. The drop in global demand for manufactured exports also reduced jobs and hours worked in the short run. The extent to which these global shocks are felt in the domestic economy, and the distribution of gains and losses associated with them, depends on price transmission, on the intersectoral (and interregional) mobility of labor and other factors, and on policy responses by government, state-owned institutions, domestic and foreign investors, and the international donor community.

The Vietnamese economy has continued to record positive growth throughout the global crisis (Figure 1), despite several quarters of shaky economic indicators in 2008-09.[3] Nonetheless it remains relevant to ask how the poor were impacted by these global shocks, and whether there could be welfare effects outlast the

[2] Vietnam has recently graduated to the status of "middle-income economy", a World Bank designation that carries both rhetorical and practical implications. However, concern with this benchmark should not result in an exclusive focus on *average* incomes without regard to their *distribution*. The Vietnam Household Living Standards Survey data for 2006 (the most recent nationally representative data available) indicated that only 28% of urban households and 6% of rural households had incomes at the World Bank's middle-income threshold for that year (\$905 per person per year). Real economic growth since 2006 has increased these percentages, of course, but not nearly enough so that the income of a majority of the population actually exceeds the middle-income threshold. It is unlikely that even one-fourth of the rural population does so.

[3] Vietnam's estimated 4.65% GDP growth rate in 2009 compares favorably with the only other SE Asian countries not in recession, Indonesia (3.5%) and the Philippines (2.5%), and with the world economy, which experienced an estimated 0.8% recession.

global crisis itself. Ideally, we would also like to know how, and by how much, the government's own 2009 stimulus measures contributed to the avoidance of a recession, and to sustaining the real incomes of the poor. Finally, Vietnam has a recent history of high and persistent inflation. Since the effects of inflation are regressive, it is important to ask what welfare effects it has had, and how continuing inflation, if it persists, might impact upon the poor in the near future.

In this paper we first construct a simple conceptual model for thinking about the effects of shocks and responses on rural incomes and poverty. We then address the three shocks—FDI, food prices, and global recession—and their effects on the economy and on households, especially those most likely to be poor and food insecure. We consider policy responses and inflationary impacts and evaluate their likely impacts in the short and long term. In the final part of the analysis we evaluate some alternative policy options, and draw conclusions.

2. Conceptual framework

2.1. Accounting for rural income growth

Poverty in Vietnam is overwhelmingly a rural phenomenon (Table 1),[4] and agriculture is by far the dominant source of rural income. Therefore, to see the influences at work on rural incomes we first begin with the value of output per farm worker.

Let Y_A be the value of farm output, calculated as the product of physical output Q_A and the farm gate price P_A. In nominal terms, $Y_A = P_A Q_A$. We are interested in accounting for the effects on farm incomes and rural well-being of the internal dynamics of agricultural growth, the connections between agriculture and the rest of the economy, and relevant government policies. To do this, we decompose this expression as follows. Let L_A denote agricultural labor and H_A land, and define an economy-wide price index that can represent both producer and consumer costs (for lack of better data, we suppose that the CPI satisfies this). We also suppose that labor not used in agriculture is employed in urban/industrial sectors; if the total labor size of the labor force is L, then $L_A = L - \lambda L_N$, where λ is an iceberg-type cost of labor migration. Then after some simple arithmetic we have the following expression for real income per agricultural worker, R_A:

$$R_A = \frac{Y_A/L_A}{CPI} = \frac{P_A}{CPI} \cdot \frac{Q_A}{H_A} \cdot \frac{H_A}{L - \lambda L_N}. \tag{1}$$

This expression says that the real productivity of farm labor (Y_A/L_A) is equal to the product of the agricultural real exchange rate measured at the farm gate (P_A/CPI); agricultural yields (Q_A/H_A), and the endowment of arable land per agricultural worker, which we can think of as the reciprocal of a 'land dependency ratio'. Decomposing output per worker in this way focuses attention on the internal

[4] There is increasing controversy over poverty measurement in Vietnam, most of it based on criticism of the methods and implementation of the national living standards survey (VHLSS). While insufficient to negate the statement in the text, it is clear that the VHLSS systematically overlooks migrants, and thus presumably understates both total and urban poverty rates. For discussions, see Pincus and Spender (2007), and McCaig et al. (2009).

dynamics of farm productivity and prices on the one hand, and on the transfer of resources into or out of the sector (rise or fall in $H_A/(L - \lambda L_N)$) on the other. This last ratio has three terms: the economy's endowments of land and labor, and the number of workers in non-agriculture. Increases in the land endowment raise agricultural incomes, while increases in the total labor force reduce it. Benchmark wages are typically determined outside of agriculture, so the size of the denominator adjusts endogenously through intersectoral migration. This has the effect of raising the area of land per agricultural worker, or in other words, reducing the land dependency ratio.

Expression (1) can be converted into the form of growth rates of its components.[5] This reveals that the growth (in percentage terms) of the value of output per farm worker is equal to the sum of percentage growth rates (denoted by G) of each term on the right hand side plus an interaction term; that is,

G(real income/worker) = G(real price) + G(yield) – G(land dependency ratio) + interaction term.

Data relating to this expression are summarized in for the years 1985-2004 in figures 2 and 3, and their decadal growth rates are shown in Table 2. The data are imperfectly measured, so the table shows growth rates of several related variables; these reveal reassuringly similar trends.

The first decade of reform-era growth in Vietnam had mixed results (Figure 2). Land area (for rice, at least) changed very little, and migration of workers from agriculture to other sectors was almost non-existent (Phan and Coxhead 2010). Growth in agricultural output value came from productivity gains: cereal yields rose by almost 30% in 1985-94, an average of over 2.5% per year (Table 2). Use of fertilizer and machinery also rose in dramatic fashion. After fluctuating wildly in the late 1980s, the price of rice settled at a more or less constant nominal value (Figure 3), although with inflation, this meant a pronounced decline in the real exchange rate for rice producers; the real price of rice fell by an average of over 50% per year. Inflation also more than offset early rural income gains from the reform program: by 1994, real income per farm worker was only 90% of its 1985 value. It is a measure of the extreme macroeconomic instability of this decade that the implied error term in the growth expression above is enormous, at 49.3. However, this was also a decade in which macroeconomic stability was progressively restored, with inflation plunging to single digits from an annual rate of 486% in 1986 (IMF 2006).

The reform process began to pay off in the country's second development decade. Agricultural prices stabilized against the CPI. Fertilizer and machinery inputs continued to climb sharply, and cereal yields again grew by 30% over the decade (2.77% per year). Investment in non-agricultural industries accelerated, creating many new jobs outside of agriculture and rural areas. Restrictions on internal migration were also relaxed, with the net result that rural-urban migration (especially to Ho Chi Minh City, where two-thirds of new investments are located) accelerated (Phan and Coxhead 2010). The rural dependency ratio diminished; agricultural land per worker increased at 1.93% per year and was 20% higher in 2004 than in 1995. These changes raised farm incomes: in real terms, income per farm worker

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[5] Formally, for any variable X, let $G(X) = dX/X$, i.e. the proportional growth rate of X. Then for any function $f(X, Y, Z)$, if $f(\bullet) = X \cdot Y/Z$, then $Gf(\bullet) = G(X) + G(Y) - G(Z)$ + error term. The error term appears because we are making a linear approximation of changes to a non-linear function. The size of this term is larger, the greater are changes in the variables relative to their base values.

was 63% higher, and income per rural resident 70% higher, in 2004 compared with 1995. In this decade of relative macroeconomic stability, the implied error term of our growth equation is only 0.86.

In 2005-2009, real farm income per rural resident continued to rise by 3.49 percent annually (GSO). Yield growth in rice slowed considerably, to a more sluggish 1.70 percent annually (GSO). Meanwhile, the transfer of population from rural areas and agriculture to other regions and sectors continued. The rural population fell by 0.15 percent annually in 2005-09, while the urban population increased by 3.27 percent (GSO). Labor employed in agriculture diminished by 0.9 percent during the same period.

During this half-decade, global rice prices rose dramatically. The FAO rice price index increased from 125 in 2005 to 295 in 2008, before falling a little to 253 in 2009. This helped pull up domestic prices: retail rice prices increased from 3,600-4,000 VND per kilogram in January 2005 to 10,000-11,000 VND/kg in at their peak in May 2008. Prevailing retail prices in December 2009 were only slightly lower, at around 9,000-10,000 VND/kg. Food price increases helped push up headline inflation, as food contributes over 40 percent of the CPI basket. From 2006 to 2009, the average annual inflation rate was 11.3 percent, peaking in 2008 at 19.9 percent. Taking inflation into account, from January 2006 to December 2009 the retail rice price increased by 40.2 percent in the North and 59.1 percent in the South.

2.2. A deeper look: structural sources of rural incomes and poverty

In the previous section we accounted for growth in real farm incomes by reference to the agricultural real exchange rate, farm productivity dynamics, and changes in the rural factor endowments, land and labor. We now develop the model one step further, identifying the main medium-run causes of changes each of these terms. This exercise helps us to focus in on the endowments, global market shocks and government policy decisions that are the fundamental causes of the variables in expression (1). In doing so we also provide a more complete characterization of the sources of changes in rural incomes and poverty.

First, consider the farm gate price, P_A (implicitly, this is the price of rice, the most important crop grown in Vietnam, but the analysis applies equally to other tradable agricultural activities). About 40% of Vietnam's rice production is exported in a typical year. The farm gate price is thus closely linked to the global market price P_A^* (measured in \$US). Mapping from the latter to the former involves the nominal exchange rate E (the number of VND per USD), any trade barriers such as export taxes or their equivalents in ad valorem form (τ), and the domestic margin costs $(1 - \mu)$ of converting paddy at the farm gate into milled rice exports. Thus

$$P_A = \frac{\mu \cdot E \cdot P_A^*}{(1+\tau)} \quad \Rightarrow \quad P_A = P_A(E, P_A^*, \mu, \tau). \qquad (2)$$

Next, we define a measure of the agricultural labor force. Assume that the agricultural production function takes a form such as $Q_A = K_A \cdot f^A(L_A, H_A)$, where K_A is the stock of investments in agricultural infrastructure and technological improvement. We suppose that H_A is given exogenously, while $L_A = L - \lambda L_N$ as defined earlier. We assume that L is also exogenous. L_N, however, is a function of relevant prices and complementary factors in the *non-farm* sector. Suppose the non-farm production function to be $Q_N = f^N(L_N, K_N)$. Then by profit maximization, and supposing non-farm production to be tradable, we have:

$$L_N = L_N(E, P_N^*, K_N) \tag{3}$$

Combining (1), (2) and (3), we have

$$R_A = R_A\left(E, P_A^*, P_N^*, K_A, K_N, \bar{H}_A, \bar{L}, \lambda, \mu, \tau, CPI\right), \tag{4}$$

where an overbar denotes an exogenous endowment. The real income of agricultural workers depends on global prices, factor endowments, and policy variables (including E) as well as the CPI. Of course, in a fully-developed general equilibrium system investment, the exchange rate, and the CPI itself have multiple determinants.[6] We do not account for this endogeneity, though we do discuss it at several points below.

The foregoing characterizes real agricultural income. In order to complete the definition of rural income, we must account for income sources other than agricultural production. For the purpose served by this simple model, we can assume that all *earned* income in rural areas comes from agriculture.[8] In Vietnam, two important sources of *unearned* income for rural households are transfers from government and remittances from household members working elsewhere in the economy or abroad (in 2006, about 7% of household income was from remittances, but this ratio is now undoubtedly much higher). Therefore, net real income $\tilde{R}_A$ is:

$$\tilde{R}_A = R_A + (\text{transfers} + \text{remittances})/CPI.$$

We can now define poverty (or at least its rural component), by comparing $\tilde{R}_A$ to a real (inflation-adjusted) poverty line, z. Consider the standard FGT poverty measure (Foster et al. 1984), which is built around a poverty gap defined as the difference between the poverty line and each household's income or expenditure. We can write this as follows:

$$P_\alpha = \frac{1}{nz}\sum_h g_h^\alpha, \quad \text{where} \quad g_h = \left(z - \tilde{R}_A^h\right) \text{ for all rural households h.}$$

Poverty is influenced, through $\tilde{R}_A^h$, by the vector of determinants in expression (4) as well as by unearned income. This measure of poverty can also be decomposed across subgroups of the rural population,

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6 Changes in the CPI are fundamental to the macroeconomic story, and are key determinants of changes in investment and—in the longer run—the exchange rate. Determinants of inflation typically include the output gap (between actual and potential GDP), the money gap (between money supply and the demand for real balances), terms of trade effects, and other structural factors related to the long-term growth and structural change of the economy. For an analysis using Vietnamese data, see IMF (2006). That study finds that productivity-related structural factors (the so-called Balassa-Samuelson effect) have in the past had relatively little explanatory power, whereas the output gap and monetary expansion both contribute a lot to inflation, and real effective exchange rate depreciation reduces it. The study also finds that Vietnam's inflation rate is strongly influenced by previous period's inflation, and that an inflationary impulse takes about 20 months to dissipate, as opposed to about 10 months in other Southeast Asian economies. These findings suggest that inflationary expectations are persistent, perhaps due to the memory of recent high inflation.

8 In Vietnam, nearly all earned rural income is obtained either directly from agriculture, or indirectly through derived demand for rural services such as trade, transport, manufacture and repair of machinery and implements, and housing and construction.

whether by function (net producers, net consumers, etc) or region (Mekong Delta, Central Highlands, etc). These decompositions are likely to be important for a variety of reasons related to the policy parameters λ, μ, and τ, as well as the distribution of transfers and remittance receipts.

The model just sketched is not a fully specified general equilibrium system. It does, however, capture many of the primary determinants of real incomes in rural Vietnam, where poverty and food insecurity are most prevalent. It provides us with the basis for a discussion of the poverty implications of several important shocks to which the Vietnamese economy has recently been subjected, namely the impacts of the 2007-08 FDI boom, the rise in global food prices, the global economic downturn, and at least parts of the policy measures adopted in response.

2.3. Shocks and responses

Using the model just sketched, we can obtain a preliminary ex ante analysis of the effects of shocks on rural poverty. In the following paragraphs we provide a description of each shock, plus the 2009 stimulus package, and show how the analysis proceeds.

FDI shock (2007 to early 2008). Vietnam's total financial inflows leapt from a five-year average of about \$3bn/yr (2002-06) to \$17.7bn in 2007 and \$12.3bn in 2008. A large part of this was additional inflows of FDI.[10] An extrapolation of FDI inflow trends from 2001-06 through the next two years predicts \$6.4bn in 2007-08; instead, the inflow was \$16.7bn (see Appendix). In terms of our model, FDI increases K_N, which raises non-farm labor productivity and increases L_N (as long as $\lambda \neq 0$). From (1), this will raise rural incomes by reducing the land dependency ratio. There will be an additional gain from remittance flows. But through the macroeconomic channel, with a fixed nominal exchange rate and incomplete sterilization the FDI inflow causes money growth to accelerate, which fuels inflation. So rural households that send out migrant workers and receive remittances in return are most likely to gain from the FDI boom, while all households will see the real value of gains eroded somewhat by a rise in the CPI.

Rice price shock (2007-2008). During the global price boom, the price of rice in domestic markets rose by 66% in the North and 72% in the South, against counterfactual rises of 35% and 34% (see Appendix). A rise in P_A^* is a positive terms of trade shock for the economy. From (2) we find the direct impact as $\partial P_A/\partial P_A^* = E(1-\mu)/(1-\tau)$. For fixed nominal exchange rate and export tax (or equivalent), the gain depends on the pass-through parameter, μ as well as the implicit export tax τ. Later in this paper, we present evidence that neither parameter is constant with respect to global rice prices during the boom period.

Once again, there are also indirect effects to consider. For agricultural incomes, the impact of the price boom will be limited by the inelastic supply of land, since this restricts supply response. Also, if the retail rice price increases, then so too does the food component of the CPI. If profits from rice exports are repatriated, there is also a positive influence on money growth, which with a fixed exchange rate is also

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[10] Source: IMF. The FDI component of this inflow leapt from \$2.4bn in 2006 to \$6.7bn and \$9.6bn in 2007 and 2008 respectively. Portfolio capital inflows made up another \$5bn of the 2007 increase.

inflationary. Poverty impacts will depend mostly on whether a given household is a net producer or consumer – see section 3 below. Government interventions in defense of target prices (e.g. for the retail price of rice) may also be influential. Finally, the brief rice export ban in May-July 2008 also helped hold down domestic prices, as will be seen in section 3.

Global economic downturn (late 2008-2009). It is much more difficult to evaluate the domestic effects of the global financial crisis (GFC) than the previous two shocks. Press reports at the time often cited exporters as stating that orders were down by 15%-25%. The data show a drop in US dollar terms of exactly 25% relative to a counterfactual based on export growth in 2001-07 (see Appendix). We can think of this as a collapse in P_N^*. From (1) and (3) we have $\partial R_A/\partial P_N^* = (\partial R_A/\partial L_N)\bullet(\partial L_N/\partial P_N^*) > 0$ if labor is mobile (i.e. if $\lambda>0$). So a drop in P_N^* reduces farm income per capita, and that will be reinforced by loss of remittance income as L_N declines. If E remains fixed, then lower world prices will reduce inflationary pressures, so growth in real incomes won't fall as far as that in nominal incomes. But as the current account moves into deficit, expectations of currency depreciation grow, resulting in capital flight (purchases of gold, for example) and a rising black market currency premium, exerting downward pressure on the exchange rate.

Stimulus package (2009). The magnitude of the domestic stimulus package is also hard to quantify. New spending measures were announced and implemented (see Appendix), but not all public investment projects announced were actually undertaken; transfers intended for the poor may have been redirected; and in the interest rate subsidies offered to firms, there is no way to tell how much new borrowing and business activity was due to the subsidy, and how much would have taken place in any case. Starkly simplified, the stimulus package raises both transfers to households and the public investment components of K_A and K_N. On their own, these measures raise income per agricultural worker, as well as raising labor productivity in non-farm sectors. In conjunction with the global economic downturn, they provide a measure of protection against the loss of non-farm jobs and remittance flows. Much, however, depends on the efficiency of public spending initiatives, the time frame over which investments pay off, and the degree to which transfers actually reach their intended beneficiaries.

In the longer term, there are the macroeconomic consequences of the fiscal and balance of payments deficits to be considered, especially if the stimulus package coincides with ongoing capital flight (due to expectations of a currency depreciation) and the drying up of FDI inflows. Will donors cover the gap? Will financing the deficit be inflationary, thus eroding the real gains of households? Will transfers be sufficient to compensate the poor for loss of real income? Will investments pay off, in medium run, in the form of new jobs or will they be diverted into asset markets?

3. Empirics: effects of the shocks

In this section we investigate the welfare effects of the global shocks, especially on poor rural households. Unfortunately, the most recent representative data on household incomes and expenditures in Vietnam are those in the biannual 2006 Vietnam Household Living Standards Survey, or VHLSS (data from the 2008 round of VHLSS have yet to be released). This section begins with a summary and discussion of the results of a recent econometric study using the 2006 data to measure the poverty and welfare impacts of rice price increases. Then we turn to a less formal evaluation of other shocks. In doing so we also broaden the methodological scope, from partial to general equilibrium. The second part of this section also provides a brief report of some preliminary results from simulation experiments with an applied general equilibrium (AGE) model of the Vietnamese economy. The experiments are designed to draw attention to the role played one of the most important channels for the transmission of shocks from the global economy, the labor market.

3.1. Global rice price shock

Effects of a domestic price increase

Vietnam is a major producer, consumer and exporter of rice, and rice is a major component of its merchandise exports. When the world price of rice fluctuates, it has potentially large effects on the Vietnamese export earnings, household incomes, and consumer welfare. An increase in world rice prices, to the extent that it is passed on to the domestic economy, benefits producers and exporters but hurts consumers, so its impacts on poverty are ambiguous.

In the first and second quarters of 2008, world benchmark rice prices rose very sharply, peaking at an increase of over 250% year-on-year. International prices received by exporters of Vietnamese rice had previously tracked benchmark price changes closely, remaining very close to their long-run average of 93% of the relevant Bangkok fob price (5% broken). But in 2008 Q3 and Q4, they dipped to 86% and 75% of the benchmark price respectively (Figure 4).[11]

In the domestic market, the farm gate paddy (unmilled rice) price and the retail rice price both rose along with the border price, but by much smaller amounts. From January 2008 to its peak in May 2008, the export price rose by 168%, but the farm gate price by only 67% (Figure 5). Subsequently, export and domestic prices fell through the end of 2008. For the year as a whole, exporters' prices rose by 21% and farm gate prices by 9%. Thus only a part of the global price shock was passed through to Vietnam's exporters, and a smaller proportion still was transmitted to domestic consumers and producers (Figure 6). Nevertheless, the shock they experienced was both real and significant. The average nominal retail price in 2008, 5,740 VND/kg, was nearly double that in 2006 (2,921 VND/kg) and remained at that level in the first half of 2009.

In Vietnam, rice is very prominent in consumer expenditures, especially of the poor. Rice is consumed as a staple cereal by virtually all households and contributes 69 percent of daily calorie intake. Moreover, rice prices influence the prices of a broad array of foodstuffs. In addition, the rice crop is by far the most important source of income in agriculture, the sector that directly employs 52% of the labor force—and, of course, a far higher percentage of labor classified as unskilled, and therefore poorly paid. Rice production accounts for nearly 60% of cropland and the vast majority of farm employment. Rural

[11] It is not clear why the Vietnam export price should have diverged so far from the benchmark price during mid-2008. It may be that the Vietnamese exports were dominated by deliveries contracted before the crisis, in which case the international spot price is not the relevant comparison. Other explanations may also be possible.

poverty accounts for almost 90% of total poverty in Vietnam, and according to the VHLSS, four-fifths of poor households are identified as rice-growers (Linh and Glewwe 2008, Table 1).

Using the 2006 VHLSS data, Linh and Glewwe summarize the food production and consumption characteristics of the Vietnamese population. Food accounts for half of households' real expenditure. Consistent with Engel's Law, it makes up 65% percent of real expenditure for the poorest quintile, diminishing to 37% for the richest quintile. Every quintile of the rural income distribution is a net rice seller. Fifty-nine percent of all farmers, and 68% of rice farmers, are net food sellers. However, the distribution is highly skewed: 33% of all rice produced (by value) comes from just 5% of farmers, nearly all of them in the Mekong Delta region.

Using the VHLSS data, Linh and Glewwe evaluate the potential effects of food and rice prices on welfare and on the poor. They do this under partial equilibrium assumptions: their analysis shows how the total expenditure of each type of household would be altered by a change in food (or rice) prices, holding constant the all other sources of possible change, such as land use, labor market adjustments and policy responses. Their study finds that for a 10% rise in food (rice) price, national welfare rises by 1.17% (0.63%), and poverty falls by 0.59% (0.10%). Using price changes observed in 2007, they find that food price increases caused average welfare to rise by 4.3 percent and poverty to fall by 1.3%. Observed rice price increases had smaller effects, raising welfare by 1.1% and reducing poverty by 0.2%.

Of course, these gains were not evenly distributed; in fact, higher food or rice prices make *the majority* of households worse off, in all regions and all quintiles. Higher prices for food and for rice reduce the welfare of all net consumers, with the greatest effect felt by the poorest quintile. The study also shows that the majority of net rice producers are found in the middle-income quintiles. One notable finding is that a rise in the domestic prices of rice is predicted to reduce the welfare of almost two-thirds of households in the Mekong River Delta region, ironically the country's largest and most productive rice-growing region. As the authors point out, "Although it is the biggest rice producing area, a majority of households in the region do not produce any rice and thus are worse-off due to an increase in the price of rice. More specifically, only 37 percent of households in this region grow rice, less than the national average of 53 percent."

<u>Price transmission</u>

The Linh and Glewwe analysis provides estimates of the direct impacts of a domestic price shock. Given the large increases in world market prices in 2008, a another key welfare question is how much of the export price increase was passed on to farmers and consumers. Vietnam's rice export trade is nominally open to all, but in practice it is dominated by two state-owned corporations, Vinafood I in the north, and Vinafood II in the south. In 2008 these corporations accounted for 15% and 41% respectively of the country's total rice exports (Table 3). Our research indicates that there are two price transmission questions to investigate: the extent of overall transmission from global to domestic prices, especially during the global price spike, and the extent (if any) of differences between rice markets in the north and the south of the country. In 2006-09, domestic real rice prices increased by 40 percent in the North and 59 percent in the South. Given the overall increase in the world market, this difference suggests that price transmission in the South is higher than in the North. Borrowing terms from Dawe (2008), it may be that these markets work in somewhat different ways, with the South acting as a "free trader" while the North is a "stabilizer". However, the transmissions fluctuated. Price transmission was higher in the North than the South in 2007 and 2009 but lower in 2006 and 2008.

Figure 6 shows the change in paddy prices compared to that in retail rice prices from 1/2007 to 1/2010. The price changes are very similar, suggesting that these markets are integrated. In the analysis that follows, we use only retail price data, because this series is more complete.

We use an econometric model to examine the pass-through effect of international prices to domestic prices. First, we estimate the following long-term relationships:

$$\ln P_{rt} = \alpha_r + \beta_r \ln P_{Bt} + \varepsilon_{rt}$$

where t denotes time and r region (North, South) so P_{rt} is the market price in region r and time t; P_{Bt} is the f.o.b. export price in local currency terms; α_r and β_r are parameters to be estimated, and ε_{rt} are residuals. In this analysis, we use the prices of Vietnamese rice exports (5% broken) to proxy for world prices.

Data are monthly domestic rice prices and export prices from January 2001 to December 2009. We divide the series into two sub-periods: the pre-crisis period from January 2001 to February 2007, and the crisis period from March 2007 (when for the first time, export rice prices rose above US$ 300 per ton) to December 2009.

The results are shown in Table 4. The estimates of the pass-through elasticity for the whole period were 0.857 in the North and 0.870 in the South. During the pre-crisis period, the pass-through elasticity was 0.732 in the North and 0.724 in the South. During the crisis period, the corresponding estimates were 0.608 in the North and 0.603 in the South. Thus, the level of price transmission is quite high, and similar in both regions.

In the foregoing model, the Augmented Dickey-Fuller (ADF) test of unit root indicated that the residuals were stationary and non-trending in both the whole period and the pre-crisis period. However, the null hypothesis of a unit root failed to be rejected in the regression for the crisis period. In order to capture co-integrating relationships among the price variables and their dynamic relations, we use the Error Correction Model (ECM) (Engle and Granger 1987). This is done by estimating the equation:

$$\Delta \ln(P_{N,S})_t = \alpha_0 + \beta_1 \Delta \ln(P_B)_t + \beta_2 \left[\ln(P_{N,S})_{t-1} - \theta \ln(P_B)_{t-1}\right] + \varepsilon_t,$$

in which Δ is a difference operator, i.e. $\Delta \ln P_t = \ln P_t - \ln P_{t-1}$. The coefficient β_1 is the short-run elasticity; β_2 is the error correction coefficient, and θ is the long-run elasticity.

The ECM model (Table 5) shows that long-run pass-through elasticity estimates in Vietnam were very high, at 0.927 in the North and 0.970 in the South during the period from Jan. 2001 to Dec. 2009. The pass-through elasticities were lower in the crisis period than in the pre-crisis period, suggesting that some export restrictions may have played a role in reducing pass-through elasticities during the food crisis.

Finally, we use the international price of Thai rice 5% broken (converted into Vietnam Dong) as another proxy for world rice price. The results are summarized in Table 6. In the ECM model, pass-through elasticity is estimated at 0.842 in the North and 0.880 in the South. The figures are a little lower in the crisis period than in the pre-crisis period. Comparing Table 5 and Table 6, it is clear that domestic rice prices are more integrated with the export prices of Vietnamese rice than with the benchmark international prices. The difference is normally attributed to lower quality of Vietnamese rice exports, though other explanations (including, as has been charged in the press, technical smuggling by large Vietnamese exporters), are possible. Further investigation of this question is a subject for future research.

3.2. Indirect effects of the shocks

The foregoing analyses have described welfare and distributional changes that are expected to occur if global food prices or manufactured export demands change but all other determinants of income and expenditure remain at their pre-shock levels. In an economy where these commodities are of such great importance, it is likely that there are additional interactions to be considered. These are likely to operate through adjustments in economy-wide factor and product markets and through the macroeconomic effects of any change in the country's overall balance of payments position. It is also possible that some of the market-based outcomes will themselves be subject to influence from the decisions of key actors such as state trading corporations, where these have the capacity to influence prices or quantities in equilibrium. Finally, there are the initial policy settings and the government's own policy responses to be considered.

Trade and sectoral policy in Vietnam has followed a liberalizing trend overall. By the mid-2000s, the real rate of assistance to agriculture (relative to tradable manufacturing) was zero. This apparent policy neutrality, however, disguised a wide range of interventions at the subsector level (Table 7). In 2000-04, the nominal rate of assistance to rice was 22%, higher than at any point in the previous two decades. However, it seems safe to assert that this relatively high rate of assistance was in part caused by a combination of nominal policy targets and (at that time) relatively low rice prices. The NRA data shown in the table provide a good thumbnail summary of sectoral and subsectoral policy biases in mid-decade, prior to the global shocks. The early 2000s were also a period of relative monetary stability, and so provide a helpful benchmark against which to measure the subsequent shocks—to which we now turn.

At the most aggregate level, consider the macroeconomic effects of a *boom in rice exports*, caused by the rise in world prices. For a given quantity of rice exported, and assuming no change in other trade magnitudes, the higher world price is the cause of a rise in net exports, one of the components of final demand. The effects of this rise depend on conditions in the domestic economy. If the economy was initially operating at capacity (with full employment of factors), the rise in net exports opens an expansionary gap. In the absence of a policy response, this will raise aggregate income but also generate inflationary pressures (in the microeconomy, higher prices for some goods raise the value marginal products of factors used to produce them, and this spills through factor markets to all other industries; prices must then rise to maintain zero pure profits). On the other hand, if there is initially spare capacity (including unemployed or underemployed workers), then the rise in net exports may be met by using unemployed resources to expand output in the sectors affected, with diminished cost-push penalties on other industries. The key difference between these cases is that in the first, the rise in net export revenues causes output of some industries to go down and generates inflationary pressures, while in the second it is met at more or less constant prices and with no sacrifice of output in any sector. In both cases, aggregate welfare must rise, but the distribution of gains and potential losses across industries and among the owners of labor, land and capital will differ.

In Vietnam, the most likely case is a mixed one, because low-skill labor is elastically supplied but other factors are not. There is abundant unemployed or underemployed labor (CIEM 2008; Coxhead et al. 2009; Manning 2009), but there is very little idle land suitable for farming.[13] Therefore, the macroeconomic response will depend on microeconomic factors, including firm and consumer responses and the extent and speed of adjustment in the markets for land and labor. In the short run, owners of the least elastically supplied factor (land) will benefit most from the windfall, with some additional gains going to workers who are newly employed or enjoy increased working hours. The rise in land returns will reduce profits in those farm or non-farm sectors that compete for land. Other industries will be minimally affected, as low-skill wages will not change. Moreover, the government may have in place a stabilization mechanism, in which windfall profits are "banked" to provide a cushion against unexpected losses in the future, or a development policy, in which (for example) windfall earnings from exports are diverted to fund rural infrastructure or agricultural R&D. Finally, we cannot rule out the possibility of strategic behavior by large actors in factor and product markets. This could occur, for example, if the companies that dominate Vietnam's rice exports decide to retain windfall profits rather than pass them back to their suppliers or invest them in rural development (VietNamNet 2009).

The effects of the *surge in inward capital flows* are also potentially quite complex. Part of the inflow is FDI, and this addition to the capital stock creates jobs and raises labor productivity—including labor in other sectors, if the labor market is integrated. FDI made up about half of the above-trend investment flow into Vietnam in 2007 and early 2008. Such capital inflows have a strong medium-run impact on growth, despite some crowding-out effects due to competition for land, infrastructure and services. Moreover, since the majority of new jobs are taken by new or recent rural-urban migrants, there is an equally strong increase in remittance flows back to relatively poor rural households. We cannot place a magnitude on these flows as many (probably most) take place outside the banking system. But the increasing number of rural urban migrants—to about 1m/yr from a total labor force of just about 42m—gives a clear prediction of the rise in remittances.

A large majority of the workers in Vietnam's foreign-invested industries are young women. It can be argued that they are among the groups most likely to be unemployed or underemployed in the rural economy. Therefore, is it probable that the labor market adjustment due to FDI has relatively little impact on the rural economy. On balance, FDI should have generated strong gains for rural Vietnam.

On the other hand, 2007 also saw an equally large increase in portfolio capital inflows. These helped drive up asset prices, and for many Vietnamese set in motion a wealth effect which in turn raised many components of consumer demand—for housing, health and education, but also for foreign travel and

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[13] Vietnam's land-labor ratio, at 0.114 ha/rural resident in 2007, is among the lowest in the developing world. Compare China (0.168), Indonesia (0.249) and Thailand (0.522). Source: FAOSTAT.

many other discretionary items. Without a compensating rise in interest rates or other inducements to save, the portfolio capital inflow must have played a major role in fueling inflation (IMF 2006).

Trends and fluctuations in global commodity markets affect the Vietnamese economy both through its external terms of trade and through quantity shifts in the demand for its manufactures, whose prices tend not to vary as much. An *unanticipated drop in net exports* (such as occurred in 2008-09) reduces planned aggregate expenditure, opening a recessionary gap that is associated (in the absence of compensating policy measures) with job destruction and reduced demand for non-traded intermediates such as construction, transport, and domestic trade. Since both the export industries themselves and the intermediate services most directly affected are all quite labor-intensive, the impact on jobs and wages is potentially profound. Because workers in these industries are not especially high-skilled, and many are migrants who remit part of their income to much poorer rural households, the decline in net exports translates into a negative poverty shock as well.

In addition to their direct effects, the shocks just discussed also have potential for indirect effects, largely through inflation and inflationary expectations. The rise in global food (especially rice) prices fed inflation in 2008, adding to the effects of global fuel price rises and the 2007 FDI boom. Rice price rises quickly passed through the economy to many other food products, causing workers to experience declining real income. However, Vietnam was already suffering from high and rising inflation prior to the onset of the global rice price shock, largely as the result of the huge capital inflows of 2007. The rise in inflation began – and even peaked – well in advance of those for rice prices.

Government and the central bank acted to suppress inflation by raising lending rates and bank reserve requirements (see section 4), and while this probably had a significant effect on inflation and inflationary expectations, this monetary tightening further dampened prospects for the stability and growth of employment. Both effects presumably had a depressing influence on remittances by urban workers to their dependents and beneficiaries in the countryside.

3.3 General equilibrium simulation experiments

The difficulty of evaluating cause and effect in assessing the links between macroeconomic shocks and microeconomic outcomes is well known. For normative purposes it is important to have some idea of these links, in order to be able to assess the impacts of shocks on household welfare, and to design policy interventions to best (and least-cost) effect. To do this with rigor requires a framework capable of characterizing growth or policy shocks, and tracing these in a consistent manner through markets and other economic channels down to sectoral, regional and household level.

An appropriate approach to this task is to use an applied general equilibrium (AGE) model. Such models represent the entire economy in simplified numerical form. They combine baseline information from the national accounts and other sources about the decisions and activities of firms, households, enterprises and government with theory-based specifications about market operation, labor, capital and resource supplies, trade balances and other constraints, and the assumed behavior of foreign agents who are the partners in trade and investment. They thus provide a consistent interface between macroeconomic and microeconomic phenomena, at least in the realm of the real economy.

We use an AGE model of the Vietnamese economy to observe the effects of shocks on prices and the incomes of producers and consumers, and through their reactions to these changes, to trace effects on the markets for labor, land and capital, consumer choices, and other consequences. Because households have different patterns of asset ownership, income, and expenditure we can measure effects on income distribution and poverty. The model is based on ongoing collaborative research between U.S. and Vietnamese partners and is described more fully in Coxhead et al. (2008). For the purposes of the present paper, we focus in particular on the operation of one market that is critical to the transmission of shocks from the macroeconomy to households: the labor market.

The modeling platform that we use is based on a "standard" AGE template that has been widely applied in developing countries (Lofgren et al. 2002). The template provides for factor supply, production, domestic and international trade, and consumption, savings and investment by a variety of domestic agents and institutions. Here, to save space we merely summarize the features most relevant to the work addressed in this paper.

The model identifies three aggregate primary factors: land, labor, and capital. Labor is a composite of twelve different types, distinguished by gender, location (urban/rural), and skill (low/medium/high). These categories are based on data in the 2003 Vietnam Social Accounting Matrix (SAM). Labor demands are derived in the usual way from profit-maximizing choices made by a representative firm in each industry. The model posits a nested factor demand structure, with composite factor demand decisions at the top level and demands for each type of labor determined at the next level.

In order to conduct experiments we must make assumptions about labor supply, pricing, and mobility across locations. Because there is little empirical research to guide us, we explore several alternatives, or closures.

Closure 1 assumes that labor of each type is fixed in total supply, so that an increase in demand for that type of labor from one or more industries (job creation) must be matched by an equal reduction (job destruction) in one or more others. In this closure we also assume that rural labor cannot move to urban areas, and vice versa. Closure 1 is based on very restrictive assumptions and exists only as a reference point.

Closure 2 retains the assumption of fixed total quantities of each type of labor, but permits migration between rural and urban regions. If an urban-based industry (e.g., garments and textiles) seeks to expand, it can draw on workers of a given type (e.g., female, medium-skill) from either urban or rural areas. In this closure, migration in response to growth of labor demand in specific industries provides a channel to redistribute the gains of growth from one part of the economy to others. Because we assume a fixed total supply of labor, changes in labor demand also alter wages.

Closure 3 alters closure 2 by assuming that the supply of unskilled labor is elastic at a given (constant) wage. In this closure, job creation in one location and industry can draw in workers from other sectors but also from a pool of unemployed workers. We think of this as reducing underemployment, which is quite high in Vietnam. In this closure we continue to assume a fixed supply of medium and high skill workers, since they are in short supply.

In each closure we assume that some capital in each industry is fixed (immobile), while other capital is mobile (it can be reallocated across sectors). We also assume that trade plus international capital flows add to zero (balance of payments equilibrium) with no change in the government's budget deficit. The fixed nominal exchange rate of VND for USD is the model's numéraire price.

The model contains 16 household types, distinguished by location (urban/rural), sex of household head, and primary income source (farm, own-account, non-farm, unemployed). Households earn income from their ownership of labor, land and capital, and from transfers, and spend it on a range of goods, both those produced domestically and also those imported from abroad.

For purposes of welfare analysis, we augment this model by linking it to the corresponding VHLSS data, which contains information on the incomes and expenditures of some 4,000 households nationwide. This link, from the 'macro' model to 'micro' data, makes it possible simultaneously to conduct two types of experiment. One type is *macrosimulations*, or experiments in which we examine the effects of a growth or policy shock on macroeconomic aggregates such as GDP, CPI, wages, employment and industry outputs. The other type is *microsimulations*, in which we trace the effects of the same shock(s) to the incomes and expenditures of individual households, or to regional and other aggregates. This enables us to draw conclusions about the effects of the shock on income distribution and poverty, both nationally and for subsets of the population, such as urban and rural households.

We conduct three policy experiments. The first approximates the effects of a once-and-for-all increase in world rice prices. The second simulates a boom in FDI inflows, and the third, a sudden drop in global demand for Vietnam's manufactured exports. In the first experiment we also explore the implications of different assumptions about labor mobility and labor supply.

World rice price increase

In the first experiment we assume a 25% increase in the world price of rice exported from Vietnam—the consequence, for example, of an exogenous increase in the global benchmark price. When the world rice price increases, Vietnam, as an exporter, experiences a terms of trade gain, and net producers of rice within the domestic economy are expected to gain as a result. However, to the extent that the price rise is passed on from traders and producers to consumers in the domestic economy, it also has negative impacts on net rice consumers. Though aggregate welfare may change little due to the fixed supply of factors of production and the assumption (other than in closure 3) of full employment in the initial equilibrium, the distribution of gains and losses among domestic agents is of considerable interest. Similarly, when some factors are mobile among industries, a substantial change in relative commodity prices may induce changes in industrial production, factor income, trade, and fiscal revenues and expenditures.

The results show changes that are predicted to take place over and above the effects of 'business as usual' growth. Table 8 summarizes the main macroeconomic results of the experiment. Table 9 summarizes the main effects on wages and employment by labor type, and Table 10 shows effects on poverty and income distribution by household type.[14]

[14] More detailed tables of results are available from the authors on request.

The first row in Table 8 shows that in the short run (with labor fixed) the shock has very little effect on GDP growth. GDP growth is faster (0.37%) when the supply of unskilled labor is flexible (Column 3). Agricultural output increases, as expected, and by more when labor is mobile and the supply of unskilled labor is elastic. In the first two closures services and manufacturing sector output decrease or are essentially unchanged; in the third closure, however, agriculture can add jobs at little cost to the other sectors. These results underscore the complementarity between labor mobility and economic growth.

Table 9 shows the effects on factor returns. When labor is immobile (closure 1), virtually all the gains from higher rice prices accrue to rural workers, and urban workers experience a slight loss in real terms. The immobility of labor excludes urban workers from the direct gains of growth and so contributes to a substantial narrowing of the urban-rural wage gap. However, labor mobility changes this in dramatic fashion. When migration is possible (closure 2), agriculture can hire new workers from either urban or rural areas (we have assumed no migration costs). Now, wage growth is at identical rates for rural and urban workers of each type. The gains from agricultural growth are thus spread much more evenly when measured in terms of percentage wage changes. Because agriculture is unskilled labor-intensive, the gains of medium-skill workers are only half of their unskilled counterparts, and high skill workers experience a small real loss.

In the third closure, the supply of unskilled labor is flexible, and its wage is constant in real terms (the nominal wage rises by the same amount as the CPI). The increase in unskilled labor supply (0.8%, a small percentage change but in a very large fraction of the labor force) raises the productivity of workers of all other skill types, so their real wages now rise substantially.

Some distributional and poverty consequences of the shock can be seen in Table 10. Household income changes are higher when internal migration and flexible labor supplies allow for higher aggregate growth. The national poverty rate declines by a little over 3% from its base rate of 19.1% (i.e. by about 0.6% of population), and by 4% when labor immobility restricts the gains from growth to the rural population. Even within the rural population, however, there are some big differences in poverty outcomes. Male-headed households experience poverty reductions of consistently more than 3.5% in all closures. Female-headed households experience poverty reductions of at most 2.4%. The initial incomes and poverty rates of male and female-headed households are not very different. These contrasting changes reflect a higher tendency for female-headed rural households to be net rice consumers.

By contrast with the partial equilibrium results reported in section 2, this experiment clarifies the role of general equilibrium linkages in a largely agrarian, unskilled-labor intensive economy. When the price of rice increases, our model predicts poverty declines for *all* types of rural households; in this, it differs from the prediction in Linh and Glewwe. The main methodological difference is that the AGE model allows for labor market responses (and a limited land market response), whereas the partial equilibrium approach assesses the effects of the price shock only on direct incomes from rice production. In general equilibrium, higher rice prices translate into a higher marginal value product of unskilled labor, the primary income-earning asset of the poor, and this spreads the gains more evenly between net rice producers and net consumers. Finally, the contrasting results across the three closures confirm that in Vietnam, the intersectoral labor market is one of the most important conduits for distributing the gains from growth, even when the growth itself takes place in specific locations and industries.

<u>FDI boom</u>

In the second experiment we choose the scenario of *increased investment in labor-intensive, export-oriented industries* . In Vietnam, these industries are mainly garments and textiles, leather goods, electronics, and furniture and wood products.[15] The experiment applies a 25% growth shock to the capital stocks of these industries. In Vietnam's 2007 FDI boom, a large fraction of the new investment went into tradable industries (the rest was distributed between services such as banking and finance, and import-substituting heavy industries such as petrochemicals).

This experiment is obviously a very strong simplification of a real-world policy shock. First, we do not account for the source of new capital invested in export industries, so our predictions of *aggregate* gains (increase in GDP) overstate the true gains to the extent that we neglect these costs. Second, since we assume that the investment is all realized in real form, we understate the inflationary impact of a broader investment boom that increases money supply without adding to potential output – as was clearly the case in 2007.

The results are summarized in the second columns of Tables 11 to 13. In these tables, we report only results obtained in closure 3, with integrated rural-urban labor markets, an elastic supply of unskilled workers, and fixed aggregate supplies of semi-skilled and high-skilled workers (for comparison, results from the rice price experiment are repeated in column 1). Table 11 shows that the investment shock raises GDP growth without a big impact on the CPI (see discussion in the previous paragraph). Manufacturing output expands by almost 2%, while the farm sector declines slightly. Employment growth in manufacturing increases, but only by about half the rate of output growth: the investment boom has made the sector more capital-intensive overall. Nevertheless there is a big effect on wages (Table 12), at least for more skilled workers. Since unskilled labor supply is elastic, real wages for these workers are unchanged. Because labor is mobile, the welfare gains from industrial investment spread themselves throughout the economy, as is clear from table 13. Rural poverty declines by 2.1%, and overall poverty by 2.4%. Because wage growth is faster in urban areas and among high-skilled workers, inequality rises somewhat, but this is a second-order effect when compared with the magnitude of the poverty decline. Again, however, our experiment replicates only one part of the reality of Vietnam's FDI boom—the real gain in productivity and earnings—and ignores the other major effect, the surge in domestic inflation caused by uncontrolled money supply growth.

<u>Global financial crisis</u>

Our third experiment is an initial effort to capture the real effects of the global financial meltdown of 2008-09. To Vietnam, this was manifested mainly as a real shock through the trade account. We represent it in the model as an exogenous 25% decline in world demand for the country's labor-intensive manufactured exports. The results (columns 3 of Tables 11 to 13) confirm that when labor is mobile, the

[15] In the model, we class the following as labor-intensive, export-oriented manufacturing: processed fruit and vegetables; processed seafood; ceramics; processed wood products; optical equipment; bicycles; other general machinery; other specialized machinery; electrical machinery; other electrical machinery; TV parts; clothing and finished textiles; carpets; and leather goods. We also include hotels, restaurants and tourism as services industries with strong FDI content and export orientation. Together these industries make up 55% of non-oil exports.

negative impacts of such a shock are as readily distributed throughout the economy as were the gains from FDI growth. Labor immobility provides a partial shield to the rural poor; results in closures 1 and 2 (not shown) have agriculture expanding slightly as the manufacturing sector contracts. But under full labor mobility and with the possibility for un/underemployment among unskilled workers, everyone shares in the losses. GDP falls by 0.26%. Real incomes fall by less because the CPI also declines, by 0.56%. But the real wages of skilled and semi-skilled workers, whose services are intensively used by the manufacturing sector, fall, and unemployment among unskilled workers increases by 0.3%. Poverty rises very sharply: by over 6% overall and in rural areas. Inequality is unaffected.

The experiments just reported shed light on some aspects of the global shocks. They are richer than partial equilibrium results because they take account of at least some of the major macroeconomic phenomena linking sectors and regions of the economy—most notably, the labor market. At the same time, however, the model we have used is static, and as such captures only impacts rather than dynamic outcomes based on changes in circumstances and expectations. And it ignores some of the most important consequences of the shocks: those operating through the monetary economy, and of course government policy responses, to which we now turn.

4. Policy responses to the shocks

As is typical of an economy in transition, markets in Vietnam are still subject to wide-ranging interventions, and economic policies notwithstanding, the application of laws and regulations is prone to change, often with little or no advance discussion or explanation.

4.1. Fiscal and monetary reactions

The huge capital inflows and commodity market shocks of 2007-08 caught the government and the monetary authority unprepared and underequipped. Sterilization measures to prevent inflation in 2007 came too late and were insufficiently strong to prevent an inflationary surge. The rice price boom in 2008 again caught the government unawares and making policy on the run. A short-lived export ban was the main consequence. The 2009 stimulus packages were more carefully considered, although their execution has been as flawed as one might expect from an economy whose financial system is poorly developed and regulated.

In the background to the rice export ban is a history of controls on the rice trade, mainly through export quotas and licenses (Minot and Goletti 2003). In principle, the export market is now open to all. In practice, export trade is dominated by two large parastatal trading corporations, as noted earlier. Although there are over 200 rice-exporting companies operating in Vietnam, these two corporations—Vinafood 1 and Vinafood 2—hold over 55 percent of market share in 2008. There have been some complaints in Vietnamese media that VFA, the semi-government organization in charge of rice exporting policies, has given preferential treatment to these two corporations.[16] To make the matter worse, the

[16] Technically, the VFA does not have rights to assign export quotas to companies. However, it can advise the Government on the *export targets* given to provinces. More importantly, all export companies must register their export contracts with VFA and they can only export with VFA's permission. VFA also sets minimum export prices.

chairman of VFA is concurrently the CEO of Vinafood 2, and many VFA officials are from these two companies, suggesting potential for conflicts of interests in Vietnam's rice trade policies and practices. These two companies also have quasi-monopoly rights in negotiating government-to-government rice export contracts, such as those to the Philippines and Cuba.

The government responded sluggishly to the swiftly-changing economic conditions of 2008-09. The inflationary surge beginning in late 2007 induced monetary and fiscal policy tightening by mid-2008. Base interest rates were raised from 8.25 percent in February 2008 to 14 percent in July 2008[17] and the government also cancelled a range of planned public investment projects. By June 2009, ministries, provinces and state corporations had reportedly decided to postpone, delay or stop nearly 1000 projects, equivalent to 7.8 per cent of the total investment budget. Almost immediately, however, the global economy reversed direction. Macroeconomic policy changes followed quickly as the fiscal and monetary authorities recognized the need for easing to sustain aggregate demand and employment. In terms of monetary policy, the government quickly loosened its policy by reducing the base rate from 14% in October 2008 to 7% in February 2009. The fiscal response included two stimulus packages, one rolled out in and around April 2009, and the other much later in the same year.

The global financial crisis was felt in Vietnam primarily as a temporary drop in export demands, especially for labor-intensive manufactured goods. However, its duration appears to have been quite brief. In late 2008 and early 2009 many thousands of workers in these industries either lost their jobs of were forced to accept fewer working hours (CIEM 2009; ActionAid/Oxfam 2009). This slowdown in tradable manufacturing activity had knock-on effects in sectors providing services to industrial zones and their workers. Many industries reopened their doors in mid to late 2009, however, and the overall growth rate of manufacturing output for the year remained respectable – in fact, very impressive by global standards for that year (ADB 2009).

In early 2010 it seems that the larger, and longer-term impacts on the economy will be felt through fiscal and monetary adjustments. Government income was reduced in 2008-09 by the loss of tax revenues, while its expenditures increased as fiscal stimulus measures were adopted (see below). The result was a dramatic widening of the fiscal deficit, to 7% of GDP in 2009 against about 0% in 2008.

Although measures to minimize the domestic impact of the global meltdown were rolled out throughout 2009, there were two formal stimulus policy announcements. The first, announced in the second quarter, was budgeted at $8bn, or 12% of 2008 GDP.[18] Of this, $5.6bn was earmarked for infrastructure and development projects; $1.6bn for tax breaks or deferments to industry, and $400mn for "welfare", including the introduction of unemployment benefits. Another $1bn was set aside to introduce a four percentage point subsidy on bank loans to businesses for working capital. By mid-2009 about $12-15bn in new loans had been taken out under this scheme, though whether this was for working capital or to refinance existing loans, or to invest in property, stocks and other speculative assets is less clear. The first

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[17] The maximum lending/deposit interest rates may not exceed 150% of base interest rates.

[18] China Daily, http://tinyurl.com/y8ogk97, 14 May 2009.

stimulus package also included a package of measures to support agriculture, including interest-free loans for investments, and interest rate subsidies for working capital (fertilizer and other inputs).

Assessments of the effectiveness of the interest subsidy program are mixed. This policy has arguably helped revitalize the economy and keep it on a positive growth track. Yet, it also increased Vietnam's structural vulnerability to inefficient investments and the consequences of high budget deficits. The government also used the most direct form of stimulus spending- cash grants to poor households. In early 2009 it provided direct cash grants of VND 200,000 ($US12.50) per person for distribution to thousands of poor households on the lunar new year (Tet) holiday. It appears, however, that many of these grants did not reach their intended recipients. In many cases reported by the media, they were appropriated by local officials in the form of fees, gifts or contributions to obscure community funds.

The second stimulus package, announced in late 2009, extended interest rate subsidies to agriculture, export-oriented firms and labor-intensive industries through the end of 2010, albeit at a lower rate than the subsidies announced earlier in the year.[19]

How effective were stimulus measures at sustaining growth or preventing the poor from becoming poorer and/or more food insecure? To date, data limitations have forestalled answers to this question. The general consensus shared by academics and international organizations is that the stimulus measures have been fairly successful in helping economic recovery, but that they have also carried risks, in the form of looming inflation, and a "bubble" in the real estate sector. In agriculture, the contribution of stimulus measures has been limited as there were very few farmers eligible for subsidized loans. For example, from January to July 2009, in Dong Nai, a mainly agricultural province, the Bank of Agriculture lent 2,243bn VND (about US$ 124.5m) to over 30,000 clients under the interest-subsidy package. Yet only 440m VND (about US$24,000) or a mere 0.02 percent of total loans were for farmers to buy agricultural machinery, fertilizers or other agricultural inputs. In Can Tho, another major rice producing province, from April to mid August 2009, this program lent only VND160 million to 5 farmers.

In Vietnam as a whole, until October 2009 the total outstanding interest-subsidy loan values used for agriculture (Decision 497) was VND 819bn (about US$ 4m), or about 0.21 percent of the total value of interest-subsidy loans. Thus it is unlikely that stimulus measures have been effective in enhancing investment in agriculture.

4.2. Donor reactions

Another important policy response comes from the international donor community. After sharp increases in ODA commitments and disbursements in 2007 and 2008, ODA commitments for 2009 nearly doubled, from $US2.5bn in 2008 to $US5.8bn in 2009. If disbursement of the 2009 commitment continues at its historic rate (80% of commitments), then ODA to Vietnam in the current year will reach $US4.73bn, about $2.2bn higher than the year before.[20] This very substantial increase (equal to 44% of the 2008

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[19] Vietnam Financial Review, http://tinyurl.com/yghu3ku, 2 December 2009.

[20] Sources: ODA DAC data from http://stats.oecd.org/qwids, downloaded 22 February 2010, and Vietnam Ministry of Planning and Investment, http://tinyurl.com/yzn48n8, accessed 22 February 2010.

current account deficit) was intended to support the stimulus measures. It is also, however, large enough to play a role in supporting the continued real exchange rate overvaluation, thus arguably undermining some of its own good intentions.[21]

5. Longer-run consequences of shocks and policy responses

We have argued that in Vietnam, the direct effects both of the rice price shock and of the global crisis shock were quite short-lived. The domestic impact of the rice price shock was in any case diminished because exporters absorbed a large share, not passing it fully on to either farmers or consumers. The export demand drop associated with the GFC was clearly temporary: press accounts talk of firms that had laid off workers in early 2009 seeking to hire them back again just a few months later. Many workers adopted job-sharing and other coping strategies to minimize the impacts of job cuts, and in order not to have to reverse their migration decision altogether. As in Thailand's earlier crisis (1997-98) the majority of rural-urban migrants seem to have elected to wait out the downturn in the hope—ultimately realized—that it would indeed be temporary.

As we see it there are two types of longer-run issue arising from the shocks and the responses to them. The first is whether any of the new income or spending associated with the shocks (other than the FDI inflow, of course) is spent in ways that enhance the productivity of the poor, or their capacity to withstand future shocks. First, what part, if any, of the windfall to rice exporters shown in Figure 6 has been plowed back into agricultural investments, or will be available for stabilization purposes in the event of a future price decline? Second, what part (if any) of the government's stimulus packages has been spent in ways that do more than support consumption in the current period? Third, what (if any) were the longer-run impacts of the severe fiscal and monetary tightening undertaken in the first half of 2008 as a means to fight inflation?

Another potentially important long-run issue concerns the real effects of persistent inflation. Inflation in Vietnam has remained considerably higher than in the world economy, as proxied by U.S. inflation (see figure 8), and has also been more persistent in Vietnam than in other developing Asian economies (IMF 2006).[22] With a de facto peg of the dong against the USD, this meant an appreciation of the RER from 2002-2007 of approximately 1.12% per year (Figure 8). But from December 2007 inflation accelerated very sharply, while the nominal value of the VND was held roughly constant until June 2008. The resulting real RER appreciation, at 5.46 % per year for 2008 and 2009, exceeded its trend rate by 4.34%.

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[21] Another important group of foreigners is tourists. Tourism accounts for about 4.5% of the Vietnamese economy and (by some estimates) over 10% of its labor force. Tourist arrivals had been growing at an annual average rate of X% in the years prior to 2009. But 2009 international visitor arrivals were 10.9% lower than those in 2008, and tourism arrivals in 2009 were only 85.2% of those in 2008 (Vietnam National Administration of Tourism, 31 Dec. 2009 http://tinyurl.com/yazu7wc.

[22] According to the IMF study, in Vietnam "stronger inflation inertia than in other Asian countries has implied that recent food supply and oil price shocks have resulted in a more permanent increase in core inflation" (IMF 2006: 30). The study also estimates that in Vietnam the "optimal" inflation rate (i.e. that at which its effects on growth are neutral, and above which they are negative) is 3.6%. Vietnam's annual inflation rate has exceeded that level every year since 2004, frequently by a factor of more than 2.

It is reasonable to suppose that the real appreciation eroded the competitiveness of Vietnam's tradable industries, limiting capacity to exploit the global rice price surge, but also slowing the growth of other export crops (rubber, coffee, pepper, cashew) as well as aquaculture and labor-intensive manufacturing.[23] In terms of real rural household income, the real appreciation probably made a significant contribution to lower growth by reducing the international demand for farm output, lowering incentives for investments to create non-farm manufacturing jobs, and raising the cost of living of all consumers. Depending on the base used for extrapolation of inflation and real exchange rate trends, the real appreciation remained above its trend for between one year (roughly, calendar 2008) and two (through the end of 2009). This leaves open the question of what part of Vietnam's growth slowdown in 2008-09 was due to the effects of the global economic crisis, and what to the negative impact of inflation on investment, net exports, and other components of aggregate expenditure. Finally, it will be equally interesting, when the data become available, to decompose changes in poverty and income distribution during the boom/crisis period in a way that accounts not only for the real shocks but also for their inflationary impacts.

Thinking this through further draws attention to the role of fiscal, exchange rate and monetary policies. Measures to reduce inflation were adopted in mid-2008 several quarters *after* the CPI began its sharp rise, and this delay – added to the persistence of inflation in the Vietnamese economy—coincided with the dramatic appreciation of the real exchange rate. At 6.5% in 2009 (2.4 times the U.S. rate), inflation has proved difficult to control in spite a large drop in actual relative to potential output. There is ample motivation, and plenty of scope, for improvements in macroeconomic stabilization and management. These are likely to deliver gains both in terms of overall economic growth and in preserving the real value of those gains from globalization and growth that reach the rural poor.

6. Conclusions

Rising global food prices have sparked serious concerns about impacts on purchasing power and welfare in low-income economies. Equally strong concerns have been voiced about GFC-driven downturns in global export demand and the supply of capital to trade-dependent economies. The net effects of these two global shocks were relatively small in Vietnam, a net food-exporter with limited exposure to short-term international capital flows. Government policy responses were appropriate and arguably effective, at least in the short run. Domestic rice prices were partially stabilized, and job losses due to the GFC were limited and brief. But there is little evidence to date that either rice policies or stimulus measures will have positive impacts in the longer term. Moreover, macroeconomic stabilization has been much less effective, and in the wake of a separate shock – the huge inflow of investment capital that accompanied Vietnam's WTO accession-- the lack of an effective stabilization policy has probably harmed the welfare of Vietnam's poor.

[23] In rice, however, appreciation of the Thai baht relative to the VND may be reducing Thailand's global rice market share and increasing VN share (Vietnamnet, 21/7/2009).

Several important questions remain unanswered. There is widespread concern that windfall gains by state-owned rice traders in 2008 were not deployed either in defense of short-term stabilization or to promote longer run productivity gains in the industry. This is a question mark over the efficacy of government policy responses to the rice crisis. There is a need for further research to determine how much of the difference between global price trends and those in the domestic market could be described as genuine stabilization, and how much as rent-capture by the two dominant rice exporting firms.

Likewise, there is concern that stimulus measures were less effective than they should have been due to the combination of a lack of absorptive capacity and insufficient oversight over the disbursement of stimulus funds. Charges include corruption at local levels, and the diversion of subsidized loans to industry from their intended use (working capital) to speculation in asset markets. As with rice trade, these problems are institutional in nature and point to the need for long-term development as well as short-run stabilization to be underpinned by policy and other reforms to reduce inefficiency, corruption and mismanagement.

Finally, there is a need to reconsider the consequences of persistent inflation. Vietnam has successfully overcome very severe inflationary outbreaks in the recent past, but the relatively high and persistent inflation of the past three years continues to undermine efforts to achieve macroeconomic stability. The government predicts a CPI rise of 8-9% in 2010 and in early 2010 legislated a 12.3% rise in minimum wages for public servants and employees of state-owned enterprises.[24] The budget deficit had been forecast to diminish in 2010 due to the resumption in industrial activity as well as the deferral of some tax payments from 2009 (a provision of that year's stimulus program). In early 2010, however, it seems that the deficit is likely to persist and perhaps even to expand. Finally, the government has recently responded to inflationary and exchange rate pressures by proposing to fix the domestic prices of a range goods and to restrict imports, especially of goods perceived as luxuries. These measures do not promote confidence in capacity for macroeconomic management. All of these trends undermine confidence in the economy, the currency peg, and prospects for future growth, none of which augurs well for the vast majority of workers, to whom minimum wage laws do not apply. In the longer run, the inflationary erosion of the real incomes of the poor may turn out to be far more serious in its effects on poverty than any of the global market shocks we have considered. If so, then a concern with long-term welfare of Vietnam's poor demands a careful reappraisal of its own macroeconomic policies.

[24] WSJ.com, March 26 2010.

Appendix: Calculating counterfactuals

Our assessments of the magnitudes of shocks experience by the Vietnamese economy are based on counterfactuals. These are computed as shown in this Appendix. It is important to keep in mind that the Vietnamese economy was anything by static during this period. During 2001-06 the average GDP growth rate accelerated, and both exports and imports grew at an average rate of approximately 18% per year.

Foreign direct investment inflow

From 2001-06, FDI inflows to Vietnam grew at an accelerating rate (Table A-1). A polynomial fitted to these 6 observations in Excel yields FDI = $51.89t^2 - 154.05t + 1437.8$, which tracks the actual data almost perfectly. This is used to generate the forecast values shown in the table for 2007 and 2008.

Table A-1: Actual and predicted FDI inflows, 2001-08 ($USm)

Year	Actual FDI	Growth rate (%)	Predicted FDI	Difference
2001	1,300		1,338	-38
2002	1,400	7.692	1,339	61
2003	1,450	3.571	1,445	5
2004	1,610	11.034	1,654	-44
2005	1,954	21.366	1,967	-13
2006	2,400	22.825	2,384	16
2007	6,700	179.167	2,904	3,796
2008	9,579	42.970	3,529	6,050

Source of FDI data: IFS Online.

Rice price change

The counterfactual rice price has several components (Jayasuriya, n.d.). These can be seen in equation (2). In growth rates of variables (denoted by a caret ^), this expression is:

$$\hat{P}_A = \hat{P}_A^* + \hat{E} + \hat{\mu} - \tfrac{\tau}{1-\tau}\hat{\tau}.$$

In the long run, a shock to global rice prices may be large enough to affect the nominal exchange rate, E. But more immediate concerns exist about the value of the pass-though from the f.o.b. price P_A^* to domestic producers or consumers, and that of the export tax rate equivalent, τ. Our analysis shows the pass-though margin to have changed significantly during the rice price boom. The Vietnamese government, in applying a short-lived ban on the signing of new export contracts in mid-2008, exogenously altered the value of τ. So the counterfactual domestic price must be based on constant values of these two parameters. From the data, the average annual rise in f.o.b. prices in 2001-2006 was 7.8% (North) and 7.6% (South). Using these rates, the counterfactual price rise can be computed for 2007-09. This price and the actual domestic prices are shown in Table A-2.

Table A-2: Actual and predicted rice price increases, 2001-09 (percent)

	North	South
Annual price increase 2001-06	7.81	7.58
Annual price increase 2007-09	15.05	17.16
Actual price increase 2006-09	65.85	71.67
Counterfactual price increase 2006-09	35.09	33.97

Global financial crisis

We limit our exploration of the crisis impact to that of a drop in export demand. From IFS export data (Table A-3), the average annual growth rate of exports in 2001-07 was 19% (we omit 2008 as an atypical year). Had exports continued to grow at the same rate in 2008-09, they would have reached $74,573. The actual figure, $55,775, is 25.2% lower than this.

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Exports ($USm)	14,483	15,029	16,706	20,149	26,485	32,442	39,605	48,302	62,628	55,775
Annual growth (%)		3.77	11.16	20.61	31.44	22.49	22.08	21.96	29.66	-10.94

Source: IFS online.

Stimulus package

The stimulus measures announced by the Vietnamese government in mid-2008 are summarized in Table A-4. There is no adequate way to construct a counterfactual for overall government spending.

Table A-4. Stimulus package measures, 2009

Item	Budget allocation
Subsidize bank loans to businesses: 4 percentage point subsidy on new loans for working capital	$1 billion
Spending on infrastructure and development projects: spending from budget, credit guarantee to enterprises, bond issuance to finance development projects	$5 billion
Tax breaks : reduce or defer corporate tax, income tax, and VAT.	$1.6 billion
Social safety net : cash grant to poor households, introducing unemployment benefits, supporting lay-off workers and employers	$400 million
Total proposed package	$8 billion (12% GDP)
Estimated actual disbursement	$9 billion

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Tables and figures

Table 1: Household poverty in Vietnam, 2004[25]

	Number of people (000)	Population share (%)	Poverty rate (%)	Share in poverty (%)
Rural	60,017	74.2	21.78	84.77
Urban	20,849	25.8	11.26	15.23
Total	80,866	100.0	19.07	100.00

Source: Computed from VHLSS 2004.

Table 2. Average growth rates (per cent per year) for real rural incomes and related variables[26]

	1985-1994	1995-2004
Real farm income per ag. worker	–1.10	5.03
Real farm gate paddy price	–51.55	–0.53
Rice yield	2.54	2.77
Ag. land per ag. worker	–1.39	1.93
Unaccounted component of real income growth[a]	(49.3)	(0.86)
Memo item and comparison variables:		
Consumer price index	98.64	3.25
Real farm income per rural resident	–0.83	5.47
Fertilizer consumption per hectare	10.01	4.44
Rural population density	1.98	–1.32

a. See text for explanation

Note: Incomes and prices are in VND deflated by annual average CPI.

Sources of basic data: WDI Online (except nominal paddy price: IRRI; CPI: IMF).

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[25] Data in this table are compiled from the file Baseline poverty data 2004 VHLSS.docx

[26] Data for this table and figures 1 and 2 are from the file WDI data for basic indicators table.xls

Table 3. Vietnam: Top 10 rice exporters in 2008

	Company	Values	Quantities	Average prices	Market share
		(mil. USD)	(000 ton)	(USD/ton)	(per cent)
1	Vinafood 2	1,189	1,730	687	40.9
2	Vinafood 1	432	518	834	14.9
3	Kien Giang Tourism & Trade Co.	146	293	499	5.0
4	Gentraco JSC.	96	204	474	3.3
5	Kien Giang Agro-forestry JSC.	59	113	519	2.0
6	An Giang Ex-Import JSC.	53	90	587	1.8
7	Tien Giang Food Company	52	88	589	1.8
8	Vinh Long Food & Foodstuffs JSC.	52	100	518	1.8
9	Long An Food Company	44	89	496	1.5
10	Kien Giang Agric. Prod. JSC.	43	92	460	1.5
	All Top 10	2,166	3,318	653	74.4
	All exporters (205 companies)	2,910	4,830	602	100.0

Source:

Table 4: Long-run pass-through elasticity (static model)

	North		South	
All period (Jan, 2001-Dec, 2009)	Coef.	t-stat	Coef.	t-stat
log of export prices	0.857	34.81**	0.870	32.89**
Constant	1.260	6.10**	1.048	4.71**
ADF Test for residuals	-3.25		-3.24	
5% critical values	-2.89		-2.89	
Pre-crisis period (Jan, 2001-Feb, 2007)				
log of export prices	0.732	18.92**	0.724	23.07**
Constant	2.249	7.16**	2.212	8.68**
ADF Test for residuals	-3.27		-3.10	
5% critical values	-2.92		-2.92	
Crisis period (March, 2007- Dec, 2009)				
log of export prices	0.608	8.35**	0.603	6.99**
Constant	3.522	5.41**	3.486	4.53**
ADF Test for residuals	-1.59		-1.78	
5% critical values	-2.98		-2.98	

Table 5: Pass-through elasticity: Error Correction Model

Dependent variable:	North		South	
Δ(domestic prices)	Coef.	t-stat	Coef.	t-stat
Whole period				
Δ(export prices)	0.153	2.80**	0.105	1.83*
Lagged domestic prices	-0.226	-6.29**	-0.207	-5.88**
Lagged export prices	0.210	6.54**	0.200	6.28**
Constant	0.162	1.84*	0.054	0.62
R-square	0.356		0.311	
Number of observations	100		100	
Short-run pass-through elasticity	0.153		0.105	
Long-run pass-through elasticity	0.927		0.970	
Error-correction coefficient	0.210		0.200	
Pre-crisis period				
Δ (export prices)	-0.208	-1.65*	0.000	0.00
Lagged domestic prices	-0.313	-4.79**	-0.306	-5.03**
Lagged export prices	0.253	4.91**	0.245	5.25**
Constant	0.520	2.28**	0.497	2.67**
R-square	0.303		0.310	
Number of observations	66		66	
Short-run pass-through elasticity	-0.208		0.000	
Long-run pass-through elasticity	0.809		0.799	
Error-correction coefficient	0.253		0.245	
Crisis period				
Δ (export prices)	0.185	2.81**	0.076	0.82
Lagged domestic prices	-0.257	-4.57**	-0.263	-3.95**
Lagged export prices	0.199	4.88**	0.196	3.76**
Constant	0.537	1.87*	0.599	1.6
R-square	0.570		0.382	
Number of observations	34		34	
Short-run pass-through elasticity	0.185		0.076	
Long-run pass-through elasticity	0.774		0.745	
Error-correction coefficient	0.199		0.196	

** significant at 5%; * significant at 10%.

Table 6: Pass-through elasticity with Thai rice prices as world prices.

	Static model		Error Correction Model	
	North	South	North	South
All period				
Short-run pass-through elasticity			0.204	0.131
Long-run pass-through elasticity	0.815	0.828	0.842	0.880
Pre-crisis period				
Short-run pass-through elasticity			0.243	0.110
Long-run pass-through elasticity	0.678	0.654	0.700	0.700
Crisis period				
Short-run pass-through elasticity			0.148	0.095
Long-run pass-through elasticity	0.658	0.677	0.684	0.691

Table 7. Vietnam: Nominal and real rates of assistance to agriculture

Indicator	1986-89	1990-94	1995-99	2000-04
NRA: Exportables	-13.3	-27.2	-2.1	16.9
Rice	-2.8	-26.6	-0.4	22.9
Rubber	—	21.2	18.6	16.8
Coffee	-49.4	-21.1	-7.1	-12.0
Pig meat	-41.8	-37.5	-6.1	8.9
Poultry	-3.1	-3.6	3.7	1.6
NRA: Import-competing	5.1	-0.7	-5.8	24.7
Sugar	—	49.6	112.9	160.2
NRA, all agriculture	-16.1	-26.4	0.0	20.7
NRA, non-agriculture	4.3	-11.2	1.5	20.8
RRA, agriculture	-19.4	-17.4	-1.3	0.0

Source: Athukorala et al. (2009).

Table 8: Macroeconomic effects of rice export price increase (percent change)

	Labor market assumptions		
	No migration, fixed total supply of each labor type	Migration, fixed total supply of each labor type	Migration, flexible supply of unskilled, fixed supplies of skilled labor
Change in real GDP (%)	0.013	0.013	0.337
Change in CPI (%)	0.676	0.650	0.535
Employment change by aggregate sector (%)			
Agriculture	0.430	0.817	1.579
Manufacturing	0.038	-0.024	0.474
Services	-0.094	-0.483	0.005
Output change by aggregate sector (%)			
Agriculture	0.252	0.508	0.948
Manufacturing	0.232	0.215	0.470
Services	-0.015	-0.264	0.052

Table 9: Wage and employment effects of rice export price increase (Percent change)

	Labor market assumptions		
	No migration, fixed total supply of each labor type	Migration, fixed total supply of each labor type	Migration, flexible supply of unskilled, fixed supplies of skilled labor
Change in real wage (%)			
Rural male unskilled	2.870	1.992	0.535
Rural male medium-skilled	2.868	0.855	2.507
Rural male high-skilled	2.909	-0.480	1.008
Rural female unskilled	2.870	1.984	0.535
Rural female medium-skilled	2.867	0.601	2.222
Rural female high-skilled	2.908	-0.339	1.166
Urban male unskilled	-0.195	1.992	0.535
Urban male medium-skilled	-0.195	0.855	2.507
Urban male high-skilled	-0.195	-0.480	1.008
Urban female unskilled	-0.195	1.984	0.535
Urban female medium-skilled	-0.195	0.601	2.222
Urban female high-skilled	-0.194	-0.339	1.166
Change in non-labor factor returns (%)			
Land	1.871	1.862	2.323
Mobile capital	0.030	-0.052	0.396
Fixed capital (average)	1.702	1.695	2.156
Change in unskilled labor supply (%)	0*	0*	0.802

* Fixed at zero by assumption.

Table 10: Poverty and income distribution effects of rice export price increase (Percent change)

		Labor market assumptions		
		No migration, fixed total supply of each labor type	Migration, fixed total supply of each labor type	Migration, flex supply of unskilled, fixed supply of skilled L
Per capita income (VND*10^6)	Baseline	Percentage change from baseline		
Country	499	1.51	1.34	1.57
Urban	809	0.71	1.05	1.64
Rural	395	2.08	1.55	1.51
Poverty rate (Headcount, %)				
Country	19.1%	-3.94	-3.53	-3.34
Urban	11.3%	-1.73	-2.95	-3.54
Male-headed HH	13.0%	-1.93	-3.44	-2.75
Female-headed HH	8.3%	0.00	-2.47	-4.90
Rural	21.8%	-4.34	-3.64	-3.30
Male-headed HH	22.3%	-4.48	-3.89	-3.56
Female-headed HH	19.3%	-2.42	-1.75	-1.75
Inequality (Gini coefficient)				
Country	0.404	-0.41	-0.26	0.08
Urban	0.378	-0.09	-0.33	-0.11
Rural	0.355	-0.06	-0.14	0.07

Table 11: Macroeconomic effects of global shocks (percent change): Closure 3

	Experiments		
	RICE: 25% increase in export rice price	FDI: 25% increase in K stock of L-int mfg	GFC: 25% decline in world demand for L-int mfg exports
Change in real GDP (%)	0.337	0.693	-0.262
Change in CPI (%)	0.535	0.234	-0.560
Employment change by aggregate sector (%)			
Agriculture	1.579	-0.231	0.513
Manufacturing	0.474	0.898	-2.424
Services	0.005	0.661	0.048
Output change by aggregate sector (%)			
Agriculture	0.948	-0.187	0.392
Manufacturing	0.470	1.978	-1.738
Services	0.052	0.987	0.124

Table 12: Wage and employment effects of global shocks (percent change): Closure 3

	Experiments		
	RICE: 25% increase in export rice price	FDI: 25% increase in K stock of L-int mfg	GFC: 25% decline in world demand for L-int mfg exports
Change in real wage (%)			
Rural male unskilled	0.535	0.234	-0.560
Rural male medium-skilled	2.507	2.173	-2.129
Rural male high-skilled	1.008	2.552	-2.504
Rural female unskilled	0.535	0.234	-0.560
Rural female medium-skilled	2.222	2.445	-2.201
Rural female high-skilled	1.166	2.512	-2.465
Urban male unskilled	0.535	0.234	-0.560
Urban male medium-skilled	2.507	2.173	-2.129
Urban male high-skilled	1.008	2.552	-2.504
Urban female unskilled	0.535	0.234	-0.560
Urban female medium-skilled	2.222	2.445	-2.201
Urban female high-skilled	1.166	2.512	-2.465
Change in non-labor factor returns (%)			
Land	2.323	1.967	-3.345
Mobile capital	0.396	1.430	-1.752
Fixed capital (average)	2.156	-5.031	-3.339
Change in unskilled labor supply (%)	0.802	0.402	-0.316

Table 13: Poverty and income distribution effects of global shocks (percent change): Closure 3

		Experiments		
		RICE: 25% increase in export rice price	FDI: 25% increase in K stock of L-int mfg	GFC: 25% decline in world demand for L-int mfg exports
Per capita income (VND*10^6)	Baseline	Percentage change from baseline		
Country	499	1.57	1.23	-2.37
Urban	809	1.64	1.56	-2.57
Rural	395	1.51	0.99	-2.23
Poverty rate (Headcount, %)				
Country	19.1%	-3.34	-2.36	6.42
Urban	11.3%	-3.54	-3.54	6.11
Rural	21.8%	-3.30	-2.14	6.48
Inequality (Gini coefficient)				
Country	0.404	0.08	0.23	-0.02
Urban	0.378	-0.11	0.19	-0.08
Rural	0.355	0.07	0.18	-0.01

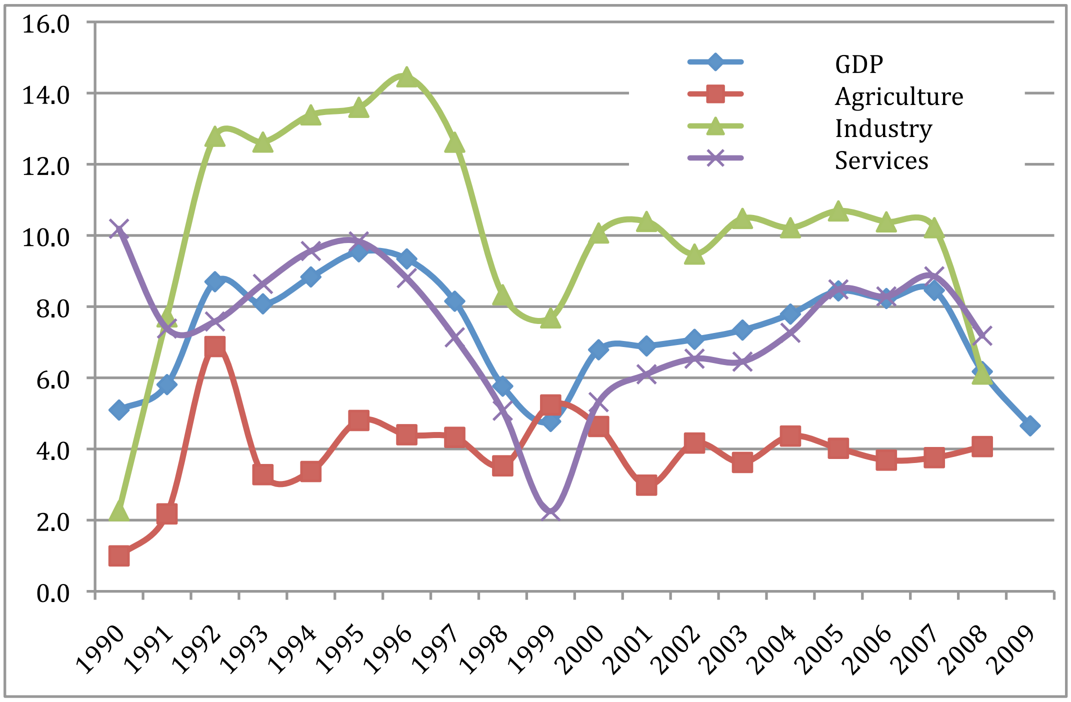

Figure 1: Vietnam: Growth rates of GDP and main sectors, 1990-2009 (Source: ADB).

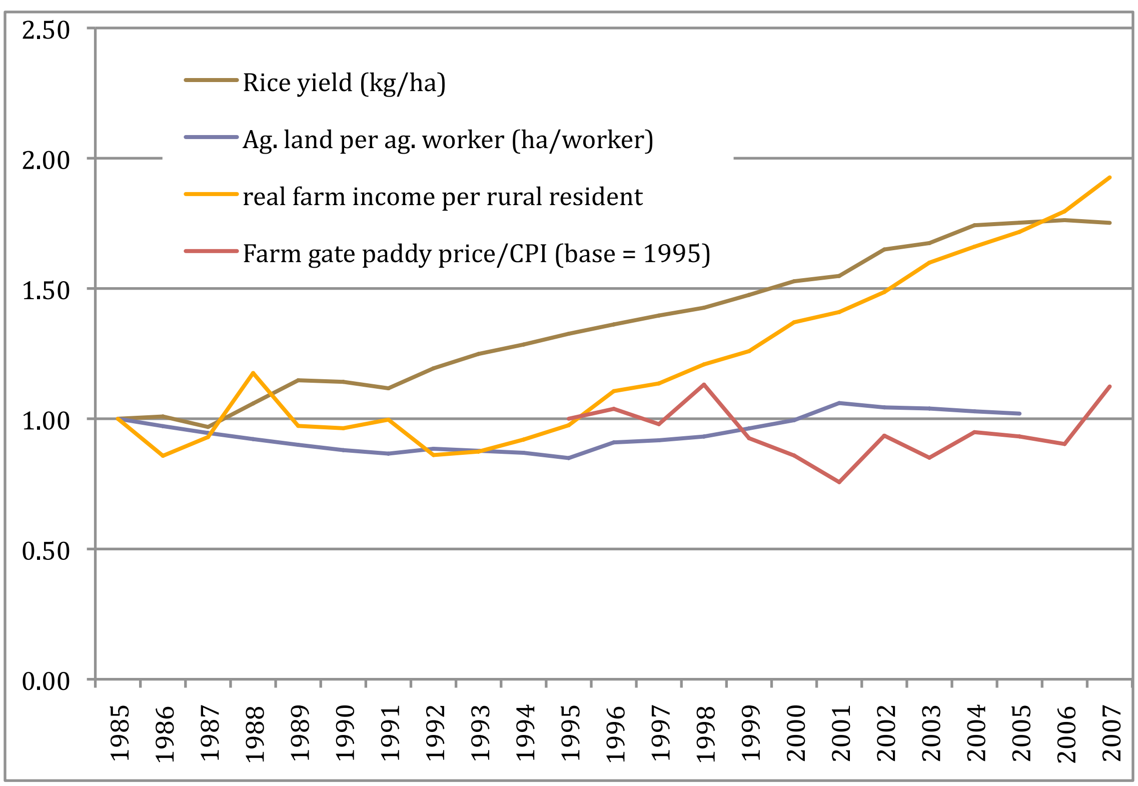

Figure 2: Trends in agricultural income and related variables

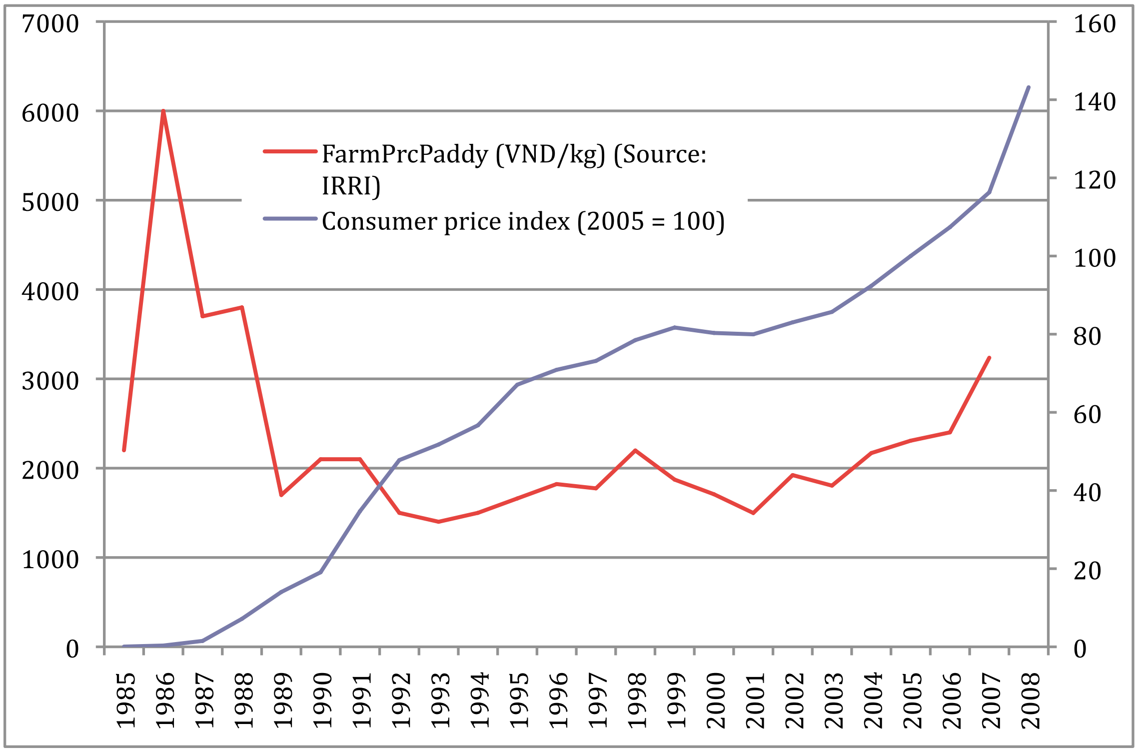

Figure 3: Trends in CPI and paddy price

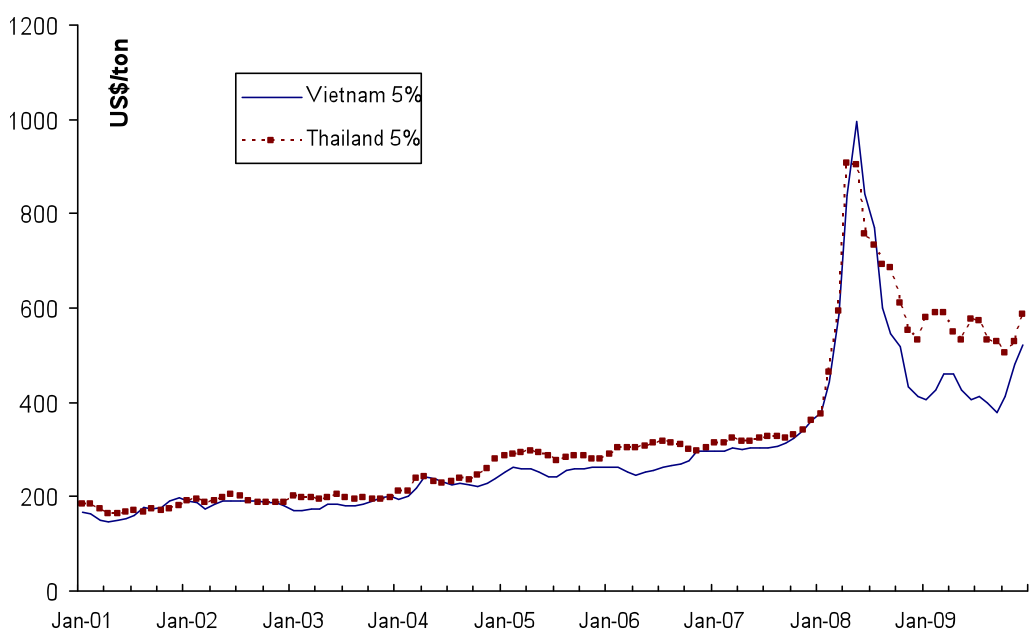

Figure 4: Prices of Thailand's rice 5% and Vietnam's rice 5%

Source: Vietnam rice 5%: FAO Rice Market Outlook and Rice Price Update, various issues; Thailand rice 5%: World Rice Statistics, IRRI.

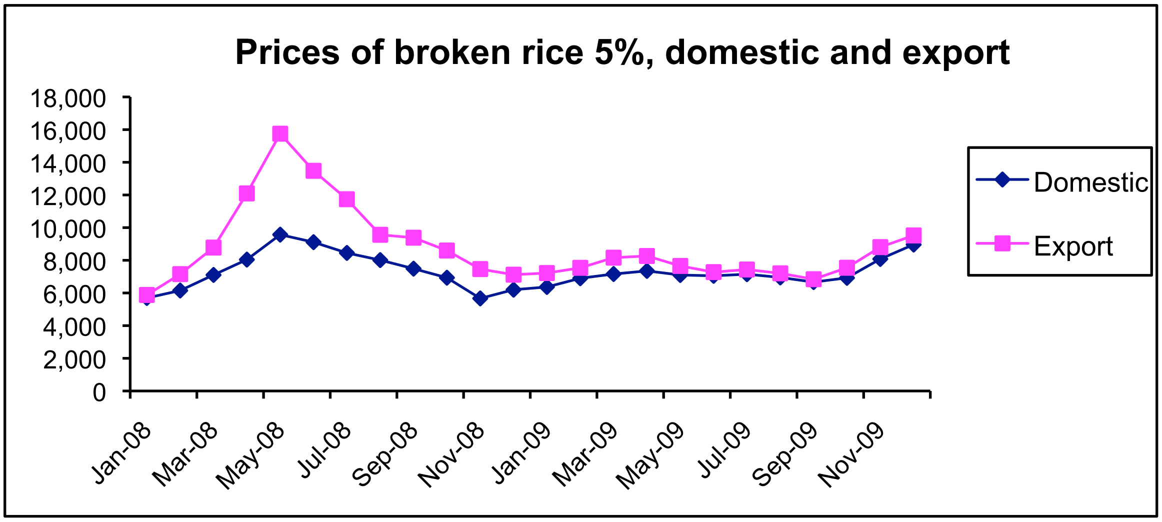

Figure 5. Vietnam: monthly rice prices in export and domestic markets, 2007:1–2009:12 (Source: MARD)

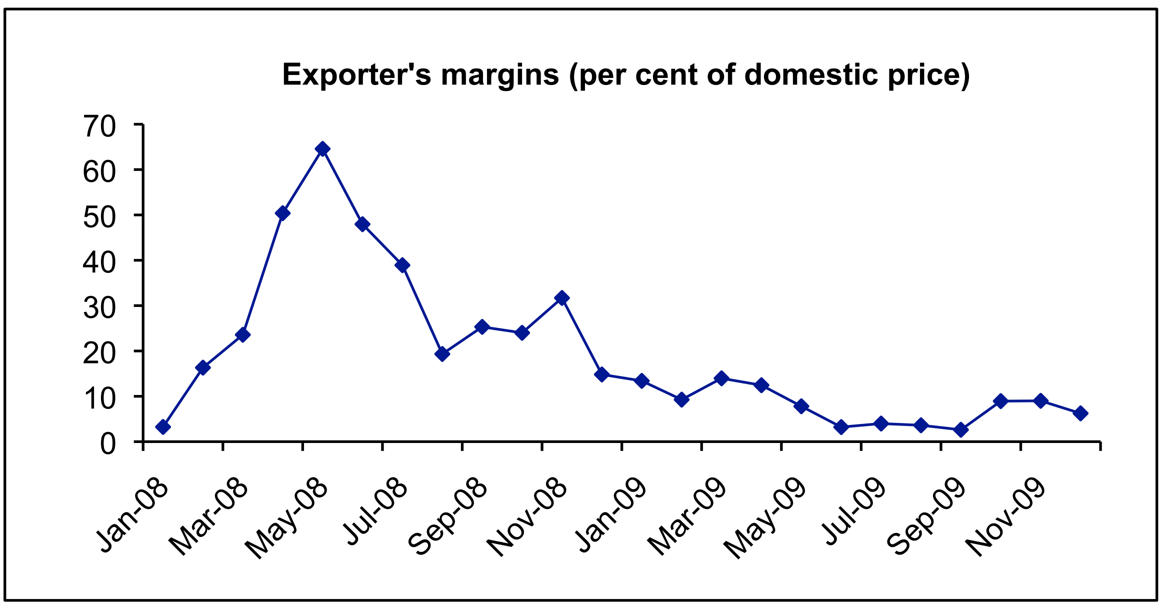

Figure 6. Vietnam: Rice exporters' margins (export price less domestic price)

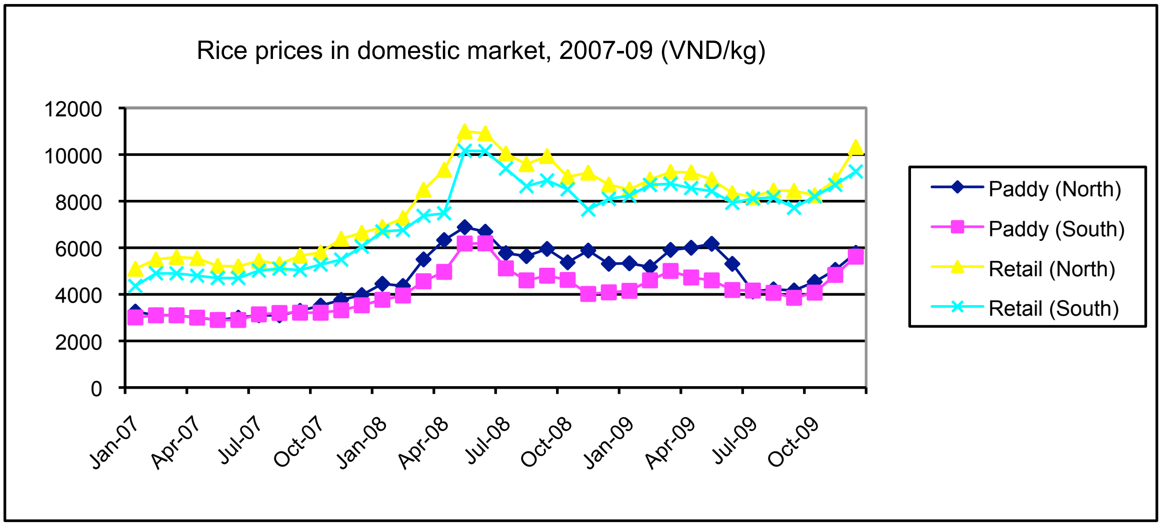

Figure 7. Vietnam: Paddy and rice prices (Source: MARD).

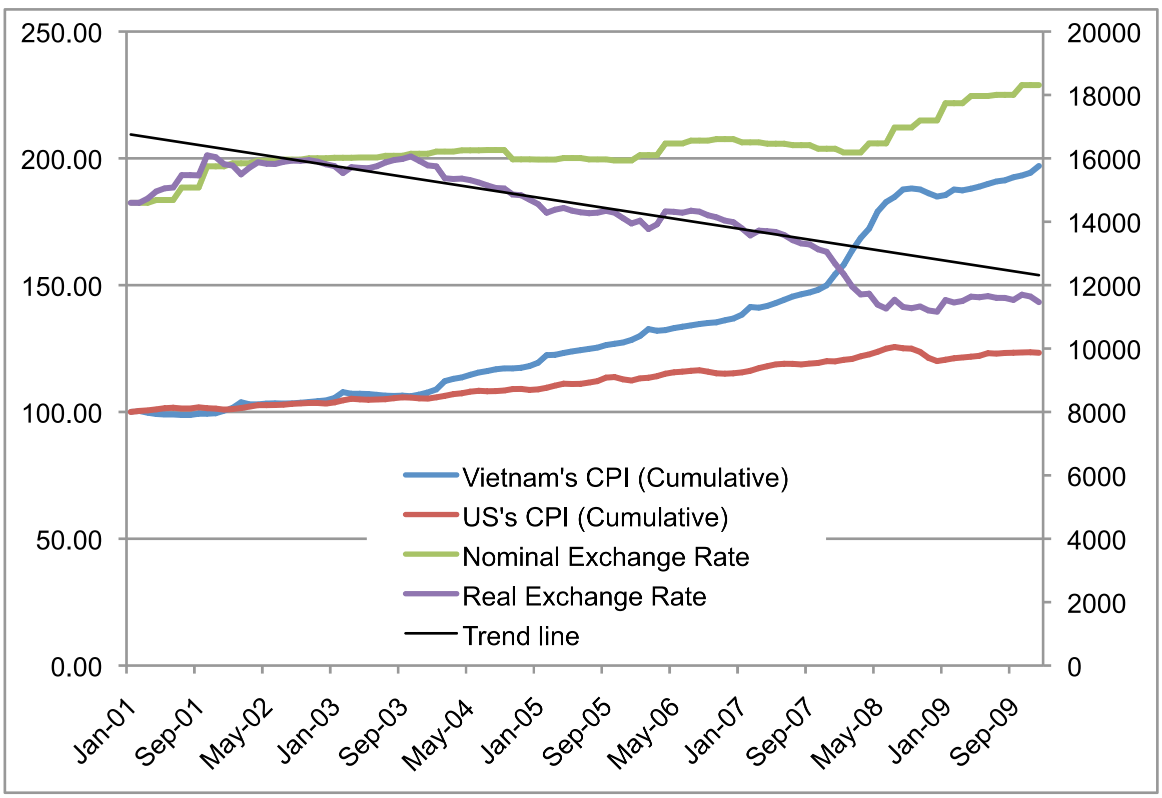

Figure 8: Nominal and real exchange rate trends (sources: IMF and GSO).