Agricultural Technology and Marketing Margins in Vietnam

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Abstract: This paper analyses the potential distributional impact and synergy effects from simultaneous improvements in agricultural sector productivity and reductions in trade and transportation margins. Two separate models are established to analyse (i) the interaction between agricultural technology and aggregate marketing margins in a Vietnamese context, and (ii) the relative importance of trade margins and transportation margins in explaining the importance of aggregate margins. The results show that a reduction in marketing margins is not a necessary complement for agricultural technology improvements to target welfare gains for rural households. Nevertheless, it remains a desirable complement since (i) it will allow for the reaping of significant synergy gains from interaction with agricultural productivity growth, and (ii) it will increase the targeting potential of agricultural productivity growth in terms of welfare improvements for poor rural households. Finally, the results show that a reduction in trade margins is a very potent instrument for reaping of synergy effects and targeting of rural household welfare. In contrast, transportation margins appear to be a surprisingly impotent instrument in these regards.

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1. Introduction

Vietnam has seen important reductions in poverty over recent years. Nevertheless, poverty remains an important issue in most rural areas as indicated by Jensen & Tarp (2005). While strong economic growth over the past decade has increased the income of many urban households, poverty remains widespread in rural areas. Most rural households rely on agricultural production for their livelihood. However, transformation of agricultural production practices in terms of adoption of improved varieties and modern production methods remains low (SEDP; 2006). Moreover, many rural households continue to face constraints in terms of market access, including difficulties in reaching markets where they can sell their crops and purchase intermediate inputs as well as high trading costs.

The current study seeks to shed light on the potential interaction between improvements in agricultural productivity and further development of physical transportation infrastructure and reductions in trading margins in rural and urban areas. Further development of the physical infrastructure is likely to reduce transportation margins for all sectors of the economy. Since marketing margins are typically higher for agricultural products compared to non-agricultural products, the induced reduction in marketing margins is likely to provide improved relative incentives for agricultural production. In particular, reduced marketing margins are likely to increase the benefits which can be obtained from increased agricultural productivity. Nevertheless, large transportation margins may not be the main problem in rural agricultural areas, since most areas in Vietnam have relatively easy access to road, rail or water transport services. Instead, trade margins may constitute a more serious constraint in terms of reaping the full potential gains from agricultural productivity growth. Accordingly, reductions in trade margins through improvements in market integration and market access (e.g. through legislative initiatives) may be a more potent instrument to lower marketing margins and reap synergy gains from agricultural productivity growth.

A reduction in marketing margins is akin to a reduction in technical input coefficients, and it is therefore likely to stimulate value added creation in the economy. Similarly, the improvement in agricultural productivity is modelled as a Hicks-neutral productivity increase, i.e. as an increase in

the scalar productivity parameter of each individual sectoral production function. The reduction in trade and transportation margins and the increase in agricultural productivity are therefore likely to lead to increased value added creation by themselves and together. This is to be expected. The focus of the analysis will instead be on (i) the interaction between agricultural technology and aggregate marketing margins in a Vietnamese context with a focus on sectoral and distributional issues, and (ii) the relative importance of trade margins and transportation margins in explaining the importance of aggregate margins.

The methodology of the current paper follows the methodology outlined in Arndt, Jensen, Robinson & Tarp (2000), where a static Computable General Equilibrium (CGE) model was applied to analyse agricultural technology and marketing margins in a Mozambican context. However, that paper did not distinguish between trade margins and transportation margins. A 2003 Vietnam Social Accounting Matrix (SAM), which was recently developed by Jensen & Tarp (2007), is used to calibrate two static CGE models for Vietnam, including a standard model with aggregate marketing margins and an extended model with separate trade margins and transportation margins. The two models are developed on the basis of a multi-sector version of the basic 1-2-3 model. The basic 1-2-3 model is described in Devarajan, Lewis & Robinson (1990), and the multi-sector version of the model is documented in Löfgren et al. (2001). The model specification of the multi-sector model (Löfgren et. al; 2001) is formally identical to the Mozambique model specification (Arndt, Jensen, Robinson & Tarp; 2000).

The remainder of the paper is structured as follows: Section 2 will briefly discuss the modelling methodology and present the 2003 Vietnam SAM data base; Section 3 will present the results of the agricultural technology and marketing margin experiments with the standard model (Section 3.1) and with the extended model (Section 3.2); Section 4 concludes.

2. Data and Model Methodology

The current analyses are based on the Computable General Equilibrium (CGE) modelling methodology. A static multi-sector CGE model of the 1-2-3 model type, as first described in Arndt, Jensen, Robinson & Tarp (2000) and later documented in Löfgren et al. (2002), is applied to

analyse the interactions between improvements in agricultural technology and marketing margins. It is a static model type, and it is therefore applicable for short- and medium-term analyses. This so-called 'standard model' is characterised by employing a Constant Elasticity of Substitution (CES) specification for production functions, and a Linear Expenditure System (LES) specification for household consumption demand covering home consumption of own production and marketed consumption. On the trade side, imperfect substitution between domestic production and imports are modelled through a CES specification (the Armington assumption), while imperfect transformation of domestic production into export goods is modelled through the use of a Constant Elasticity of Transformation (CET) specification.

Two separate models are applied including (i) the standard multi-sector model with one aggregate type of marketing services, and (ii) an extended multi-sector model which account separately for the use of trade services and transportation services. The extension of the standard model is useful for analysing the relative importance of trade margins and transportation margins in reaping the full benefits of policies directed towards increasing agricultural productivity. This is important since different types of policies are required to reduce respectively trade and transportation margins. Accordingly, transportation margins may be reduced through e.g. physical road investment, while reductions in trade margins may require legislative initiatives to increase competition and reduce red tape in the government.

The closure employed for the simulations in the next section, include fixed factor supplies and flexible relative factor prices (labour market closure)[2], fixed real government consumption, fixed real government transfers, and flexible government savings (government budget closure), fixed non-government institutional savings rates and flexible investment (savings-driven investment closure), and fixed foreign savings inflows combined with a flexible real exchange rate (external closure). In addition, flexible relative goods prices are allowed to clear the goods market.[3] While relative prices are used to clear markets, the absolute price level is not determined within the neoclassical model. The model therefore specifies the consumer price index for marketed goods as a price numeraire.

[2] Primary factor demand is flexible at the sector-level. The only exception is in the oil sector, where primary factor use is kept fixed since it is unlikely to respond to relative price changes in the short term. It follows that relative factor prices are allowed to vary in this specific sector.

[3] This closure is typically referred to as "the standard neoclassical closure" since relative prices clears all markets, including markets for goods, factors and foreign exchange.

Table 1. Production Characteristics of the Economy

Production Sector	VA share	EXP share	IMP share	EXP-OUT ratio	IMP-DEM ratio	DMRG-DOM ratio
Paddy	7.2%	0.0%	0.0%	0.0%	0.3%	2.2%
Other Crops	7.7%	5.4%	1.2%	47.1%	19.6%	3.8%
Livestock	3.4%	0.4%	0.1%	6.4%	1.3%	5.8%
Agricultural Services	0.6%					
Forestry	1.0%	0.0%	0.4%	1.2%	18.9%	9.4%
Fishery	3.8%	1.8%	0.0%	21.1%	0.9%	4.3%
Mining	1.5%	1.0%	0.5%	20.0%	13.2%	5.3%
Oil & Gas	10.2%	20.3%	0.1%	99.7%	66.8%	2.8%
Processed Sea Food	1.1%	6.7%	0.5%	81.8%	29.8%	4.3%
Processed Rice	0.7%	2.5%	0.0%	44.6%	0.1%	3.4%
Beverages	1.2%	0.1%	0.3%	2.2%	9.4%	1.1%
Tobacco	0.6%	0.6%	0.4%	23.6%	26.6%	3.4%
Other Processed Food	2.9%	2.4%	2.5%	13.4%	16.5%	2.4%
Glass & Ceramics	0.4%	0.8%	0.4%	40.5%	30.4%	6.3%
Building Materials	2.1%	0.1%	0.6%	0.7%	6.2%	5.6%
Paper	0.5%	0.3%	1.9%	11.4%	48.4%	4.3%
Wood	0.8%	3.5%	0.9%	81.6%	59.4%	4.6%
Chemicals	0.2%	0.1%	2.1%	8.1%	71.9%	3.1%
Fertilizer & Pesticides	1.0%	0.1%	2.6%	3.6%	47.2%	5.3%
Medicine	0.4%	0.2%	1.4%	12.7%	52.4%	4.3%
Rubber	0.6%	0.5%	0.8%	21.4%	32.3%	3.3%
Plastic	1.0%	0.8%	3.6%	16.5%	51.8%	3.8%
Other Chemical Products	0.7%	0.5%	2.8%	13.7%	52.5%	2.8%
Transport Equipment	3.4%	1.3%	7.1%	8.5%	39.8%	3.0%
Electrical Machinery	0.7%	2.0%	4.1%	41.3%	63.3%	3.2%
Other Machinery	1.2%	5.2%	16.7%	85.8%	95.6%	6.4%
Metals	1.0%	2.7%	11.8%	40.5%	78.1%	2.3%
Textiles	1.1%	0.9%	8.8%	12.6%	63.5%	1.7%
Clothes	1.9%	12.4%	1.6%	73.4%	31.1%	4.1%
Leather	1.4%	8.4%	2.9%	69.0%	48.5%	1.4%
Paper	0.5%	0.0%	0.1%	0.8%	4.0%	5.3%
Other Manufacturing	1.6%	1.4%	1.9%	16.2%	24.1%	3.0%
Gasoline	2.0%	2.9%	9.3%	49.2%	80.4%	
Electricity & Water	3.9%	0.0%	0.0%	0.0%	0.0%	
Construction	6.4%					
Trade	1.8%					
Hotels & Restaurants	2.3%	3.4%	1.6%	53.8%	38.4%	
Transport Services	2.4%	2.5%	3.1%	34.6%	42.6%	
Communication & Tourism	2.1%	1.9%	1.1%	46.6%	36.3%	
Financial Services	1.7%	2.0%	2.1%	57.8%	61.1%	
Science Services	0.9%	0.2%	0.4%	7.7%	17.4%	
Real Estate Services	2.8%	0.2%	0.6%	2.5%	8.9%	
State Services	3.1%					
Education	3.8%	2.4%	1.2%	30.6%	20.3%	
Health	1.7%	0.6%	0.7%	15.4%	21.1%	
Other Services	2.9%	1.5%	1.9%	28.4%	36.0%	
Total / Average	100.0%	100.0%	100.0%	30.4%	34.6%	2.7%

VA – value added; EXP – exports; IMP – imports; OUT – gross output; DEM – domestic demand/supply; DMRG – domestic marketing margins; DOM – domestically marketed production.

The calibration of the two models is based on a recently developed 2003 Vietnam SAM, which was developed by Jensen & Tarp (2007). The original SAM was aggregated from 112 production activities and retail commodities to 46 production and goods sectors. This aggregation was undertaken to facilitate analysis and reduce the amount of detail.[4] In addition, the SAM retains 14 primary factors of production, one enterprise sector, 16 household groups, one current government budget account and one rest of the world account (current account of the balance of payments). The four original capital accounts (including investment/stock changes in private/government sectors) were aggregated into two aggregate capital accounts including stock changes and investment expenditures. Finally, the original six trade and transportation margins accounts (categorised according to trade margins/transportation margins & exports/imports/domestically marketed production) were aggregated to three accounts (according to exports/imports/domestically marketed production) for the calibration of the standard CGE model, while the original six accounts were retained for the calibration of the extended CGE model. The full dimensions of the SAM(s) used for calibrating the CGE model(s) are outlined in appendix A.

The production structure of the Vietnamese economy, as derived from the 2003 Vietnam SAM, is presented in Table 1. The data shows that domestic oil and gas extraction continue to play a very important role in the creation of value added and the generation of foreign exchange earnings. Accordingly, oil and gas accounted for more than 10 percent of value added creation and more than 20 percent of export earnings in 2003. However, the downstream value chain remains virtually non-existent. Accordingly, the entire production of crude oil and natural gas was exported, while gasoline was imported to satisfy domestic demand.[5]

The primary agricultural sector remains another key production sector in the Vietnamese economy, accounting for 23.7 percent of value added creation. Primary agriculture only accounted for around 7.6 percent of export earnings in 2003, but it plays an important indirect part in the generation of export earnings, as a supplier of inputs into processed agricultural goods industries. Recent years has seen important progress in the development of downstream value chains, with a particular focus on export industries. This can be seen most clearly in the clothes, wood products and leather

[4] The reduced number of production sectors also improved the performance of the numerical solution algorithm (PATHC), which was employed to solve the GAMS program.
[5] Construction of an oil refinery is underway in ??, and the completion of this plant in 20?? is likely to significantly alter the economic impact of the oil and gas sector.

industries, which account for a combined 4.1 percent of value added and 24.2 percent of export earnings, and in the processed seafood and processed rice sectors, which account for a combined 1.8 percent of value added creation and 9.2 percent of export earnings. Export shares among these industrial sectors vary between 45 percent (processed rice) and 82 percent (processed seafood and wood products).

The combined service sector, including the education, health and state service sectors, account for 25.4 percent of value added creation. In addition, the service sector accounts for 14.7 percent of total export earnings. Service sector exports stem mainly from tourism, transport and hotel industries with export shares between 35 percent (Hotels & Restaurants) and 58 percent (Communication and Tourism) and with a combined 7.8 percent of total export earnings. However, service sector export earnings also stem from financial services (2.0 percent of total export earnings) with an export share of 58 percent.

Overall, the average export share is 30.4 percent. This covers a number of lightly traded primary agricultural and industrial sectors combined with a number of strongly traded processed agricultural industries and service sectors related to tourism.

Domestic marketing margin rates remain fairly low compared to other countries with a similar geographical nature. Vietnamese domestic margin rates range from 1.1 percent (Beverages) to 9.4 percent (Forestry) with an average margin rate of 2.7 percent. In contrast, Mozambican domestic margin rates range from 8.9 percent (Mining) to 302.5 percent (Cassava) with an average margin rate of 11.5 percent (Arndt, Jensen, Robinson & Tarp; 2000). Nevertheless, Vietnamese primary margin rates are higher than non-primary margin rates. Accordingly, all agricultural, forestry and fishery domestic margin rates (except paddy) remain compared to the average domestic margin rate.

Table 2. Scenarios

Scenarios	Description
Base Run	Base SAM data set for 2003
Scen. 1	Increase in productivity by 30 percent for all agricultural products
Scen. 2	Reduction in Marketing Margins by 15 percent for all goods
Scen. 3	Scen. 1 & Scen. 2 combined

3. Results

The overall interaction between agricultural technology improvements and marketing margins are analyzed through the implementation of a set of three scenarios. The three scenarios are outlined in Table 2, and they include a 30 percent productivity increase in every agricultural sector (scenario 1),[6] a 15 percent reduction in marketing margins across all agricultural and non-agricultural sectors (scenario 2), and a scenario which combines scenarios 1 and 2 (scenario 3).[7] The structure of these shocks allows for analyses of (i) the extent to which synergy effects may arise from simultaneous improvements in agricultural productivity and reductions in marketing margins, (ii) whether the distribution of household welfare will improve from individual and combined scenarios, and (iii) whether undesirable changes in the factor income distribution, which is likely to be the outcome of increasing agricultural productivity, may be avoided through simultaneous reductions in marketing margins. The impact of reductions in aggregate marketing margins will be studied in Section 3.1, while the impact of separate reductions in trade and transportation margins will be investigated in Section 3.2.

3.1 The standard model with aggregate marketing margins

This section analyses the impact of increased agricultural productivity and reductions in aggregate marketing margins on aggregate measures of income and welfare, as well as relative measures of goods and factor prices. The impact on selected macroeconomic indicators is presented in Table 3, and there are signs of non-linear synergy effects. The individual scenarios 1 & 2 lead to a combined 8.0 percent growth in GDP, while the combined scenario 3 leads to 8.2 percent growth. The synergy effect in value added creation is therefore positive and measure around 0.2 percent of base run GDP. While it may be considered small in absolute terms, it constitutes around 17 percent of the

[6] In this context, the forestry and fishery sectors are considered to be part of the primary agricultural sector.
[7] These shocks are similar to the shocks analysed for Mozambique in Arndt, Jensen, Robinson & Tarp (2000). In that study the two individual shocks (scenarios 1 & 2) gave rise to similar welfare effects. However, Vietnamese marketing margin rates are considerably smaller than Mozambican marketing margins, as noted in section 2. The individual shocks may therefore give rise to unbalanced welfare effects. Nevertheless, it was decided to retain the shocks of the original Mozambique study for comparative purposes.

total value added impact of reduced marketing margins.[8] The same picture emerges from the impact on aggregate welfare as measured by the growth in absorption. Reduced marketing leads to a 1.0 percent increase in absorption, while synergy effects amount to around 0.2 percent of absorption or 17 percent of the total welfare impact of reduced marketing margins. It follows that significant synergy effects in terms of value added creation and aggregate welfare may be reaped from reduced marketing margins when it accompanies improvements in agricultural productivity.

Table 3. Macroeconomic Indicators and Prices (percent)

	Base Run	Scen. 1	Scen. 2	Scen. 3
Real GDP (bio. VND)	613.4	6.9%	1.1%	8.2%
Absorption (bio. VND)	660.6	6.4%	1.0%	7.6%
Value Added price index	100	1.7%	1.2%	3.0%
Export producer price index	100	-1.4%	0.5%	-0.7%
Import purchaser price index	100	-0.7%	-0.5%	-1.1%
Cost of living index for rurals	100	-1.6%	0.2%	-1.4%
Cost of living index for urbans	100	0.1%	0.1%	0.2%
Real exchange rate index	100	-2.4%	0.0%	-2.2%
Ag. Terms of trade: Producer	100	-12.8%	1.2%	-11.6%
Ag. Terms of trade: Value Added	100	-19.9%	1.0%	-18.8%
Ag. Terms of trade: Export	100	-0.2%	0.2%	0.1%
Ag. Terms of trade: Import	100	0.4%	-0.6%	-0.3%
Price of commerce (domestic)	100	13.9%	-7.9%	5.3%

The results indicate that aggregate value added prices are likely to increase, both in response to individual scenarios as well as the combined scenario. However, the agricultural terms-of-trade also indicates drastic changes in relative value added prices. A 30 percent increase in agricultural productivity leads to a 19.9 percent drop in relative agricultural value added prices. This indicates that a large part of the welfare gains, associated with agricultural productivity gains, are transmitted from rural households to other household groups through reduced agricultural output prices. A 15 percent reduction in marketing margins may help to reduce the transfer of welfare away from rural households. However, Vietnamese marketing margins are relatively low, as observed in section 2. The potential for marketing margins to act as a mediator, to ensure that agricultural productivity

[8] In this respect, the Vietnamese synergy effects are relative higher compared to the synergy effects in the original Mozambique study where the GDP impact of reduced marketing amounted to 5.0 percent while the synergy effect amounted 0.4 percent.

gains mainly benefit the household groups which it is intended for, i.e. poverty-stricken rural agricultural households, is therefore limited. Accordingly, the reduction in marketing margins raises relative agricultural value added prices by a mere 1.0 percent, and the combined scenario shows little signs of non-linear synergy effects.

Declining agricultural value added prices reduce factor and household income in rural areas. However, declining agricultural prices also leads to a relative reduction in the Consumer Price Index (CPI) for rural households. Accordingly, the increase in agricultural productivity leads to a 1.6 percent reduction in the rural CPI, and a 0.1 percent increase in the urban CPI. The relative changes in CPI reflect different expenditure patterns between urban and rural households. Since agricultural expenditure shares are higher in rural households compared to urban households, rural households tend to benefit from reduced agricultural consumer prices. Accordingly, the large transmission of welfare gains to urban households, due to reduced rural factor prices, is partly offset by the accompanying relative reduction in agricultural producer prices (home consumption) and consumer prices (marketed consumption).

It may also be noticed that the reduction in marketing margins leads to a significant reduction in the price of commercial services. One of the main reasons for the transmission of welfare effects between rural and urban areas is that increased agricultural productivity leads to increased agricultural output and increased demand for commercial services. Since agricultural products have relatively high marketing margins compared to non-agricultural products (services face zero marketing margins by definition), it follows that the expansion of agricultural production has a particularly strong impact on the price of commercial services. However, the results indicate that the 13.9 percent commercial price increase associated with agricultural productivity improvements is reduced to less than half, i.e. a 5.3 percent price increase, if the productivity increase is accompanied by a 15 percent reduction in physical marketing margins. Moreover, the results show that important non-linear effects are at work. The individual scenarios 1 & 2 lead to a combined 6.0 percent price increase for commercial services, while the combined scenario 3 leads to a 5.3 percent price increase. It follows that one of the major underlying sources of aggregate synergy effects stems from the fact that reductions in marketing margins reduces the productivity-induced increase in demand for commercial services. The reduction in demand reduces the increase in the price of

commercial services, and this tends to increase productivity in other production sectors which use commercial services for marketing purposes.

Table 4. Equivalent Variation on Consumption

	Base Run (bio. VND)	Scen. 1	Scen. 2	Scen. 3
Household Rural Male Farmer Head	129.3	11.9%	1.4%	13.9%
Household Rural Male Self-employed Head	43.4	10.2%	1.4%	12.2%
Household Rural Male Wage-earner Head	24.7	12.2%	1.5%	14.5%
Household Rural Male Non-employed Head	0.6	1.2%	-0.3%	0.9%
Household Rural Female Farmer Head	26.8	11.1%	1.2%	13.0%
Household Rural Female Self-employed Head	9.5	9.9%	1.2%	11.7%
Household Rural Female Wage-earner Head	4.2	11.8%	1.3%	13.9%
Household Rural Female Non-employed Head	0.4	0.3%	-0.3%	0.1%
Household Urban Male Farmer Head	9.7	5.0%	0.0%	4.8%
Household Urban Male Self-employed Head	49.6	4.7%	0.4%	5.0%
Household Urban Male Wage-earner Head	43.5	3.5%	0.0%	3.3%
Household Urban Male Non-employed Head	1.4	-0.1%	-0.3%	-0.3%
Household Urban Female Farmer Head	5.1	4.3%	0.2%	4.4%
Household Urban Female Self-employed Head	31.6	4.0%	0.2%	4.0%
Household Urban Female Wage-earner Head	24.0	3.2%	0.0%	3.0%
Household Urban Female Non-employed Head	2.5	-0.3%	-0.2%	-0.4%

Measures of equivalent variation for the individual household groups are presented in Table 4. The results show that rural households (with employed heads) gain relatively strongly compared to urban households, both from the individual scenarios 1 & 2 as well as from the combined scenario 3. While productivity-induced reductions in value added prices (scenario 1) tend to transmit some of the welfare gains to urban households, the main part of welfare gains accrues to rural households. Accordingly, the 30 percent increase in agricultural productivity tends to raise the welfare of rural (employed) households by 10-12 percent while the welfare of urban (employed) households tends to grow by 3-5 percent. The fact that only a minor part of the welfare gains are transmitted away from rural households is due to the relatively low marketing margins which are characteristic of Vietnam. While the expansion in agricultural production raise the price of commercial services, the relative increase in the wedge between producer and consumer prices are limited by the small physical margin rates. Agricultural producers are therefore not constrained by large increases in marketing wedges, and they will therefore benefit relatively strongly from improvements in

agricultural productivity regardless of whether they are accompanied by marketing margin reductions.

The low initial level of physical marketing margins implies that existing marketing wedges are not a barrier for rural households to benefit from agricultural productivity growth. Nevertheless, the combined scenario does suggest that rural households may enjoy important positive synergy effects from simultaneous improvements in agricultural productivity and reductions in marketing margins. In particular, synergy effects add between 0.6-0.8 percent to the welfare gains of rural (employed) households. Accordingly, when 30 percent agricultural productivity growth is accompanied by a 15 percent reduction in marketing margins, this adds between 1.2-1.5 percent in direct gains and between 0.6-0.8 percent in indirect synergy gains to the welfare of rural households. Simultaneous improvements to agricultural technology and national marketing infrastructure may therefore raise the relative welfare of rural households quite strongly. It should be noted that some urban households (with non-employed heads) may experience reductions in welfare due to the increase in non-agricultural consumer prices. While these types of households make up a very small minority, the results do point to the potential need for accompanying household income transfers to ensure that all households will benefit.

Table 5. Components of Real GDP

	Base Run (bio. VND)	Scen. 1	Scen. 2	Scen. 3
Exports	366.6	2.0%	3.0%	4.2%
Imports	413.8	1.7%	2.7%	3.7%
Private Home Consumption	62.3	14.8%	0.7%	15.9%
Private Marketed Consumption	343.9	7.4%	0.9%	8.5%
Government Consumption	36.6	0.0%	0.0%	0.0%
Fixed Investment	204.6	3.8%	1.5%	5.3%
Stock Changes	13.1	0.0%	0.0%	0.0%
Real GDP	613.4	6.9%	1.1%	8.2%

The impact on the components of GDP is presented in Table 5. The results show that agricultural productivity growth and marketing infrastructure improvements stimulate foreign trade. Accordingly, the two foreign trade aggregates expand in line with each other, in each of the three

scenarios.[9] Interestingly, synergy effects have a negative impact on foreign trade, amounting to -0.8 percent for exports and -0.7 percent for imports. Nevertheless, the direct trade impact of reduced marketing margins is relatively strong, including a 3.0 percent increase for exports and a 2.7 percent increase for imports. Accordingly, the direct trade creating effect dominates the indirect trade retarding synergy effect of reduced marketing margins.

The results also indicate (somewhat surprisingly) that reduced marketing margins stimulate home consumption (+0.7 percent) and that synergy effects are positive both in terms of private home consumption (+0.4 percent) and private marketed consumption (+0.2 percent). Under normal circumstances, a reduction in marketing margins would be expected to increase the relative supply of marketed goods and reduce home consumption of own production. However, welfare gains from the reduction in marketing margins accrue mainly to rural (employed) households. Since home consumption (mainly primary agricultural or processed agricultural goods) constitutes a large share of the rural household budget, it follows that real home consumption must expand. Similarly, the positive synergy effects in terms of home consumption arise since the positive synergy effects on household welfare accrues mainly to (employed) rural households. Accordingly, rural households tend to spend a part of their (relatively large) welfare expansion on increased home consumption.

Table 6. Factor Prices

	Base Run	Scen. 1	Scen. 2	Scen. 3
Land	1	9.9%	2.9%	13.3%
Rural Labor (avg.)	1	12.0%	1.8%	14.8%
Urban Labor (avg.)	1	3.8%	0.0%	3.5%
Capital	1	6.8%	1.1%	8.0%

Finally, the impact on factor prices is presented in Table 6, and the results further supports the conclusion that agricultural productivity growth and marketing margin reductions benefits the rural agricultural sector. The 30 percent agricultural productivity increase gives rise to an average 12.0 percent increase in rural labor wages and a 9.9 percent increase in the returns to land. In contrast, the return to capital increases by 6.8 percent while urban labor wages increases by only 3.8 percent on average. These results show that the transmission of welfare effects to urban households is

[9] The real value of imports and exports must, by definition, expand or contract in line with each other, since the external closure of the model (flexible real exchange rate) implies that the trade balance is fixed in foreign currency terms.

relatively small. Accordingly, urban labor earnings and distributed profits constitute the main income sources for urban households, while rural labor earnings and returns on land accounts for the majority of rural household income.

While the welfare gains from increased agricultural productivity are transmitted mainly to rural households, accompanying reductions in marketing margins may allow important synergy effects to be reaped. The results indicate that the 15 percent reduction in marketing margins leads to a 1.8 percent average increase in rural labor wages, and a 2.8 percent increase in the returns to land. The returns to land increase relatively strongly since the land factor is specific to the agricultural sector. Marketing margins are higher (on average) in agricultural sectors compared to non-agricultural sectors (including service sectors). Reduced physical marketing margins therefore leads to particularly strong reductions in agricultural price wedges between consumer and producer prices. The reduction in price wedges raises relative agricultural value added prices (Table 3), and this benefits land owners. For the same reason, rural labor wages increase by 1.1 percent while urban labor wages are unchanged (on average). The return to capital increases by 1.1 percent.

Looking at the combined scenario 3 in Table 6, it follows that synergy effects are particularly important for the impact on rural labor wages. When reductions in marketing margins accompany policies to increase agricultural productivity, the impact of reduced marketing margins includes a direct effect of 1.8 percent and an indirect synergy effect of 1.0 percent. An accompanying policy to lower marketing margins will therefore allow the large potential synergy effects on rural household welfare to be fully reaped. It should be noted that negative indirect synergy effects on urban labor wages may arise. Nevertheless, the positive direct policy impact implies that the policy package does lead to an overall increase in urban labor wages and urban (employed) household welfare. Accordingly, if the policy goal is to improve the relative welfare of rural households, reductions in marketing margins may be used as an efficient tool in the reallocation of income and welfare.

In conclusion, reductions in marketing margins may be used for several purposes, including (i) to reap potential synergy effects in terms of value added creation and welfare, and thereby raise the impact of agricultural productivity growth to its full potential, and (ii) to achieve redistribution of income and welfare, and thereby target welfare growth for rural households. In this context, it should be noted that some minor households groups, including households with non-employed

heads, may experience declining welfare from the policy package. It should also be noted that the relative improvement in the institutional distribution of (household) income and welfare, is driven, to a large extent, by strong changes in the functional distribution of income, i.e. strong relative reductions in urban labor wages and returns to capital. Changes in the functional distribution of income are politically sensitive, and this may raise opposition to the implementation of this kind of policy package, unless it is implemented in combination with other policies which can counter-balance the impact on the functional income distribution.

Table 7. Scenarios

Scenarios	Description
Base Run	Base SAM data set for 2003
Scen. 1	Increase in productivity by 15 percent for all agricultural products
Scen. 2	Reduction in Trade/Transportation Margins by 30 percent for all goods
Scen. 3	Scen. 1 & Scen. 2 combined

3.2 The extended model with separate trade and transportation margins

This section analyses the impact of increased agricultural productivity when it is combined with respectively reductions in trade margins and transportation margins. The current analysis will focus on the (macroeconomic and household level) welfare impact of these separate types of marketing margins. However, reference will be made to underlying changes in GDP components and relative factor prices whenever appropriate. Since trade margins and transportation margins are relatively small, the relative size of the shocks has been changed to a 15 percent increase in agricultural productivity and a 30 percent reduction in trade margins resp. transportation margins. Table 7 provides a full description of the three scenarios which are analysed in the section.

Table 8. Macroeconomic Indicators and Prices (percent)
Trade Margin Experiments

	Base Run	Scen. 1	Scen. 2	Scen. 3
Real GDP (bio. VND)	613.4	6.9%	1.2%	8.4%
Absorption (bio. VND)	660.6	6.4%	1.1%	7.8%
Value Added price index	100	1.7%	1.4%	3.3%
Export producer price index	100	-1.5%	1.1%	0.0%
Import purchaser price index	100	-0.7%	-0.4%	-1.0%
Cost of living index for rurals	100	-1.6%	0.3%	-1.3%
Cost of living index for urbans	100	0.0%	0.2%	0.3%
Real exchange rate index	100	-2.4%	0.5%	-1.6%
Ag. Terms of trade: Producer	100	-12.9%	1.9%	-10.9%
Ag. Terms of trade: Value Added	100	-20.0%	2.0%	-17.8%
Ag. Terms of trade: Export	100	-0.2%	0.5%	0.3%
Ag. Terms of trade: Import	100	0.6%	-1.2%	-0.8%
Price of trade services	100	24.7%	-41.1%	-18.7%
Price of transport services	100	3.4%	1.5%	4.9%

The impact of increased agricultural productivity and reductions in trade margins on selected macroeconomic indicators is presented in Table 8, and they show signs of non-linear synergy effects in both value added creation and aggregate welfare. The individual scenarios 1 & 2 lead to a combined 8.1 percent growth in GDP and 7.5 percent increase in Absorption, while the combined scenario 3 leads to 8.4 percent growth in GDP and 7.8 percent growth in Absorption. The synergy effects associated with value added creation and aggregate welfare is therefore positive and the order of magnitude is similar to the aggregate marketing experiments in the previous section. Nevertheless, the synergy effects for both GDP and Absorption constitute around 27 percent of the direct effect associated with the reduction in trade margins. The relative size of these synergy effects are therefore much higher compared to the size of the macroeconomic synergy effects associated with aggregate margin reductions in Section 3.1. This seems to suggest that large synergy effects in terms of GDP and aggregate welfare can be reaped only when improvements in agricultural productivity is accompanied by reductions in trade margins.

Table 9. Equivalent Variation on Consumption
Trade Margin Experiments

	Base Run (bio. VND)	Scen. 1	Scen. 2	Scen. 3
Household Rural Male Farmer Head	129.3	11.8%	2.0%	14.9%
Household Rural Male Self-employed Head	43.4	10.1%	1.8%	13.0%
Household Rural Male Wage-earner Head	24.7	12.1%	2.1%	15.6%
Household Rural Male Non-employed Head	0.6	1.1%	-0.2%	1.0%
Household Rural Female Farmer Head	26.8	11.0%	1.8%	13.9%
Household Rural Female Self-employed Head	9.5	9.8%	1.6%	12.4%
Household Rural Female Wage-earner Head	4.2	11.7%	1.9%	14.8%
Household Rural Female Non-employed Head	0.4	0.3%	-0.2%	0.2%
Household Urban Male Farmer Head	9.7	5.0%	-0.5%	4.2%
Household Urban Male Self-employed Head	49.6	4.7%	0.1%	4.6%
Household Urban Male Wage-earner Head	43.5	3.6%	-0.6%	2.6%
Household Urban Male Non-employed Head	1.4	-0.1%	-0.3%	-0.2%
Household Urban Female Farmer Head	5.1	4.4%	-0.1%	4.1%
Household Urban Female Self-employed Head	31.6	4.0%	-0.2%	3.5%
Household Urban Female Wage-earner Head	24.0	3.2%	-0.5%	2.4%
Household Urban Female Non-employed Head	2.5	-0.4%	-0.1%	-0.3%

The impact of increased agricultural productivity and reductions in trade margins on the welfare of households is presented in Table 9, and the measures of equivalent variation again show signs of non-linear synergy effects. Focussing on rural (employed) households, the individual scenarios 1 & 2 lead to combined household welfare increases of 11.4-14.2 percent, while the combined scenario 3 leads to household welfare improvements of 12.4-15.6 percent. The synergy effects are very large and add between 1.0-1.4 percent to the welfare growth rates for rural (employed) households. This is significantly higher compared to the synergy effects recorded for household welfare calculations in the previous section. In particular, the synergy effects constitute between 53-66 percent of the direct effect associated with the reduction in trade margins. The relative size of these synergy effects is very high. It follows that improvements in agricultural productivity need to be accompanied by reductions in trade margins, if the full potential for increased rural welfare are to be reaped.

The other side of the coin is that transmission of welfare gains to urban households remains very limited. This may not be a problem, if focus is on relative welfare improvements for rural households. Nevertheless, it is interesting to notice that seven out of eight urban household groups experience declining welfare from a 30 percent reduction in trade margins. This suggests that trade margins represent a significant input cost and price wedge in rural areas, while it represents a significant source of income in urban areas. Within the current static medium-term framework, urban households may therefore experience declining welfare, since the reduction in demand for trade services pulls down non-agricultural value added prices and urban labor wages. Synergy effects are generally negative for urban (employed) households and range between 0.2-0.4 percent reductions in household welfare. The combination of negative direct and indirect effects of reduced trade margins is, however, dominated by the positive welfare impact of agricultural productivity growth. Accordingly, urban (employed) households may still experience an overall welfare gain of 2.4-4.6 percent from the combined policy package.

In general, it may be concluded that reductions in trade margins may be a very important instrument, in its own right, for targeting welfare improvements among poor rural households. Moreover, policies which are geared towards reductions in trade margins must represent an essential complement to policies which are geared towards increasing agricultural productivity. This would allow significant synergy effects to be reaped, both at the macroeconomic level in terms of value added creation and aggregate welfare growth, but also at the household level in order to reap the full potential for welfare improvements. The relative size of the synergy effects associated with reductions in trade margins is very large. It therefore seems that reductions in trade margins are more important for reaping welfare-related synergy effects, compared to reductions in transportation margins.

Table 10. Macroeconomic Indicators and Prices (percent)
Transportation Margin Experiments

	Base Run	Scen. 1	Scen. 2	Scen. 3
Real GDP (bio. VND)	613.4	6.9%	0.8%	7.8%
Absorption (bio. VND)	660.6	6.4%	0.8%	7.2%
Value Added price index	100	1.7%	0.8%	2.5%
Export producer price index	100	-1.5%	0.0%	-1.4%
Import purchaser price index	100	-0.7%	-0.5%	-1.1%
Cost of living index for rurals	100	-1.6%	0.1%	-1.5%
Cost of living index for urbans	100	0.0%	0.1%	0.1%
Real exchange rate index	100	-2.4%	-0.3%	-2.7%
Ag. Terms of trade: Producer	100	-12.9%	0.5%	-12.5%
Ag. Terms of trade: Value Added	100	-20.0%	0.2%	-19.8%
Ag. Terms of trade: Export	100	-0.2%	0.0%	-0.2%
Ag. Terms of trade: Import	100	0.6%	-0.2%	0.4%
Price of trade services (domestic)	100	24.7%	3.2%	27.6%
Price of transport services (domestic)	100	3.4%	-0.3%	3.1%

The impact of increased agricultural productivity and reductions in transportation margins on selected macroeconomic indicators is presented in Table 10, and they do indicate that synergy effects associated with value added creation and aggregate welfare are indeed much smaller compared to the synergy effects observed above. The individual scenarios 1 & 2 lead to a combined 7.7 percent growth in GDP and 7.2 percent increase in Absorption, while the combined scenario 3 leads to 7.8 percent growth in GDP and 7.2 percent growth in Absorption. The synergy effects are therefore positive but smaller in magnitude compared to the trade margin experiments and the aggregate marketing margin experiments in the previous section. Taking a closer look, the synergy effects for both GDP and Absorption constitute around 5 percent of the direct impacts associated with reductions in transportation margins. These results confirm that the relatively large synergy effects, in terms of GDP and aggregate welfare, which were identified in section 3.1, can be reaped only when improvements in agricultural productivity is accompanied by reductions in trade margins. In contrast, reductions in transportation margins do not seem to be particularly useful in reaping potential synergy effects associated with agricultural productivity growth.

Table 11. Equivalent Variation on Consumption
Transportation Margin Experiments

	Base Run (bio. VND)	Scen. 1	Scen. 2	Scen. 3
Household Rural Male Farmer Head	129.3	11.8%	0.7%	12.6%
Household Rural Male Self-employed Head	43.4	10.1%	0.9%	11.2%
Household Rural Male Wage-earner Head	24.7	12.1%	0.8%	13.1%
Household Rural Male Non-employed Head	0.6	1.1%	-0.3%	0.9%
Household Rural Female Farmer Head	26.8	11.0%	0.6%	11.8%
Household Rural Female Self-employed Head	9.5	9.8%	0.7%	10.7%
Household Rural Female Wage-earner Head	4.2	11.7%	0.8%	12.7%
Household Rural Female Non-employed Head	0.4	0.3%	-0.4%	0.0%
Household Urban Male Farmer Head	9.7	5.0%	0.4%	5.4%
Household Urban Male Self-employed Head	49.6	4.7%	0.6%	5.3%
Household Urban Male Wage-earner Head	43.5	3.6%	0.4%	4.0%
Household Urban Male Non-employed Head	1.4	-0.1%	-0.2%	-0.3%
Household Urban Female Farmer Head	5.1	4.4%	0.3%	4.7%
Household Urban Female Self-employed Head	31.6	4.0%	0.4%	4.4%
Household Urban Female Wage-earner Head	24.0	3.2%	0.4%	3.6%
Household Urban Female Non-employed Head	2.5	-0.4%	-0.3%	-0.6%

The lack of macroeconomic synergy effects carries over to the household level. Table 11 presents measures of equivalent variation for the individual household groups, and the numbers indicate that reductions in transportation margins lead to direct welfare increases of around 0.6-0.9 percent among rural (employed) households and around 0.3-0.6 percent among urban (employed) households. At the same time, synergy effects adds around 0.1-0.2 percent to welfare growth rates among rural (employed) households, while synergy effects are almost non-existing among urban household groups (a slightly positive synergy effect is recorded for the marginal group of non-employed female headed households).

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In general, it may be concluded that reductions in transportation margins has relatively low potential for targeting welfare improvements among poor rural households. Direct and indirect effects are relatively small and the overall impact is widely spread among rural and urban (employed) households. In particular, reductions in transportation margins do not allow for the significant potential macro-economic and household level synergy effects, which were identified in

the previous section, to be reaped. Policies geared towards increasing agricultural productivity should therefore be complemented with policies to reduce trade margins, in order to in order to reap the full potential for welfare improvements, and target welfare improvements among poor rural households.

4. Conclusion

This paper uses a Computable General Equilibrium (CGE) methodology to analyse the potential synergy effects which may exist between policies to increase agricultural productivity and reduce marketing margins. The study is based on a recently developed 2003 Vietnam Social Accounting Matrix (Jensen & Tarp; 2007), which accounts separately for trade margins and transportation margins. Accordingly, two different models were established to analyse (i) the interaction between agricultural technology and aggregate marketing margins in a Vietnamese context, and (ii) the relative importance of trade and transportation margins in explaining the importance of aggregate margins.

The results of the experiments with aggregate marketing margins are slightly at odds with previous results from Mozambique (Arndt, Jensen, Robinson and Tarp; 2000). The Vietnamese results indicate that important macroeconomic synergy effects exist in terms value added creation and welfare gains. Moreover, these gains are, to a very large extent, captured by the poor rural households. This conclusion differs from the Mozambique experience, where a large part of the aggregate welfare gains were transmitted to urban households through strong changes in relative prices. The reason for this difference is that Vietnam is characterised by relatively low one-digit aggregate marketing margins. Accordingly, the results indicate that a reduction in marketing margins is not a *necessary* complement for agricultural technology improvements to target welfare gains for rural households as is the case elsewhere. Policies to stimulate agricultural productivity growth will automatically target the welfare of rural households, since marketing constraints are fairly low in Vietnam.

While a reduction in marketing margins is not a necessary complement, the results do indicate that it is a *desirable* complement. When a reduction in marketing margins is designed to complement agricultural productivity growth, synergy effects are likely to amount to more than 25 percent of the

direct welfare impact of reduced marketing margins. Moreover, reduced marketing margins appear to be a very efficient instrument in targeting welfare improvements for rural households. Accordingly, synergy effects constitute between 41-54 percent of the direct impact on rural household welfare. In contrast, synergy effects are generally negative for urban households. Since all households (except the very minor group of urban households with a non-employed head) gain from the overall policy package, reductions in marketing margins seems to be a desirable complement to agricultural productivity growth. This is so since (i) it will allow for the full (synergy) gains of agricultural productivity growth to be reaped, and (ii) it will increase the targeting potential of agricultural productivity growth in terms of welfare improvements for poor rural households.

While reductions in marketing margins may be desirable for targeting welfare improvements for rural households, it may also have less desirable consequences in terms of changes to the functional distribution of income. Agricultural productivity growth targets the welfare of rural households since it stimulates the returns to rural agricultural production factors including land and rural workers. Accordingly, agricultural productivity growth may, by itself, unbalance the politically sensitive functional income distribution. A reduction in marketing margins may further add to this imbalance, since reduced marketing margins tend to benefit the returns to rural agricultural production factors as well. A reduction in marketing margins may therefore be a desirable complement to agricultural productivity growth as long as the reduction in the value added shares of urban labor and capital owners are not met by opposition.

In relation to the relative importance of trade margins and transportation margins, the results show that trade margins account for the vast majority of the synergy effects associates with reductions in aggregate margins. Reductions in transportation margins do have positive direct effects on household welfare. However, the effects are widespread among rural and urban households, and aggregate synergy effects from interaction with agricultural technology improvements amounts to less than 5 percent of the direct effects. Accordingly, reductions in transportation margins has little potential for (i) reaping of synergy gains from interaction with agricultural productivity growth, and for (ii) increasing the targeting potential of agricultural productivity growth in terms of welfare improvements for poor rural households.

The exact opposite holds true for reductions in trade margins. Reductions in trade margins have relatively strong macroeconomic synergy effects in terms of value added creation and welfare. In addition, these welfare gains are overwhelmingly captured by the poor rural households. Accordingly, synergy effects constitute 53-66 percent of the (relatively strong) direct impact of trade margin reductions on rural (employed) household welfare. It follows that reductions in trade margins is a very potent instrument in terms of (i) reaping of synergy gains from interaction with agricultural productivity growth, and in terms of (ii) increasing the targeting potential of agricultural productivity growth in terms of raising the welfare of poor rural households.

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Appendix A: Dimensions of the 2003 Vietnam Micro SAM (with 46 goods sector aggregation)

Table A.1. Dimensions

ACTIVITIES	G46A001	Paddy
	G46A002	Other Crops
	G46A003	Livestock
	G46A004	Agricultural Services
	G46A005	Forestry
	G46A006	Fishery
	G46A007	Mining
	G46A008	Oil & Gas
	G46A009	Processed Sea Food
	G46A010	Processed Rice
	G46A011	Beverages
	G46A012	Tobacco
	G46A013	Other Processed Food
	G46A014	Glass & Ceramics
	G46A015	Building Materials
	G46A016	Paper
	G46A017	Wood
	G46A018	Chemicals
	G46A019	Fertilizer & Pesticides
	G46A020	Medicine
	G46A021	Rubber
	G46A022	Plastic
	G46A023	Other Chemical Products
	G46A024	Transport Equipment
	G46A025	Electrical Machinery
	G46A026	Other Machinery
	G46A027	Metals
	G46A028	Textiles
	G46A029	Clothes
	G46A030	Leather
	G46A031	Paper
	G46A032	Other Manufacturing
	G46A033	Gasoline
	G46A034	Electricity & Water
	G46A035	Construction
	G46A036	Trade

	G46A037	Hotels & Restaurants
	G46A038	Transport Services
	G46A039	Communication & Tourism
	G46A040	Financial Services
	G46A041	Science Services
	G46A042	Real Estate Services
	G46A043	State Services
	G46A044	Education
	G46A045	Health
	G46A046	Other Services
COMMODITIES	G46C001	Paddy
	G46C002	Other Crops
	G46C003	Livestock
	G46C004	Agricultural Services
	G46C005	Forestry
	G46C006	Fishery
	G46C007	Mining
	G46C008	Oil & Gas
	G46C009	Processed Sea Food
	G46C010	Processed Rice
	G46C011	Beverages
	G46C012	Tobacco
	G46C013	Other Processed Food
	G46C014	Glass & Ceramics
	G46C015	Building Materials
	G46C016	Paper
	G46C017	Wood
	G46C018	Chemicals
	G46C019	Fertilizer & Pesticides
	G46C020	Medicine
	G46C021	Rubber
	G46C022	Plastic
	G46C023	Other Chemical Products
	G46C024	Transport Equipment
	G46C025	Electrical Machinery
	G46C026	Other Machinery
	G46C027	Metals
	G46C028	Textiles
	G46C029	Clothes
	G46C030	Leather

	G46C031	Paper
	G46C032	Other Manufacturing
	G46C033	Gasoline
	G46C034	Electricity & Water
	G46C035	Construction
	G46C036	Trade
	G46C037	Hotels & Restaurants
	G46C038	Transport Services
	G46C039	Communication & Tourism
	G46C040	Financial Services
	G46C041	Science Services
	G46C042	Real Estate Services
	G46C043	State Services
	G46C044	Education
	G46C045	Health
	G46C046	Other Services
MARGINS[a]	G46TRDEXP	Export Trade Margins
	G46TRDIMP	Import Trade Margins
	G46TRDDOM	Domestic Trade Margins
	G46TRNEXP	Export Transportation Margins
	G46TRNIMP	Import Transportation Margins
	G46TRNDOM	Domestic Transportation Margins
FACTORS	G46F01	Land
	G46F02	Labour Rural Male Uneducated
	G46F03	Labour Rural Male Medium Education
	G46F04	Labour Rural Male High Education
	G46F05	Labour Rural Female Uneducated
	G46F06	Labour Rural Female Medium Education
	G46F07	Labour Rural Female High Education
	G46F08	Labour Urban Male Uneducated
	G46F09	Labour Urban Male Medium Education
	G46F10	Labour Urban Male High Education
	G46F11	Labour Urban Female Uneducated
	G46F12	Labour Urban Female Medium Education
	G46F13	Labour Urban Female High Education
	G46F14	Capital
ENTERPRISES	G46E	Enterprise
HOUSEHOLDS	G46H01	Household Rural Male Farmer Head
	G46H02	Household Rural Male Self-employed Head
	G46H03	Household Rural Male Wage-earner Head

	G46H04	Household Rural Male Non-employed Head
	G46H05	Household Rural Female Farmer Head
	G46H06	Household Rural Female Self-employed Head
	G46H07	Household Rural Female Wage-earner Head
	G46H08	Household Rural Female Non-employed Head
	G46H09	Household Urban Male Farmer Head
	G46H10	Household Urban Male Self-employed Head
	G46H11	Household Urban Male Wage-earner Head
	G46H12	Household Urban Male Non-employed Head
	G46H13	Household Urban Female Farmer Head
	G46H14	Household Urban Female Self-employed Head
	G46H15	Household Urban Female Wage-earner Head
	G46H16	Household Urban Female Non-employed Head
GOVERNMENT	G46GOV	Government Current
	G46ATAX	Production Activity Tax
	G46STAX	Retail Commodity Sales Tax
	G46TAR	Import Tariffs
	G46YTAX	Direct Taxes
CAPITAL	G46DSTK	Aggregate Inventory Acocunt
	G46S-I	Aggregate Capital Account
REST OF THE WORLD	G46ROW	Rest of the World
TOTAL	G46Total	Total

[a] Margins accounts are aggregated to three aggregate trade and transportation margins accounts for the calibration of the standard CGE model.