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## Impact Assessment of National and Regional Policies Using the Philippine Regional General Equilibrium Model

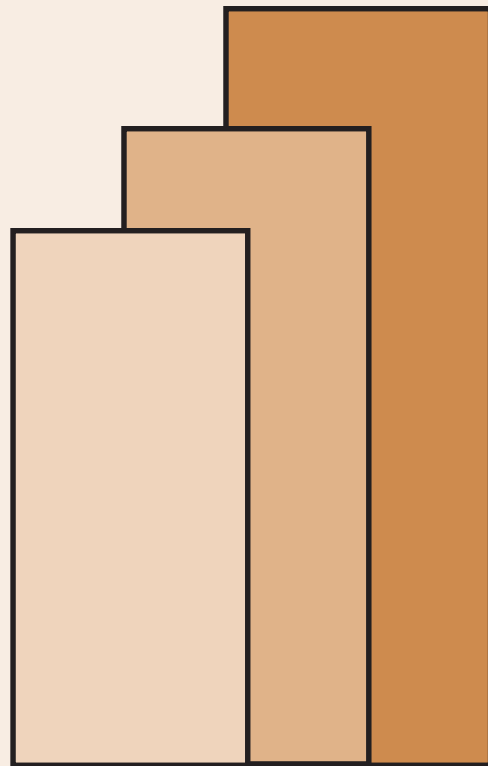
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**FINAL REPORT**

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**Impact Assessment of National and Regional Policies using the  
Philippine Regional General Equilibrium Model (PRGEM)**

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## **Summary**

For the Philippines, quantitative policy analysis should incorporate regional differences in welfare and economic structure, which arise partly from geographic constraints. However, existing CGE models offer limited analysis of regional effects or national impacts of region-specific interventions, owing to the absence of key regional data. This study formulates a regional CGE model that overcomes these limitations. Applications of the model yield the following results: i) completion of the tariff reform program in agriculture will contract some import-competing sectors in lagging regions, but improve welfare across all regions; ii) massive investments in marketing infrastructure promise bigger pay-offs, though with a trade-off between the size and spread of welfare gains across regions; iii) combining trade reform with marketing infrastructure investments mitigate some of the contractionary effects from the former; however the absence of welfare synergies suggest that the two sets of policies can be pursued independently.

**Keywords:** computable general equilibrium, regional economics, agricultural development, marketing infrastructure, trade liberalization, welfare impact

**JEL codes:** C68, M390, Q180, R130, R580

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## 1. Introduction

For the Philippines (as in many other countries), a regional perspective is essential to the formulation of a national development policy. Eradication of mass poverty remains the paramount policy goal, as the official headcount ratio hovers at 32.9%. However there are large disparities across the country's regions. Poverty incidence among the main island groupings soars to as much as 45.5% for Mindanao (Southern Philippines), followed by Visayas (Central Philippines) at 39.8%. In contrast, poverty incidence in Luzon (Northern Philippines), which hosts the national capital, is only 25.3%, based on National Statistical Coordination Board (NSCB) data (NSCB, 2008a).

Moreover, regions differ in economic structure: the share of agriculture in GDP approaches two-fifths in Mindanao, about one-fifth in Visayas, but only one-seventh in Luzon. However industry accounts for 35% of GDP in Luzon, but only 28% in Mindanao (NSCB, 2008b). The different regions may therefore play different roles in the national economy: Executive Order 561 frames public investment policies in terms of "super-regions," based on the principle of bolstering the "natural advantages of five distinct sub-economies of the country".

Economic differences are due to the country's geography and uneven historical patterns of development. The Philippines is an archipelago of over 7,000 islands and mostly mountainous topography (though on the larger islands there are narrow valleys and alluvial plains.) Forming linkages across locations separated by seas and rough terrain is difficult. The country's logistics system remains a stumbling block to market efficiency. Poor roads, inadequate transportation systems, and inadequate storage and warehousing facilities lead to damage, shrinkage and deterioration in the quality of farm products, as well as higher agricultural prices (Ordoñez and Associates, 2005). On the other hand, regions with a better stock of infrastructure tend to have faster regional GDP growth (Llanto, 2007).

Regional development seeks to address disparities in living standards across regions, as well as differences in welfare outcomes of various economywide policies. The major research questions include the following:

- a) What are the regional differences in impacts for economywide policies?
- b) What are the economywide implications of regional development policies?

These questions may be asked for policy and investment options, singly or in combination. For the latter, impact analysis can help illuminate issues of complementarity or synergy between economywide and region-specific policies.

Impact analysis for various sectoral or economywide policies have been conducted for the Philippines using computable general equilibrium (CGE) models. Applications range from agricultural policy reforms (Habito, 1986); productivity growth in manufacturing (Bautista, 1988); environmental impacts of tax and trade policies (Coxhead, 1995; Inocencio, Dufournaud, and Rodriguez, 2001). More recent work involves tariff reduction (Cororaton, 2004), and World Trade Organization (WTO) reforms (Cororaton, Cockburn, and Corong, 2006; Cororaton and Cockburn, 2006). However regionally disaggregated analysis is rare; where this is possible (e.g. the TARFCOM model), the disaggregation is performed in an *ad hoc* fashion. The preceding research questions therefore cannot be satisfactorily addressed by the existing models.

This study presents a regional CGE model that can address these research questions. This is the first such model which adopts standard features of Philippine CGEs, using relatively recent (2000) data. The model is applied to policy experiments involving tariff reform, as well as region-specific investments in logistics and marketing infrastructure. The rest of this paper is structured as follows: Section 2 reviews the literature covering the major policy and modeling approaches; Sections 3 and 4 respectively discuss the model and data, while Section 5 applies the model and discusses implications for the country's regional and national development policy. Section 6 summarizes and concludes with directions for future work on regional CGE modeling.

## **2. Policy and modeling issues**

### **2.1. The regional dimension of Philippine development**

#### *Regional differences*

The three island groups can be divided into 16 administrative regions, which also exhibit differences in welfare and economic structure (Table 1). The National Capital Region (NCR) has more than double the country's per capita GDP; the other regions are near or below the national average. NCR, together with the adjacent Southern Tagalog

region, account for only 28% of the population, but combine for 45% of national GDP. NCR is also the least poor region. In general there is a tendency for regions with lower per capita GDP to display a higher incidence of poverty. Similarly the regions with lower per capita GDP tend to produce a greater share of regional output from agriculture, pointing to differences in economic structure across the regions. Nationally, agriculture still employs 37% of the country's workers, based on National Statistics Office (NSO) data (NSO, 2008); however, it contributes only 18.8% of national GDP. This highlights the sector-specific dimensions of low labor productivity and (by implication) poverty. If employment in agroprocessing and agribusiness activities is combined with basic agriculture, the agri-based economy can account for as much as 40% of GDP and up to two-thirds of employment (Habito and Briones, 2005).

[TABLE 1 HERE]

#### *National policy and regional economies*

Postwar economic policy was dominated by industrialization based on import substitution, imposing an implicit tax burden on agriculture (Intal and Power, 1991). The emphasis on heavy industries inadvertently promoted capital-intensive manufacturing located in cities. Pernia, Paderanga, and Hermoso (1983) found that concentration of economic activities around the national capital was positively associated with effective protection rates. From the 1980s this protectionist stance was dismantled through a series of structural adjustment programs. In foreign trade, major reforms have been the elimination of export taxes, the repeal of most quantitative restrictions, and tariff reduction. Subsequently in the 1990s manufacturing became less concentrated in NCR, though the shift went mostly the regions adjacent to the capital (Tecson, 2007).

Even as industry protection declined during the reform period, that of agriculture rose dramatically, particularly with after the WTO accession in 1995 (David 2003). There remains a strong political resistance towards further trade liberalization in agriculture. Opponents are wont to cite the potentially adverse impact on foreign competition on small farmers and the rural poor, as well as the inadequacy of government support for building a globally competitive agricultural sector. More recently, Cororaton, Cockburn,

and Corong (2006) find that tariff reduction improves overall welfare but worsens poverty. This seems to support the contention that “opening national agricultural markets to international competition before basic market institutions and infrastructure are in place can undermine the agriculture sector with long-term negative consequences for poverty and food security” (Food and Agriculture Organization, 2005). Conversely, Bautista and Robinson (1997) showed that trade restrictions partly obviate the favorable effects of technological change in agriculture.

Studies have uncovered some degree of market disintegration in agriculture owing to geographic barriers, at least in the short run. Agricultural markets do tend to be integrated in the long run (Silvapulle and Jayasuriya, 1994; Coxhead et al, 2001); for corn, market imperfections have been found to slow down the adjustment of regional prices to the market center in the national capital. These imperfections may be related to high transport costs and inadequacy of inter-island shipping vessels (Mendoza and Rosegrant, 1995). As commodities are more mobile than production factors, there is every reason to suspect that geographic barriers are even more formidable for factor movement, especially of labor. One may in fact model the different regions as having different labor markets, each with its distinctive features such as rate of adjustment to equilibrium (Montalvo, 2006). Adjustment problems in the geographically-disadvantaged regions may be one factor behind the failure of the country to respond to economywide policy reforms.

National policy, expressed in recent economic plans, has highlighted the need to reduce development disparities between the regions. The current administration highlights “decentralized development” as one of its 10 basic goals. Decentralization is seen not only as the ends, but also the means towards economic development: since 1991 the government has largely devolved various government functions to local governments. Within this set-up, the regions provide the natural zone of convergence between regional and national government development strategies. Several mechanisms are in fact in place to promote coordination, such as the Regional Development Councils. The need to diversify infrastructure locations away from the highly congested capital is also highlighted (National Economic Development Authority, 2004).

Moreover, national policy recognizes modernization of agriculture as a precursor of regional development. Agricultural modernization entails an effective system of technology transfer, capital assistance and agricultural marketing services to the agriculture-dependent regions. Also essential would be public investments in irrigation and postharvest facilities. This would also require large public investments in quality transport infrastructure, including roads and shipping facilities, as well as regulatory reforms in transport services (Intal and Ranit, 2004).

Quantitative simulations using an explicit regional model are useful when the regions differ in household welfare and dependence on agriculture. National-to-subnational analysis would focus on disaggregating the regional impact of economywide reforms, such as trade liberalization in agriculture. Meanwhile subnational-to-national analysis can help formulate regional priorities for public investments in market infrastructure, to improve economic linkages between regions. Finally, regional CGEs can illuminate the degree of complementarity between policies, such as combining trade liberalization with public investment biased towards disadvantaged areas. These issues would guide our later formulation of the scenarios for quantitative analysis (Section 5).

## **2.2. Regional CGE models**

### *Top-down versus bottom-up approaches*

The formulation of regional CGEs confronts two options. The first is the “top-down” approach, in which the national economy is modeled as a single economic system, with regional outcomes computed by some disaggregation method. The other is the “bottom-up” approach, in which each regional economy is modeled as distinct economic system (allowing for interactions in a single national market). For instance, Brocker and Schnedier (2002), collapse all external output (foreign goods and goods from other regions) into a single constant elasticity of substitution (CES) pool. The top-down approach is clearly simpler, but misses out on the richness of inter-regional and intra-regional market interactions that can be captured in the bottom-up approach. Between these two extremes are “hybrid” approaches e.g. the Monash – MRF (Peter et al, 1996).

Few regional CGEs have been constructed for the Philippines. One of the more recent ones is the TARFCOM model (Cabalu et al, 2001), which is patterned after



Australia's ORANI-G model. Regional breakdowns are top-down; this reflects the constraints to bottom-up regional modeling, mainly due to the absence of data on interregional flows of goods and services (Yap, 2001).

### *Geography and regional economies*

Introducing the regional dimension leads us inexorably to the realm of geography. Partridge and Rickman (1998, 2008) note that most regional CGEs adopt the framework of trade models. Essentially such models abstract from the physical geography of the regional units. At the frontier of this line of research are models that make the geographic element explicit and fairly detailed, i.e. spatial CGEs that account for distance and transport costs, or CGEs that endogenize the location of economic actors (producers or consumers). Spatial patterns of economic activity – namely agglomeration effects – typically entail increasing returns technology, whether external to producers, or internal to producers (as in the “new economic geography”). Such assumptions however introduce serious complications in analytical tractability.

For the Philippines a spatial CGE model has been developed by Mizokami, Itose, and Dakila (2005), and extended in Dakila and Mizokami (2006a). The model aims to analyze the impact of reducing “impedance”, a measure of the transport network congestion. Their model has seven sectors, namely agriculture, industry, other services, air transport services, water transport services, land transport services, and government services. Four institutions are represented, namely households, firms, government, and the foreign sector. Households are disaggregated into three groups per region, based on income bracket. Production and consumption are represented by Cobb-Douglas functions. Imports and exports are exogenous – a nontrivial simplification. Given its analytical novelty, it is clear that standardized techniques for geographically explicit models are still being developed. . The model uses regional Social Accounting Matrices (SAMs) based on 1994 data, which capture intraregional and interregional flows. Construction of the data set is described in Dakila and Dakila (2004) and Dakila and Mizokami (2006b).

For the regional CGE model adopted in this study, we take the bottom-up approach as most appropriate for modeling the policy issues being tackled, i.e. distinct

inter- and intra-regional interactions created by cross-regional rigidities in the movement of goods, services, and factors. However, we adhere to the analytically tractable trade-modeling approach. Economic flows such as consumption, production, interregional and international trade, will all be modeled using price responsive, conventional functional forms.

### 3. Model

The outline of the basic CGE model (*sans* the regional extension) follows that of the PhilCGE of Habito (1986), an adaptation of Dervis, de Melo, and Robinson (1982), and updated by Briones (2005).

#### 3.1. Categories

We develop a static, constant returns, competitive, and market-clearing regional CGE of the Philippines. The regional and sectoral structure was designed in consultation with development officials in the NEDA. The sub-national classification is based on the official super-regions.<sup>1</sup> The *regions* or sub-national economies are defined as follows:

1. Northern Luzon (Ilocos, CAR, Cagayan Valley) - *MLuz*
2. Metro Luzon (Central Luzon, Southern Tagalog, and NCR) - *Oluz*
3. Central Philippines (Bicol region, and all the Visayas regions) – *Vis*
4. Mindanao (all the Mindanao Regions).- *Minda*

Because of serious data limitations in the construction of regional SAMs, the model adopts a minimalist classification of sectors, while transcending the basic sector subdivision into agriculture, industry, and services. That is, the number of sectors should be minimized, subject to the following: a) categories should support the analytical thrusts of the study, namely the focus on agriculture and interregional trade; b) there may be a basic split each for Industry and Services, but more detailed disaggregation for Agriculture; c) as much as possible, resulting sectors should exhibit product

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<sup>1</sup> The official super-regions are: i) Northern Luzon Agribusiness Quadrangle (Regions I, II, CAR, northern Aurora province, northern Tarlac province, northern Nueva Ecija province, and northern Zambales province); ii) Luzon Urban Beltway (NCR, Region IV-A, southern provinces in the first superregion, and the provinces of Tarlac, Zambales, Aurora, and Nueva Ecija; iv) Central Philippines (Region V, IV-B, and the Visayas); v) Agribusiness Mindanao (Mindanao except Camiguin); vi) Cyber-Corridor (not geographically defined). Data constraints (e.g. no provincial data on economic aggregates) preclude a perfect correspondence with the official definitions; the model regions represent the best approximation while maximizing the use of data.

differences across categories, but similarity within one category. The resulting disaggregation is as follows:

1. Cereals - *Cereals*
2. Livestock and Poultry - *Lvpoul*
3. Fisheries - *Fish*
4. Other agriculture - *Othagri*
5. Agro-processing (Food, beverage, and tobacco manufacturing) - *Agroproc*
6. Other industry - *Othind*
7. Trade, Transport and Storage Services - *Trans*
8. Other services - *Othserv*

Sectors 5 and 6 is the basic Industry split, between the agro-industry and other industry. Sector 7 and 8 is the basic Services split, distinguishing between distribution and marketing, and other services. Sectors 1 to 4 are the agricultural sectors, which distinguish between non-crops and crops; the non-crops are split into terrestrial and aquatic sectors, while within the crops sector, cereals (mostly rice and corn) are distinguished from other crops. The separate treatment of cereals reflects policy priorities (World Bank, 2007), their status as staples, and their importance to crop agriculture. In 2006, rice and corn account for 52% of total crop area and nearly half the value of total crop production (BAS, 2008). Figure 1 charts the production value shares of each of the agricultural sectors. Unavoidably, there are three residual sectors, which are actually heterogeneous, namely: non-cereal crop agriculture, industries other than agro-processing, and services other than marketing and distribution.

[FIGURE 1 HERE]

As usual there will be four institutions: firms, government, the foreign sector, and households. Currently there is one household per region (though the model is formulated to accommodate multiple households per region). Model definitions and equations are shown in Annex 1.

### **3.2. Demand**

The components of domestic absorption are: household consumption, government consumption, investment demand. In each region and sector, household consumption is characterized by a linear expenditure system (LES). Household expenditure is a fixed

proportion of disposable income, leaving household savings as the remainder. Disposable income is factor income after tax, plus net transfers to households. Factor income is earned from the fixed labor and capital endowment by region, i.e. factor immobility is imposed.

Government consumption is a fixed share of an exogenous national budget, i.e. public sector demand is Cobb-Douglas. Tax revenues are collected directly from factor owners, and indirectly from businesses and importation. Revenues plus government transfer receipts, less total spending inclusive of exogenous transfer payments, yields government savings. Equations for total imports and exports lead to foreign savings. Total savings sum up the savings from various sources.

Demand by institutions within a region or internal demand consists of final and intermediate demand. Computation of demand for sector Trans has an extra term, signifying the marketing input from Trans to conduct inter-regional trade. Investment demand by sector and region is a fixed proportion of regional savings. Internal demand plus demand from other regions yields total demand.

### **3.3. Production**

Production follows a CES technology combining primary factors labor and capital. We include a productivity parameter  $\lambda$  set to 1 at the baseline; a higher value of  $\lambda$  allows more output to be produced with the same quantity of primary factors. Demand for intermediate inputs is derived from Leontieff technology: price of value added is computed from gross output price by subtracting unit intermediate inputs; unit intermediate inputs multiplied by gross output levels equals total intermediate demand.

### **3.4. Inter-economy and closure**

The inter-economy structure of the model is schematically represented in Figures 2 and 3. The former represents the demand side, which is a nested CES formulation Total demand is internal demand plus demand *from* other regions. Internal demand is a CES composite, combining demand for goods produced outside the region, and demand for own production, or *home* demand. External demand is a CES composite of the aggregate regional good, and imports; finally, the regional good is a CES composite of goods produced in other regions. Meanwhile for the supply side (Figure 2), total gross output is the simple sum of what is supplied to other regions, along with the remainder of gross

output. The latter in turn is a CET composite of home production and production for exports. For either side of the market, the world price is fixed (i.e. the Philippines is a small open economy).

The price of the aggregate regional good is a composite of the demand prices charged by the other regions, with an adjustment for a unit transaction cost. This transaction cost set-up resembles that of the “standard CGE” model of the International Food Policy Research Institute (Lofgren, Harris, and Robinson, 2002). The CES composite of the aggregate regional good yields derived demands for the outputs of the other regions. This demand, along with unit transaction cost, generates the demand to meet the transaction requirements of inter-regional trade, whose price is that of sector Trans.

Closure is imposed by relating market to demand price, equilibrium in the markets for primary factors by region, and equating demand and supply for the home good by region; a flexible exchange rate (consistent with the policy regime in the last two decades) is implemented at the supposed equilibrium capital outflow or foreign savings. As system equilibrium is homogenous of degree zero in all prices, normalization is required to obtain a unique solution; this is imposed by setting the market price index to its baseline value.

[FIGURE 2 HERE]

[FIGURE 3 HERE]

## **4. Model data and calibration**

### **4.1. Regional SAMS**

The biggest challenge for constructing a regional CGE is building the regional SAMS, which comprise the base data set of the CGE. Some of the methods follow Dakila and Dakila (2004). Data is mostly obtained from official sources, particularly the National Statistics Office (NSO). The regional SAMS are constructed in a series of steps. Figure 4 provides a schematic representation of these steps; oval shapes represent official data sources, rectangles represent processed data, while block arrows represent other sources of information, i.e. literature review, and computational procedure (RAS).

[FIGURE 4 HERE]

**a) Construct a national SAM**

First we construct a national SAM based on our eight economic sectors, and without interregional trade (Table 2). The national SAM is primarily based on the 2000 Input-Output table (the most recent available). Transfer items are computed from the 2000 National Income Accounts. The one missing piece of information is tariff revenue. We requested estimates of weighted tariff rates from the Tariff Commission, based on the 8-sector definition for the year 2000. Finally, savings is computed as a residual to balance the SAM.

[TABLE 2 HERE]

**b) Compile regional spending data**

Next we compile regional accounts data, from the Gross Regional Domestic Expenditure (GRDE) table, and the Gross Regional GDP table for 2000. Note that in principle, GDP should equal the sum of primary factor payments (gross of depreciation) and indirect business taxes. As official data violate this condition, the model data is kept consistent with the levels in the input-output table, with shares in total based on the regional accounts.

**c) Compute regional exports, imports, and tariff revenue by sector**

As the regional accounts compute only the net exports, we need to generate our own estimates of exports and imports by region. First, imports are computed by weighting total imports (in the input-output table) by GRDP shares in GDP. The net export account is then added back to recover regional exports. We then disaggregate the trade accounts by sector. Exports and imports are disaggregated using the sector shares in the national SAM on the aggregate regional exports and imports from Step b). The tariff rates in the national SAM are applied equally to the regional imports to obtain tariff revenues.

**d) Disaggregate gross value added by sector and region**

Regional accounts data disaggregates gross value added (GVA) into the three major subdivisions, i.e. Agriculture, Industry, and Services. We divide Agriculture into our four sectors (Cereals, Livestock, Fish, Othagri) using output value shares from the

Bureau of Agricultural Statistics (BAS) data for 2000. Based on national SAM shares, Industry is divided into Agroproc and Othind, and Services into Trans and Othserv.

**e) Obtain regional primary inputs and indirect taxes**

The next task is to decompose gross value added into labor, capital, and indirect tax, by sector and region. The main data source for this is the Annual Survey of Business and Industry (ASBI), collected by NSO. Published data from the 2000 ASBI was regrouped into the sectors and regions of the model. Ratios of labor, capital, and indirect tax cost to gross value added were then applied to compute the primary factor and sales tax accounts of the regional SAMS.

**f) Construct the interregional trade data set**

For inter-regional flows of goods, the main source of information is the Domestic Trade data of the NSO. These statistics are derived from cargo declarations, waybills, manifests, and other documents collected in seaports, airports, and railway stations. There are several limitations of this data. First, no data is available on inter-regional trade in goods delivered by road transport. This omission is most relevant for the regions Metro Luzon and Other Luzon. Second, information about the source of transported goods is limited to its immediate port of origin. We simplify by assuming that the region hosting the port of origin produces the transported goods; likewise the region hosting the port of destination is the locus of demand for the transported goods. Third, the domestic trade data is limited to merchandise deliveries; hence we omit all services from inter-regional trade. Fourth, intraregional trade (that is, when ports of origin and destination are in the same region) is ignored (explaining the discrepancy between our totals and the Domestic Trade totals.)

To construct the data set, we relied on the Domestic Trade summary tables requested from the NSO. These tables summarize directed trade data (oriented by origin-destination) in terms of the following category:

- i. Food and live animals (Cereals, Lvpoul, Fish, Othagri)
- ii. Beverages and tobacco (Agroproc)
- iii. Crude materials (Othind)
- iv. Mineral fuels (Othind)
- v. Animal and vegetable oils (Agroproc)

- vi. Chemicals (Othind)
- vii. Manufactured materials (Othind)
- viii. Machinery and transport equipment (Othind)
- ix. Miscellaneous manufactures (Othind)
- x. Others not elsewhere classified (Othind)

The bracketed labels denote the corresponding sectors in our model. The Domestic Trade summaries have data disaggregated by two-digit industry classification, but is aggregated over the regions. The ratios from this table are used to allocate the domestic trade data into our model sectors.

Directed trade summaries by category is available for the island groupings (Luzon, Visayas, and Mindanao); we can directly use the Visayas and Mindanao for respectively Vis and Minda, data, but must disaggregate Luzon intraregional trade into trade between Mluz and Oluz, as well as Luzon interregional exports and imports to Vis and Minda. We do this using the ratios obtained from the complete directed trade totals by administrative region. Data on directed trade flows are shown in Table 3.

[TABLE 3 HERE]

#### **g) Construct aggregated regional SAM items**

Note that the SAM can be expressed in aggregate accounts, that is: Activities, Goods, Factors, Households, Government, Savings-Investment, Tax-income, Tax-business, and Foreign, each summed up over the economic sectors. The previous steps all contribute to completing the regional aggregate accounts; other items, such as transfers, are computed by using the RGDP shares in GDP. The exception is the regional income tax revenue, which is obtained by splitting up the national SAM account using regional share data from the Family Income and Expenditure Survey (FIES) of 2000, which is processed from public use data files provided by the NSO. As usual the savings-investment account is used to achieve a balance in the aggregate accounts.

#### **h) Construct regional SAMs**

The final step of course involves the construction of the regional SAMs. The regional SAM has all the accounts found in the national SAM, and adds the four regions for inter-regional trade, as well as four transaction entries by region (*Mluz-trans*, *Oluz-*



*trans, Vis-trans, Minda-trans*). Transaction cost is computed from unit transaction cost margins (as a ratio of market price). These ratios are estimated itself estimated from transport cost and logistic studies, summarized in Ordonez et al (2005), and Intal and Ranit (2004). Adjustments were made in terms of distance (i.e. adjacent regions will tend to have slightly lower unit transaction cost than more remote regions; this applies for the pair Mluz – Oluz, and Vis – any region, Some of the entries were verified for realism through key person interviews industry representatives. The transaction cost assumptions are shown in Table 4. Note that these figures are little more than “guestimates”, and should be regarded as a useful starting point rather than hard-and-fast numbers for conducting the analysis.

[TABLE 4 HERE]

The previous steps have generated the data to fill in the accounts for: indirect business tax, labor, capital, imports, tariff revenues, exports, and interregional trade. Consumption, government spending, and income taxes are subdivided across sectors based on the shares in the national SAM; consumption is further subdivided across regions using FIES shares. We provide preliminary figures for investment demand using a similar method; for intermediate demand we apply the shares in sector value added in the national SAM, applied to the sector value added by region, and adjusted proportionately to equal the total intermediate demand in the aggregated regional SAMs. Other items that do not require disaggregation (income tax, transfers, savings, etc.) are copied from the aggregate regional accounts.

This leads to regional SAMS that are everywhere in balance except for the sector accounts. The sector accounts are balanced using the RAS method on the inter-industry block, subject to the constraint that the intermediate demand by region sums up to the predetermined regional aggregate. The RAS and other disaggregation procedures imply that the regional SAMS will not add up perfectly to our original regional aggregates, although the deviations should be minor. Final results are shown in Annex 2. Table 5 presents the location quotients based on gross output shares. (The location quotients are ratios between regional and national output shares). Mluz specializes in Othind, while Oluz specializes in Cereals, Othagri, and services; Visayas specializes in Lvpoul, Fish, and Trans; finally Minda specializes in agricultural sectors and Othind.

[TABLE 5 HERE]

## 4.2. Calibration

Calibration involves the base data contained in the regional SAMs, on the assumption that 2000 data represents the Philippine regional economies in a state of equilibrium. Calibration also requires estimates of elasticities of substitution (the sigmas) to calibrate the parameters of the production and inter-economy equations. Here we arbitrarily set the absolute value of these elasticities to 2. Finally, estimates of expenditure elasticities as well as the Frisch parameter (whose absolute value is the ratio of expenditure to supernumerary expenditure) are needed to calibrate the LES (Table 6).

[TABLE 6 HERE]

The model is coded in the Generalized Algebraic Modeling System (GAMS) software. Processing of data is performed using Excel and CSPro (for the FIES); calibration is implemented in GAMS. MINOS Solver is used with an arbitrary objective variable and model equations as constraints. The baseline solution replicates the base data set.

## 4.3. Welfare

Aside from changes in all the endogenous variables listed in Section 3, the model also calculates welfare impact based on the compensating variation (CV). Current expenditure plus the CV equals the equivalent expenditure for achieving the same welfare level (hence a negative CV implies a welfare *improvement*.) Two important caveats to the scenario analysis are: first, there are no inter-regional transfers between households, as we lack data to trace household transfers from region *R* to region *RJ*. (The FIES does contain data on remittances received and transfers paid out, but no information about source or destination, respectively). Hence regional welfare changes should be cautiously interpreted owing to this omission. Second, the model imposes factor immobility, ruling out inter-regional arbitrage; hence the model solution should be associated only with a short-run equilibrium.

## 5. Experiments

### 5.1. Scenarios

We base our scenarios on the discussion in Section 2.1. The model can be used for national-to-regional analysis, or regional-to-national analysis. For the former, we identify the removal of trade protection in agriculture as a scenario, as agriculture is seen to be critical to regional development. For the latter, we examine the impact of improved marketing infrastructure. This improvement is expected to cause both a reduction in transaction cost of interregional imports from the region of origin, combined with a general productivity increase in marketing activity in the region of origin. In defining the scenarios, we omit the size of the requisite investment for lack of information.

The policy options for productivity improvement are: Catch-up and Concentration. The first refers improved marketing infrastructure in the lagging regions (Oluz, Vis, Minda); the second refers to improved marketing infrastructure in the leading region (Mluz). The Catch-up scenario option is also combined with the tariff experiment to examine complementarity between trade and competitiveness policies, particularly when the latter is directed to equipping the lagging regions to compete with imports.

Specifically the scenarios are:

**Scenario 1:** *Reform* – All tariffs for agricultural products are set uniformly to the 5%;

**Scenario 2:** *Catch-up investment* – 20% reduction in transaction cost for interregional imports from lagging regions, combined with a 5% productivity improvement in Trans production in these regions;

**Scenario 3:** *Concentration investment* – 20% reduction in transaction cost for interregional imports from Mluz, combined with a 5% productivity improvement in Trans production in Mluz;

**Scenario 4:** *Reform with investment* – Combination of Scenarios 1 and 2.

The combination of Reform with Catch-up investment is aimed at examining the degree of complementarity between these trade and regional investment policies. Here “complementary” is taken to mean mitigation of adverse impact, i.e. output contraction or price of import-competing sectors. An additional sense of complementarity is “synergy”, i.e. the changes in the combined scenarios exceed the simple sum of the changes in the individual scenarios. *Ex ante* there is no theoretical basis for expecting synergy due to

both partial and general equilibrium effects; this would have to be explored through numerical simulation.

## **5.2. Results**

In discussing the results we display percentage changes in selected endogenous variables. Other interesting information on changes in interregional trade flows, factor prices, and savings are shown in the Annex.

### *Reform scenario*

First we consider the Scenario 1, the Reform scenario. Across all regions, the fall in tariffs raises agricultural imports (Table 7). Import surges are registered by the sectors most affected by the reform, i.e. Lvpoul, followed by Cereals; there are smaller increments for Fish and Othagri, and mild adjustments for other sectors. Exports decline, consistent with theory. Among the import-competing sectors, only Cereals suffer an output contraction in all regions, along with Lvpoul in Mluz. The exposure to cheaper foreign agricultural goods causes domestic agricultural prices to fall; for most sectors and regions, prices for other sectors also fall slightly. The decline in price raises consumption of all goods, particularly Cereals. Tariff reform reduces interregional exports of Cereals from the lagging regions (but raises it for Mluz). From the viewpoint of a particular region (say Mluz), this highlights the lack of competitiveness of Cereals production in other regions (say Minda), relative to the foreign supplier; this is borne out by closer inspection of interregional imports and demand for the regional composite (see Annex Table 3-1.)

[TABLE 7 HERE]

### *Productivity improvement scenarios*

For Scenario 2 or Catch-up Investment (Table 8) , lower transaction cost and marketing productivity in the lagging regions raises interregional exports; the leading region though receives the least boost. Changes in output are small, except for Trans, which are relatively substantial and positive; changes in output for the other sectors are of mixed direction, except for Oluz, which are all increasing. Market prices decrease for Trans, but rises in general; this is probably due to an increase in purchasing power, as consumption across sectors and regions increases. This is consistent with the uniform

increase in imports increase (except Trans). Most of the sectors and regions witness a fall in exports. Together with the minimal changes in output, this implies that increases in interregional exports of the lagging regions came at the expense of production for home and foreign markets. Outcomes for Scenario 3, or Concentration investment, mirror that of the Catch-up scenario, but with the changes for the leading and lagging regions reversed.

[TABLE 8 HERE]

[TABLE 9 HERE]

The results for Scenario 4, or the Reform with investment scenario, are close to what would be obtained from simply adding together the changes from both the Reform and Catch-up scenarios. Hence contractionary effects on the agricultural sectors owing to tariff reform are mitigated by expansionary effects owing to regional investment. However there appears to be little synergy from combining the two policies.

[TABLE 10 HERE]

#### *Output and welfare impacts of the scenarios*

Changes in regional GDP and household welfare (using the CV measure) are shown in Table 11; also shown is the national CV, equal to the sum of the changes in regional CV. For all the scenarios, regional GDP and household welfare increase. Tariff reform has the lowest impact using both output and welfare measures, despite the dramatic adjustment contemplated (i.e. elimination of agricultural protection). Across the scenarios, the largest RGDP change and CV occur for Mluz under the Concentration investment scenario; this scenario also leads to the biggest welfare pay-off.

However, for the lagging regions, the welfare changes for the Catch-up scenario are much greater than those in the Concentration scenario (though this disparity is not observed in the output measure). The fact that the latter exhibits a greater overall impact is explained purely by the concentration of welfare benefit in Mluz. Finally, for both RGDP and CV, the Reform with investment scenario is approximately the sum of the Reform and Catch-up investment scenarios. This is consistent with our results on complementarity, i.e. sheer mitigation of adverse impact, without synergies between tariff reform and regional investment.

[TABLE 11 HERE]

## **6. Conclusion and future directions**

To summarize the salient findings: First, tariff reform is beneficial, for the economy as a whole, and even for the lagging regions. Second, the scope for further welfare improvement from agricultural trade reform is limited. Much has already been accomplished in this area (despite recent policy reversals), confining severe distortions to a few sectors. On the other hand, there is a considerable scope for welfare gain from improvements in marketing infrastructure. Third, the trade-off between size and distribution of welfare gain is certainly an issue to be confronted in targeting infrastructure investments, as our analysis suggests that concentrating improvements to the leading region leads to the greatest welfare benefit, but this benefit is likewise concentrated in the leading region. Fourth, we find complementarity between tariff reform and regional investment, i.e. contractionary impacts from the former are mitigated by expansionary effects of the latter. There are however no additional welfare benefits from pursuing both policies simultaneously. This suggests that, unless distributional concerns are paramount, both policies can be pursued independently, e.g. tariff reform need not be held hostage by the absence of expansionary regional investments.

This study constructs the first regional model for the Philippines using the most recent (year 2000) data. Rather than taking the top-down approach, we adopt a bottom-up strategy, modeling the national economy as the interaction of four distinct regional sub-economies. The model can transcend the usual types of analysis performed by CGE models by adding regional disaggregation in the shocks and outcomes. There remains nevertheless considerable work to be done to advance the analysis.

The more immediate and remediable limitation is the lack of disaggregation of households into income groups, and further disaggregation of sectors and super-regions. Dynamic analysis can also be readily introduced, by incorporating time-varying exogenous variables (growth in productive factors, trends in technology and world prices, etc.), as well as gradual adjustment of factor prices due to factor mobility.

Other limitations are related require more serious investment in data collection. Among the major constraints in building a regional data set are the lack of input-output data at the regional level, as well as information on interregional flows of goods

(including land transport) and household transfers. Finally, empirical estimation would be the preferred method for quantifying key parameters on transaction cost of interregional flows, and elasticities of demand and substitution by sector and region.

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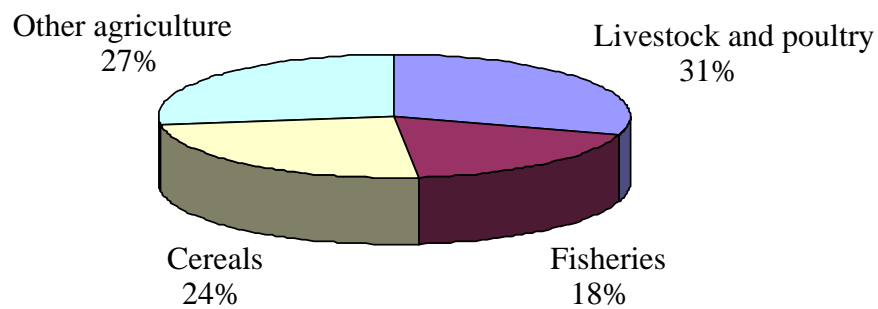
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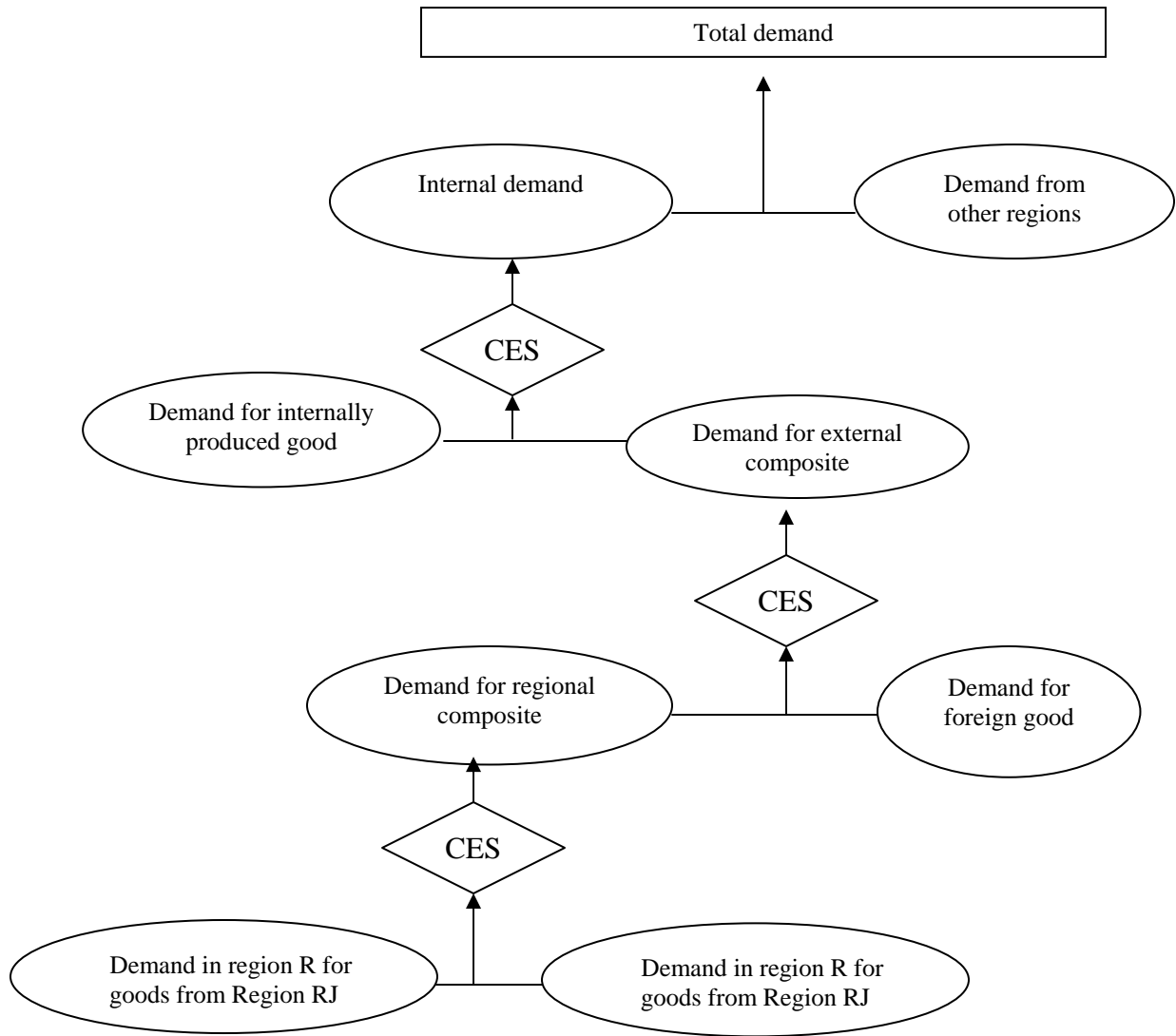
## Figures and Tables

**Figure 1: Shares in value of production of the agricultural sectors, 2006**

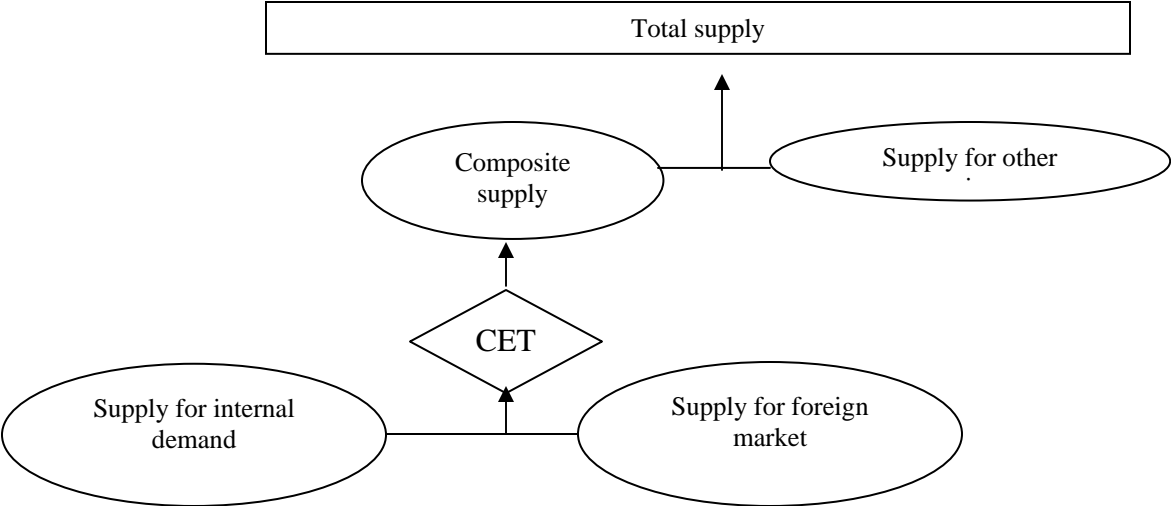


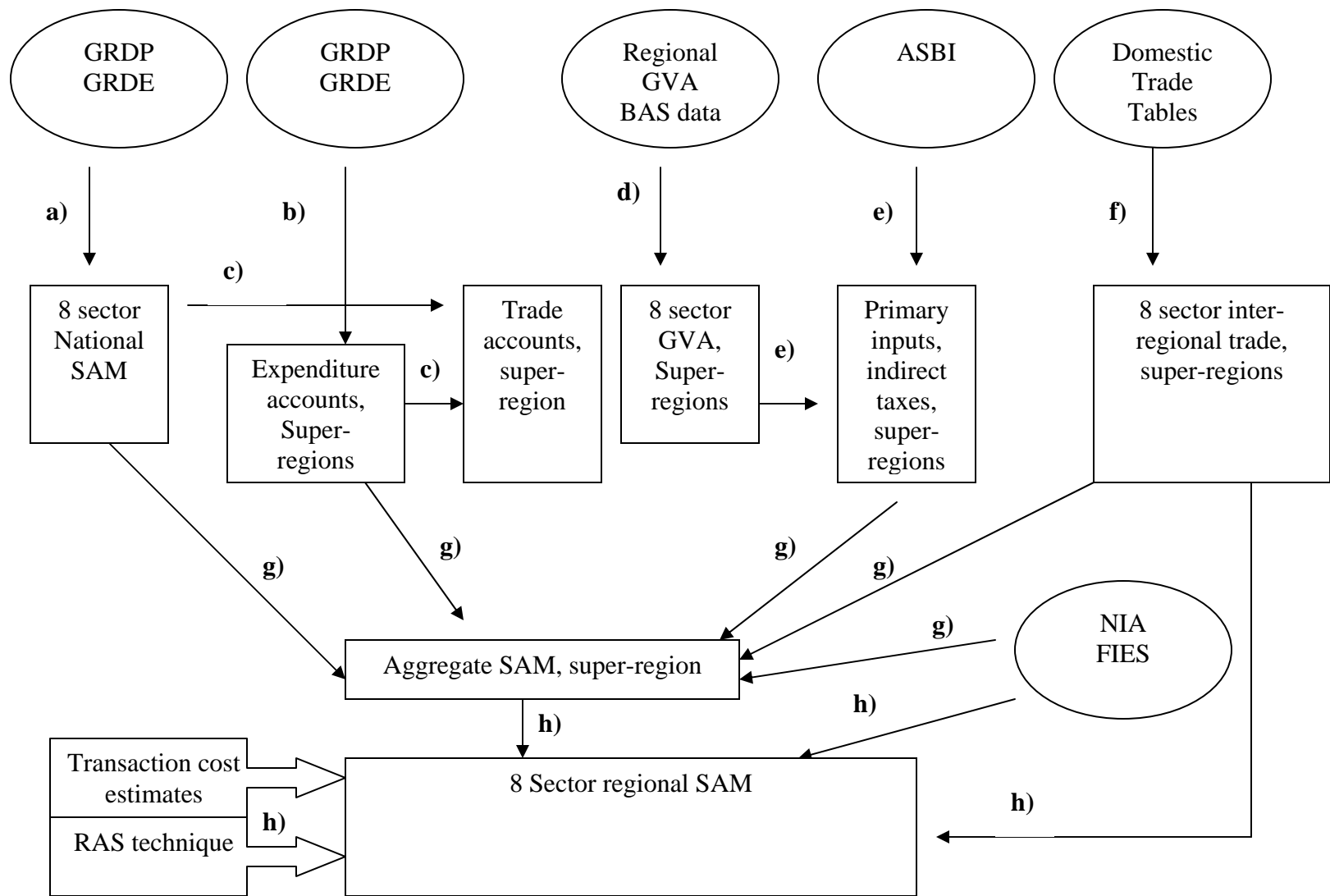
Source: BAS, 2008.

**Figure 2: Schematic for the demand side**



**Figure 3: Schematic for the supply side**





**Table 1: Selected regional indicators for the Philippines**

Region	Per capita relative GDP (Philippines = 100)	Poverty incidence (%)	Agriculture share in GDP (%)
<b>Luzon:</b>			
NCR	258	10.4	0
CAR	124	32.7	13
Region I – Ilocos	106	36.6	30
Region II - Cagayan Valley	98	52.7	42
Region III - Central Luzon	96	40.8	27
Region IVA – CALABARZON	95	48.5	11
Region IVB – MIMAROPA	89	35.4	26
Region V – Bicol	86	51.1	19
<b>Visayas:</b>			
Region VI - Western Visayas	82	34.5	42
Region VII - Central Visayas	78	20.9	24
Region VIII - Eastern Visayas	69	43.1	49
<b>Mindanao:</b>			
Region IX – Western Mindanao	55	20.7	51
Region X – Northern Mindanao	54	25.5	43
Region XI – Southern Mindanao	47	52.6	37
Region XII – Central Mindanao	46	45.3	33
Caraga	46	38.6	33
ARMM	24	61.8	57

Source: NSCB

**Table 2: National SAM for the Philippines, 2000 ('000,000 pesos)**

	Cereals- Act	Lvpoul- Act	Fish-Act	Othag-Act	Agroproc- Act	Othind- Act	Trans-Act	Othserv- Act	Cereals	Lvpoul	Fish	Othag	Agroproc
Cereals-Act									145,000				
Lvpoul-Act										190,749			
Fish-Act											139,953		
Othag-Act												194,802	
Agroproc-Act													2,851,888
Othind-Act													
Trans-Act													
Othserv-Act													
Cereals	5,741	2,321	0	0	3,292	134,763	4,718	611					
Lvpoul	0	11,857	0	0	690	129,698	1,823	2,334					
Fish	0	0	7,455	0	5,680	17,112	1,727	6,900					
Othag	5,616	3,719	1,924	11,837	14,858	59,261	6,158	10,593					
Agroproc	0	29,670	5,660	0	21,079	136,920	44,021	91,958					
Othind	15,599	12,353	12,975	19,568	1,213,585	84,833	211,228	235,866					
Trans	1,060	2,059	1,473	2,307	269,163	36,144	79,107	31,812					
Othserv	2,804	7,787	2,073	5,076	77,688	11,589	103,805	238,894					
Lab	55,492	42,654	26,960	56,498	355,641	69,051	180,157	551,757					
Cap	58,688	78,328	81,433	99,515	890,213	180,863	506,193	648,235					
House													
Gov													
Savinv													
Tax-inc													
Tax-bus									4,859	4,141	2,161	5,081	37,330
Tax-trade									2,932	538	24	862	10,893
Foreign									14,818	2,232	299	12,640	62,205



**Table 2: National SAM for the Philippines, 2000 (continued)**

	Othind	Trans	Othserv	Lab	Cap	House	Gov	Savinv	Tax-inc	Tax-bus	Tax-trade	Foreign
Cereals-Act												
Lvpoul-Act												
Fish-Act												
Othag-Act												
Agroproc-Act												
Othind-Act	860,234											
Trans-Act		1,138,936										
Othserv-Act			1,818,959									
Cereals						6,534	0	9,560				68
Lvpoul						26,746	0	24,436				77
Fish						91,311	0	1,156				11,098
Othag						70,713	0	10,506				18,199
Agroproc						579,526	0	8,691				53,137
Othind						412,270	0	578,029				1,532,269
Trans						748,534	0	40,519				84,148
Othserv						980,059	439,125	0				127,130
Lab												
Cap												
House				1,338,209	2,543,469		67,655					21,527
Gov									195,554	180,093	115,205	2,881
Savinv						859,613	-13,046					-173,669
Tax-inc						195,554						
Tax-bus	73,540	12,343	40,638									
Tax-trade	99,955	0	0									
Foreign	1,303,194	145,046	136,431									

**Table 3: Interregional trade by model sector and region, 2000 ('000 pesos)**

Origin	Destination				
	Mluz	Oluz	Vis	Minda	All regions
<b>Cereals</b>					
Mluz	0	717,152	4,210,765	2,756,680	7,684,597
Oluz	0	0	134,199	79,432	213,632
Vis	1,858,869	130,378	0	913,012	2,902,259
Minda	5,259,732	169,847	2,298,787	0	7,728,365
<b>Lvpoul</b>					
Mluz	0	501,960	2,947,263	1,929,497	5,378,720
Oluz	0	0	93,931	55,598	149,528
Vis	1,301,088	91,256	0	639,049	2,031,393
Minda	3,681,471	118,882	1,609,002	0	5,409,355
<b>Fish</b>					
Mluz	0	337,622	1,982,352	1,297,795	3,617,769
Oluz	0	0	63,179	37,395	100,574
Vis	875,122	61,380	0	429,829	1,366,331
Minda	2,476,186	79,961	1,082,227	0	3,638,374
<b>Othagri</b>					
Mluz	0	467,129	2,742,753	1,795,610	5,005,491
Oluz	0	0	87,413	51,740	139,153
Vis	1,210,805	84,924	0	594,706	1,890,435
Minda	3,426,015	110,632	1,497,353	0	5,034,001
<b>Agroproc</b>					
Mluz	0	1,267,843	10,791,759	9,697,202	21,756,804
Oluz	2,361,827	0	343,939	279,420	2,985,186
Vis	2,696,497	189,128	0	4,208,380	7,094,006
Minda	7,646,430	246,917	4,042,679	0	11,936,027
<b>Othind</b>					
Mluz	0	4,331,102	30,598,657	29,663,054	64,592,813
Oluz	3,225,047	0	975,194	854,727	5,054,968
Vis	6,654,546	466,740	0	10,537,337	17,658,623
Minda	11,021,467	355,904	12,854,161	0	24,231,532
<b>All sectors</b>					
Mluz	0	7,622,806	53,273,548	47,139,839	108,036,193
Oluz	5,586,874	0	1,697,854	1,358,312	8,643,040
Vis	14,596,925	1,023,808	0	17,322,313	32,943,046
Minda	33,511,302	1,082,142	23,384,209	0	57,977,653
All regions	53,695,101	9,728,756	78,355,611	65,820,464	207,599,932

**Table 4: Location quotients based on gross output shares, 2000**

	Mluz	Othluz	Vis	Minda
Cereals	0.39	2.99	0.95	1.95
Lvpoul	0.69	1.05	1.83	1.15
Fish	0.51	1.06	2.06	1.52
Othagri	0.69	1.45	0.95	1.87
Agroproc	1.04	0.99	1.08	0.78
Othind	1.15	0.52	0.78	1.01
Trans	0.92	1.16	1.24	0.92
Othserv	1.02	1.34	0.83	0.91

*Source:* Author's data.

**Table 5: Unit transaction cost estimates by sector and trade direction**

Origin	Destination			
	Mluz	Oluz	Vis	Minda
Mluz				
Cereals	-	0.200	0.200	0.200
Lvpoul	-	0.190	0.200	0.200
Fish	-	0.050	0.060	0.070
Othagri	-	0.300	0.300	0.300
Agroproc	-	0.230	0.240	0.250
Othind	-	0.140	0.140	0.150
Oluz				
Cereals	0.200	-	0.200	0.200
Lvpoul	0.190	-	0.200	0.200
Fish	0.050	-	0.060	0.070
Othagri	0.300	-	0.300	0.300
Agroproc	0.230	-	0.240	0.250
Othind	0.100	-	0.140	0.150
Vis				
Cereals	0.200	0.200	-	0.200
Lvpoul	0.190	0.190	-	0.200
Fish	0.060	0.060	-	0.060
Othagri	0.300	0.300	-	0.300
Agroproc	0.230	0.230	-	0.230
Othind	0.140	0.140	-	0.150
Minda				
Cereals	0.200	0.200	0.189	-
Lvpoul	0.200	0.200	0.150	-
Fish	0.070	0.070	0.050	-
Othagri	0.300	0.300	0.300	-
Agroproc	0.250	0.240	0.230	-
Othind	0.150	0.140	0.140	-

Source: Author's estimates from multiple sources.

**Table 6: Household expenditure elasticities by sector and region**

	Mluz	Oluz	Vis	Minda
Cereals	1.00	1.00	1.00	1.00
Lvpoul	0.80	0.80	0.80	0.80
Fish	0.80	0.80	0.80	0.80
Othagri	1.20	1.20	1.20	1.20
Agroproc	1.00	1.00	1.00	1.00
Othind	1.20	1.20	1.20	1.20
Trans	0.80	0.80	0.80	0.80
Othserv	1.10	1.04	1.06	1.04

Source: Author's estimates from various sources.

**Table 7: Changes in selected variables, Reform scenario (%)**

	Mluz	Oluz	Vis	Minda
<b>IMPORTS</b>				
Cereals	24.94	29.42	27.98	29.23
Lvpoul	39.71	40.10	40.55	40.42
Fish	6.30	6.24	6.66	6.65
Othagri	3.44	3.60	3.96	4.03
Agroproc	0.39	0.24	0.58	0.52
Othind	-0.04	-0.04	0.18	0.12
Trans	0.25	0.20	0.44	0.38
Othserv	0.26	0.19	0.38	0.29
<b>EXPORTS</b>				
Cereals	-6.17	-0.59	-2.87	-1.60
Lvpoul	-0.36	-0.12	0.01	-0.15
Fish	-0.16	-0.09	-0.08	-0.17
Othagri	-0.10	-0.13	-0.37	-0.04
Agroproc	0.02	-0.08	-0.10	-0.15
Othind	0.41	0.80	0.60	0.63
Trans	-0.27	-0.10	-0.22	-0.15
Othserv	-0.29	-0.12	-0.48	-0.31
<b>OUTPUT</b>				
Cereals	-5.10	-0.58	-2.27	-1.15
Lvpoul	-0.18	0.08	0.30	0.18
Fish	0.01	0.04	0.24	0.18
Othagri	-0.08	-0.02	0.00	0.22
Agroproc	0.19	0.08	0.23	0.16
Othind	0.32	0.50	0.59	0.57
Trans	-0.04	0.04	0.08	0.09
Othserv	-0.04	0.03	-0.10	-0.04
<b>GOVERNMENT CONSUMPTION</b>				
	-0.04	0.02	-0.10	-0.05
<b>PRICE</b>				
Cereals	-2.34	-0.54	-1.22	-0.70
Lvpoul	-0.21	-0.13	-0.03	-0.07
Fish	0.00	-0.03	0.07	0.09
Othagri	-0.22	-0.11	-0.03	-0.02
Agroproc	0.00	-0.01	0.07	0.06
Othind	-0.14	-0.17	-0.10	-0.12
Trans	0.02	-0.02	0.06	0.02
Othserv	0.04	-0.02	0.10	0.05
<b>CONSUMPTION</b>				
Cereals	1.96	0.43	0.96	0.57
Lvpoul	0.16	0.11	0.09	0.10
Fish	0.03	0.05	0.04	0.01
Othagri	0.26	0.14	0.14	0.11
Agroproc	0.04	0.05	0.05	0.03
Othind	0.18	0.19	0.20	0.19
Trans	0.02	0.05	0.04	0.05
Othserv	0.01	0.06	0.02	0.05
<b>DEMAND OF OTHER REGIONS – TOTAL</b>				
Cereals	2.55	-0.61	-0.98	-2.27
Lvpoul	0.69	0.60	0.04	0.12
Fish	0.35	0.44	0.03	-0.01
Othagri	0.59	0.44	-0.02	-0.06
Agroproc	0.34	0.26	0.16	0.16
Othind	0.19	0.14	0.05	0.10

Source: Author's calculations

**Table 8: Changes in selected variables, Catch-up Investment scenario (%)**

	Mluz	Oluz	Vis	Minda
<b>DEMAND OF OTHER REGIONS - TOTAL</b>				
Cereals	2.53	8.44	7.07	6.86
Lvpoul	1.88	8.17	7.09	7.27
Fish	1.38	3.98	2.28	2.22
Othagri	2.82	12.10	10.20	10.00
Agroproc	1.77	8.95	9.44	8.86
Othind	1.09	5.75	6.31	6.37
<b>GROSS OUTPUT</b>				
Cereals	-0.55	0.44	-0.23	-0.34
Lvpoul	0.25	0.32	0.63	-0.16
Fish	-0.12	0.34	0.64	0.01
Othagri	-0.14	0.36	-0.24	-0.17
Agroproc	0.16	0.61	0.82	-0.11
Othind	0.42	0.24	0.58	-0.42
Trans	-0.21	2.39	2.79	3.22
Othserv	-0.12	0.35	-0.16	0.02
<b>MARKET PRICE</b>				
Cereals	-0.23	0.38	0.30	0.50
Lvpoul	0.12	0.39	0.29	0.52
Fish	0.24	0.19	0.45	0.68
Othagri	-0.13	0.29	0.39	0.52
Agroproc	0.19	-0.01	0.06	0.34
Othind	0.11	0.17	-0.05	0.05
Trans	0.30	-2.42	-2.48	-2.62
Othserv	0.31	0.18	0.76	0.52
<b>CONSUMPTION</b>				
Cereals	0.45	0.31	0.75	0.48
Lvpoul	0.13	0.25	0.61	0.37
Fish	0.06	0.36	0.52	0.28
Othagri	0.44	0.46	0.82	0.56
Agroproc	0.11	0.59	0.92	0.59
Othind	0.21	0.56	1.20	0.96
Trans	0.02	1.87	2.21	2.19
Othserv	0.01	0.47	0.45	0.49
<b>GOVERNMENT CONSUMPTION</b>				
	-0.31	-0.18	-0.76	-0.52
<b>IMPORTS</b>				
Cereals	-0.13	1.03	1.17	0.75
Lvpoul	0.51	0.91	1.11	0.77
Fish	0.32	0.46	1.37	1.27
Othagri	-0.01	0.81	1.35	0.94
Agroproc	0.45	0.33	0.88	0.80
Othind	0.58	0.57	0.33	0.40
Trans	0.20	-3.52	-3.60	-4.05
Othserv	0.30	0.45	1.40	0.96
<b>EXPORTS</b>				
Cereals	-0.97	-0.15	-1.61	-1.42
Lvpoul	0.00	-0.27	0.15	-1.08
Fish	-0.45	0.22	-0.04	-1.09
Othagri	-0.24	-0.07	-1.53	-1.15
Agroproc	-0.11	0.88	0.77	-0.92
Othind	0.37	0.05	0.59	-0.53
Trans	-0.55	8.45	8.59	9.45
Othserv	-0.47	0.25	-1.40	-0.74

Source: Author's calculations

**Table 9: Changes in selected variables, Concentration investment scenario (%)**

	Mluz	Oluz	Vis	Minda
<b>DEMAND OF OTHER REGIONS - TOTAL</b>				
Cereals	7.07	0.69	1.69	1.39
Lvpoul	6.69	0.92	1.65	1.75
Fish	1.81	0.80	1.25	1.26
Othagri	9.82	0.53	2.05	1.80
Agroproc	7.64	2.07	1.04	1.88
Othind	4.34	1.34	1.03	1.27
<b>GROSS OUTPUT</b>				
Cereals	-0.43	0.15	-0.02	0.20
Lvpoul	0.03	0.12	0.73	0.32
Fish	-0.02	0.01	0.42	0.18
Othagri	0.16	-0.07	-0.31	0.12
Agroproc	-0.02	-0.03	0.15	-0.17
Othind	-0.36	0.24	1.07	0.62
Trans	4.91	-0.12	-0.54	-0.68
Othserv	-0.13	-0.07	-0.23	-0.10
<b>MARKET PRICE</b>				
Cereals	0.62	0.27	0.17	0.36
Lvpoul	0.84	0.27	0.36	0.39
Fish	0.99	0.30	0.48	0.54
Othagri	0.59	0.23	0.19	0.37
Agroproc	0.82	0.28	0.33	0.26
Othind	0.60	0.30	0.11	0.09
Trans	-3.14	0.32	0.49	0.43
Othserv	0.99	0.31	0.60	0.47
<b>CONSUMPTION</b>				
Cereals	0.75	0.03	0.35	0.19
Lvpoul	0.46	0.02	0.17	0.14
Fish	0.37	0.01	0.11	0.05
Othagri	0.93	0.07	0.41	0.23
Agroproc	0.59	0.03	0.24	0.27
Othind	0.92	0.01	0.47	0.46
Trans	3.11	0.00	0.10	0.12
Othserv	0.50	0.00	0.05	0.12
<b>GOVERNMENT CONSUMPTION</b>				
	-0.98	-0.31	-0.59	-0.47
<b>IMPORTS</b>				
Cereals	0.58	-0.03	0.47	0.54
Lvpoul	1.01	-0.05	0.83	0.55
Fish	1.52	-0.19	0.64	0.56
Othagri	0.84	-0.26	0.21	0.43
Agroproc	0.95	-0.21	0.38	0.09
Othind	1.21	-0.20	-0.43	-0.43
Trans	-4.34	-0.31	-0.33	-0.60
Othserv	1.27	-0.26	0.27	0.09
<b>EXPORTS</b>				
Cereals	-1.43	0.33	-0.51	-0.13
Lvpoul	-0.95	0.28	0.62	0.08
Fish	-1.12	0.20	0.23	-0.17
Othagri	-0.36	0.12	-0.74	-0.16
Agroproc	-0.91	0.14	-0.06	-0.40
Othind	-0.75	0.49	1.13	0.76
Trans	13.11	0.07	-0.73	-0.74
Othserv	-1.30	0.11	-0.62	-0.25

Source: Author's calculations

**Table 10: Changes in selected variables, Reform with investment scenario**

	Mluz	Oluz	Vis	Minda
<b>DEMAND OF OTHER REGIONS - TOTAL</b>				
Cereals	1.40	3.74	3.01	3.34
Lvpoul	1.31	3.63	3.32	3.54
Fish	1.31	2.19	1.31	1.65
Othagri	1.72	5.03	4.41	4.85
Agroproc	1.77	3.43	3.94	4.41
Othind	1.82	2.44	3.34	3.32
<b>GROSS OUTPUT</b>				
Cereals	-6.41	1.11	-0.01	-0.28
Lvpoul	0.04	1.62	1.39	0.47
Fish	-0.28	1.06	1.61	0.66
Othagri	-0.11	1.60	1.39	0.79
Agroproc	0.34	1.85	2.47	1.05
Othind	0.68	1.54	1.44	0.49
Trans	0.05	7.23	9.00	10.59
Othserv	-0.26	0.79	-0.19	0.11
<b>MARKET PRICE</b>				
Cereals	-2.57	1.43	1.02	0.94
Lvpoul	0.25	1.72	0.86	1.24
Fish	0.47	1.14	1.18	1.56
Othagri	0.08	1.61	1.93	1.40
Agroproc	0.54	0.53	0.24	1.25
Othind	0.32	0.80	0.47	0.61
Trans	0.66	-6.28	-7.14	-7.56
Othserv	0.69	1.03	1.69	1.15
<b>CONSUMPTION</b>				
Cereals	2.69	1.06	1.54	1.19
Lvpoul	0.29	0.69	1.32	0.79
Fish	0.15	1.01	1.14	0.61
Othagri	0.60	1.13	1.07	1.05
Agroproc	0.13	1.70	2.09	0.98
Othind	0.37	1.81	2.31	1.71
Trans	0.03	5.53	6.26	6.19
Othserv	0.02	1.39	1.12	1.09
<b>GOVERNMENT CONSUMPTION</b>				
	-0.68	-1.02	-1.67	-1.14
<b>IMPORTS</b>				
Cereals	19.78	30.82	29.44	28.11
Lvpoul	35.69	41.21	38.36	38.20
Fish	2.91	5.17	5.83	5.63
Othagri	0.09	4.21	4.70	2.91
Agroproc	0.84	2.15	2.12	2.76
Othind	0.50	4.37	1.91	2.17
Trans	0.75	-8.38	-9.80	-10.92
Othserv	0.46	2.22	3.09	2.02
<b>EXPORTS</b>				
Cereals	-8.01	-1.69	-2.82	-2.34
Lvpoul	-0.41	-1.25	0.34	-1.37
Fish	-0.77	-0.41	0.12	-1.42
Othagri	-0.24	-0.84	-1.24	-1.05
Agroproc	-0.11	1.56	2.80	-0.46
Othind	0.72	0.00	1.43	0.27
Trans	-0.52	24.79	27.93	31.11
Othserv	-0.87	-0.58	-2.75	-1.41

Source: Author's calculations



**Table 11: Household welfare impact by region and scenario (values in million pesos)**

	Mluz	Oluz	Vis	Minda	Total
<b>Reform</b>					
Change in RGDP (%)	0.05	0.04	0.12	0.09	
CV	-772	-331	-326	-327	-1,757
CV in percent	-0.05	-0.08	-0.07	-0.07	
<b>Catch-up</b>					
Change in RGDP (%)	0.33	0.42	0.82	0.71	
CV	-1,044	-3,196	-5,276	-4,402	-13,918
CV in percent	-0.07	-0.77	-1.06	-0.92	
<b>Concentration</b>					
Change in RGDP (%)	1.01	0.31	0.62	0.58	
CV	-20,470	-51	-906	-996	-22,423
CV in percent	-1.34	-0.01	-0.18	-0.21	
<b>Reform with investment</b>					
Change in RGDP (%)	0.38	0.45	0.94	0.80	
CV	-1,811	-3,514	-5,607	-4,730	-15,662
CV in percent	-0.12	-0.85	-1.13	-0.99	

*Source:* Author's calculations

**ANNEXES**  
**(not for publication)**

## Annexes

### Regional Model

**Table 0-1: Set and variable definitions**

<b>Sets of the model</b>	
$G$	Production sectors
$R$ or $RJ$	Regions
$H$	Households
<b>Variables – Institutions</b>	
$QCH_{G,H,R}$	consumption by sector by household
$QC_{G,R}$	consumption by sector
$P_{G,R}$	market price
$XPEN_{H,R}$	Expenditure
$YD_{H,R}$	household disposable income
$HHSAV_{H,R}$	household savings by HH group
$HSAV_R$	household savings
$Y_{H,R}$	total income
$GDEM_{G,R}$	government demand for goods
$TXR_R$	tax revenue by region
$GSAV_R$	government savings by region
$MPRT_R$	total imports by region in foreign currency
$XPRT_R$	total exports by region in foreign currency
$FSAV_R$	foreign savings by region
$RSAV_R$	net trade of region R with other regions
$SAVR_R$	total savings by region
$QINV_{G,R}$	investment demand
$QINT_{G,R}$	intermediate input demand
$QDT_{G,R}$	total demand
$QD_{G,R}$	internal demand - CES composite of external and home good
$QDRR_{G,R,RJ}$	demand in region R for product G from region RJ
<b>Variables – production</b>	
$PST_{G,R}$	price of gross output
$QST_{G,R}$	gross output
$LAB_{G,R}$	labor used to produce gross output
$CAP_{G,R}$	capital services used to produce gross output

$WAG_R$	factor price of labor
$REN_R$	factor price of capital services
$PVA_{G,R}$	price of value added per unit of gross output
<b>Variables - Inter-economy trade and closure</b>	
$PD_{G,R}$	price of internal demand
$PH_{G,R}$	price of home good
$QDH_{G,R}$	demand for home good
$PDRF_{G,R}$	price of external component of internal demand
$QDRF_{G,R}$	demand for external component of CES composite
$PDR_{G,R}$	price of aggregate regional good
$QDR_{G,R}$	quantity of aggregate regional good
$PM_G$	import price in local currency gross of tariff
$QDF_{G,R}$	import demand
$PR_{G,R,RJ}$	price paid by region $R$ for product $G$ from region $RJ$
$PTC_R$	price of transaction good
$QTCG_{G,R,RJ}$	quantity of transaction good in $R$ to import $G$ from $RJ$
$QTC_R$	quantity of transaction cost good
$QS_{G,R}$	output - CET composite of home-external
$PS_{G,R}$	price of output - CET composite
$QSH_{G,R}$	supply of home good
$PX_G$	export price in local currency
$QSF_{G,R}$	supply of export good
$RGDP_R$	regional Gross Domestic Product
$CPI_R$	price index

**Table 0-2: Parameters and exogenous variables**

<b>Institutions</b>	
$\beta_{G,H,R}$	Expenditure share parameter in LES equation
$\gamma_{G,H,R}$	subsistence consumption
$aps_{H,R}$	average propensity to save
$labe_{H,R}$	labor endowment
$cape_{H,R}$	capital endowment
$txy_{H,R}$	income tax rate
$gtrh_{H,R}$	net government transfers to households

$ftrh_{G,R}$	net foreign transfers to households in dollars
$gbudn$	total government spending budget - national
$shgb_{G,R}$	share allocation of government budget
$pwm_G$	import price in world market, in dollars
$pwx_G$	export price in the world market, in dollars
$txb_{G,R}$	indirect tax rate
$txm_{G,R}$	tariff rate
$usir_{G,R}$	proportion of regional savings allocated to regional investment
$ftrg_R$	net foreign transfers to government in foreign currency
<b>Production</b>	
$sig_{G,R}$	elasticity of substitution in CES production
$\rho_{G,R}$	parameter of elasticity of substitution in CES production
$\delta L_{G,R}$	share parameter of labor in CES production
$\delta K_{G,R}$	share parameter of capital in CES production
$\lambda_{G,R}$	productivity parameter in CES production
$io_{G,R}$	input-output coefficient
<b>Inter-economy and closure</b>	
$\sigma D_{G,R}$	elasticity of substitution in CES composite
$\delta DRF_{G,R}$	external good parameter in CES composite
$\delta H_{G,R}$	home good parameter in CES composite
$\sigma DRF_{G,R}$	elasticity of substitution in outside good composite - demand
$\delta DR_{G,R}$	regional aggregate parameter in outside good composite
$\delta DF_{G,R}$	import parameter in outside good composite – demand
$\sigma DR_{G,R}$	elasticity of substitution of components of regional aggregate - demand
$\delta DRR_{G,R,RJ}$	regional component parameter in regional aggregate - demand
$tc_{G,R,RJ}$	unit transaction cost in $R$ for purchasing $G$ from $RJ$
$\sigma S_{G,R}$	elasticity of substitution in CET composite
$\delta SF_{G,R}$	export parameter in outside good composite - supply
$\delta SH_{G,R}$	home good parameter in CET composite
$fsavn$	equilibrium level of foreign savings
$rsh_{G,R}$	share of consumption spending on $G$ at the regional level, baseline
$shr(R)$	consumption share of region, baseline
$cpib$	market price index, baseline

**Table 0-3: Equations of the model**

<b>Institutions</b>	
Household consumption by region:	
$QCH_{G,H,R} = \gamma_{G,H,R} + \frac{\beta_{G,H,R}}{P_{G,R}} \left( XPEN_{H,R} - \sum_G P_{G,R} \cdot \gamma_{G,H,R} \right)$	(I1)
Total household consumption by region:	
$QC_R = \sum_H QCH_{H,R}$	(I2)
Household expenditure by region:	
$XPEN_{H,R} = YD_{H,R} - HSAVH_{H,R}$	(I3)
Household savings by region:	
$HSAVH_{H,R} = aps_{H,R} \cdot YD_{H,R}$	(I4)
Total household savings by region:	
$HSAV_R = \sum_H HSAVH_{H,R}$	(I5)
Household disposable income by region:	
$YD_{H,R} = Y_{H,R} \cdot (1 - txy_{H,R}) + ftrh_{H,R} \cdot ER + gtrh_{H,R}$	(I6)
Household factor income by region:	
$Y_{H,R} = WAG_R \cdot labe_{H,R} + REN_R \cdot cape_{H,R}$	(I7)
Government consumption spending by sector and region:	
$P_{G,R} \cdot GDEM_{G,R} = gbudn \cdot shgb_{G,R}$	(I8)
Total tax revenue by region:	
$TXR_R = \sum_R \sum_H txy_{H,R} \cdot Y_{H,R} + \sum_G txb_{G,R} \cdot PD_{G,R} \cdot QDT_{G,R} + \sum_H gtrh_{H,R}$	(I9)
Government savings on current income and expenditure, by sector and region:	
$GSAV_R = TXR_R + ftrg_R \cdot ER - \sum_G P_{G,R} \cdot GDEM_{G,R} - \sum_H gtrh_{H,R}$	(I10)
Total imports by region, in dollars:	
$MPRT_R = \sum_G pwm_G \cdot QDF_{G,R}$	(I11)
Total exports by region, in dollars:	
$XPRT_R = \sum_G pwx_G \cdot QSF_{G,R}$	(I12)
Foreign savings:	

$$FSAV_R = \left( MPRT_R - XPRT_R - \sum_H ftrh_{H,R} - ftrg_R \right) \cdot ER \quad (I13)$$

Net trade with other regions:

$$RSAV_R = \sum_G P_{G,RJ} \cdot QDRR_{G,R,RJ} - \sum_G P_{G,R} \cdot QDRR_{G,RJ,R} \quad (I14)$$

Total regional savings:

$$SAV_R = HSAV_R + GSAV_R + FSAV_R + RSAV_R \quad (I15)$$

Total internal demand (A):

$$QD_{G,R} = QC_{G,R} + QINV_{G,R} + GDEM_{G,R} + QINT_{G,R}; \quad G \neq Trans \quad (I16)$$

Total internal demand (B):

$$QD_{G,R} = QC_{G,R} + QINV_{G,R} + GDEM_{G,R} + QINT_{G,R} + QTC_R; \quad G = Trans \quad (I17)$$

Investment demand:

$$QINV_{G,R} = usir_R \cdot SAV_R \quad (I18)$$

Total demand:

$$QDT_{G,R} = QD_{G,R} + \sum_{RJ} QDRR_{G,RJ,R} \quad (I19)$$

### Production

Gross output:

$$QST_{G,R} = \lambda_{G,R} \cdot \left( \delta L_{G,R} LAB_{G,R}^{\rho S_{G,R}} + \delta K_{G,R} CAP_{G,R}^{\rho S_{G,R}} \right)^{\frac{-1}{\rho S_{G,R}}} \quad (P1)$$

Demand for labor services:

$$LAB_{G,R} = \lambda_{G,R}^{\sigma S_{G,R}-1} \cdot QST_{G,R} \cdot \left( \frac{\delta L \cdot PVA_{G,R}}{WAG_R} \right)^{\sigma S_{G,R}} \quad (P2)$$

Demand for capital services

$$CAP_{G,R} = \lambda_{G,R}^{\sigma S_{G,R}-1} \cdot QST_{G,R} \cdot \left( \frac{\delta K \cdot PVA_{G,R}}{REN_R} \right)^{\sigma S_{G,R}} \quad (P3)$$

Price of value added:

$$PVA_{G,R} = PST_{G,R} - \sum_{GJ} io_{GJ,G,R} \cdot P_{GJ,R} \quad (P4)$$

Demand for intermediate input:

$$QINT_{G,R} = \sum_{GJ} io_{G,GJ,R} \cdot QST_{GJ,R} \quad (P5)$$

### Inter-economy and closure

Composite price of internal demand:

$$PD_{G,R} \cdot QD_{G,R} = PH_{G,R} \cdot QDH_{G,R} + PDRF_{G,R} \cdot QDRF_{G,R} \quad (T1)$$

Demand for external component of internal demand:

$$QDRF_{G,R} = QD_{G,R} \cdot \left( \frac{\delta DRF_{G,R} \cdot PD_{G,R}}{PDRF_{G,R}} \right)^{\sigma D_{G,R}} \quad (T2)$$

Demand for home component of internal demand:

$$QDH_{G,R} = QD_{G,R} \cdot \left( \frac{\delta DH_{G,R} \cdot PD_{G,R}}{PH_{G,R}} \right)^{\sigma D_{G,R}} \quad (T3)$$

Composite price of external component of internal demand:

$$PDRF_{G,R} \cdot QDRF_{G,R} = PDR_{G,R} \cdot QDR_{G,R} + PM_G \cdot QDF_{G,R} \quad (T4)$$

Demand for regional aggregate:

$$QDR_{G,R} = QDRF_{G,R} \cdot \left( \frac{\delta DR_{G,R} \cdot PDRF_{G,R}}{PDR_{G,R}} \right)^{\sigma DRF_{G,R}} \quad (T5)$$

Demand for import good

$$QDF_{G,R} = QDRF_{G,R} \cdot \left( \frac{\delta DF_{G,R} \cdot PDRF_{G,R}}{PM_G} \right)^{\sigma DRF_{G,R}} \quad (T6)$$

Import price in pesos:

$$PM_G = pwm_G \cdot (1 + txm_G) \cdot ER \quad (T7)$$

Composite price of regional aggregate:

$$PDR_{G,R} \cdot QDR_{G,R} = \sum_{RJ} PR_{G,R,RJ} \cdot QDRR_{G,R,RJ} \quad (T8)$$

Price of components of regional aggregate:

$$PR_{G,R,RJ} = P_{G,RJ} + tc_{G,R,RJ} \cdot PTC_R \quad (T9)$$

Demand for components of regional aggregate

$$QDRR_{G,R,RJ} = QDR_{G,R} \cdot \left( \frac{\delta DRR_{G,R,RJ} \cdot PDR_{G,R}}{PR_{G,R,RJ}} \right)^{\sigma DR_{G,R}} \quad (T10)$$

Quantity demanded, transaction good in region  $R$ , for sector  $G$ , from region  $RJ$

$$QTCG_{G,R,RJ} = tc_{G,R,RJ} \cdot QDRR_{G,R,RJ} \quad (T11)$$

Total quantity demanded, transaction good in region  $R$

$$QTC_R = \sum_{RJ} \sum_G QTCG_{G,R,RJ} \quad (T12)$$

Price of transaction good

$$PTC_R = P_{G,R}; G = Trans \quad (T13)$$

Price of gross output

$$PST_{G,R} \cdot QST_{G,R} = PS_{G,R} \cdot QS_{G,R} + \sum_{RJ} PD_{G,R} \cdot QDRR_{G,RJ,R} \quad (T14)$$

Price of CET supply composite

$$PS_{G,R} \cdot QS_{G,R} = PH_{G,R} \cdot QSH_{G,R} + PX_{G,R} \cdot QSF_{G,R} \quad (T15)$$

Quantity of CET supply composite

$$QS_{G,R} = QST_{G,R} - \sum_{RJ} QDRR_{G,RJ,R} \quad (T16)$$

Quantity of home component of CET composite

$$QSH_{G,R} = QS_{G,R} \cdot \left( \frac{\delta SH_{G,R} \cdot PS_{G,R}}{PH_{G,R}} \right)^{\sigma_{S_{G,R}}} \quad (T17)$$

Quantity of export component of CET composite

$$QSF_{G,R} = QS_{G,R} \cdot \left( \frac{\delta SF_{G,R} \cdot PS_{G,R}}{PX_G} \right)^{\sigma_{S_{G,R}}} \quad (T18)$$

Price of export good

$$PX_G = pwx_G \cdot ER \quad (T19)$$

Market price

$$P_{G,R} = PD_{G,R} \cdot (1 + txb_{G,R}) \quad (T20)$$

Market clearing wage

$$\sum_G LAB_{G,R} = labe_R \quad (T21)$$

Market clearing rental

$$\sum_G CAP_{G,R} = cape_R \quad (T22)$$

Market clearing in the home component

$$QDH_{G,R} = QSH_{G,R} \quad (T23)$$

Equilibrium foreign savings

$$\sum_R FSAV_R = fsavn \quad (T24)$$



Market price index	
$CPI_R = \sum_G rsh_{G,R} \cdot P_{G,R}$	(T25)
Price normalization	
$\sum_R shr_R \cdot CPI_R = cpib$	(T26)
Regional Gross Domestic Product	(T27)
$RGDP_R = \sum_H Y_{H,R} + \sum_G txb_{G,R} \cdot PD_{G,R} \cdot QDT_{G,R}$	

### *Derivation of supply expression with productivity parameter*

Conditional demand is derived from the cost minimization problem as follows:

$$\underset{K,L}{\text{Min}} C = wL + rK \quad \text{s.t.} \quad Q = \lambda \phi^{\frac{-1}{\rho}},$$

where the elasticity of substitution  $\sigma$  is given by  $\sigma = \frac{1}{1+\rho}$  or  $\rho = \frac{1-\sigma}{\sigma}$ , and

$\phi = \delta_L L^{-\rho} + \delta_K K^{-\rho}$ . Form the Lagrangian:

$$Z = wL + rK + \mu(Q_0 - \lambda \phi^{-1/\rho}),$$

with  $\mu$  as the constraint multiplier. Differentiation yields:

$$w = \mu \lambda \phi(K, L)^{\frac{-1}{\rho}-1} \delta_L L^{-\rho-1}, \quad r = \mu \lambda \phi(K, L)^{\frac{-1}{\rho}-1} \delta_K K^{-\rho-1}.$$

Multiplying by the respective factors and adding together:

$$wL + rK = C = \mu Q$$

Using the composite price identity  $PVA \cdot Q = wL + rK$ , we obtain  $PVA = \mu$ . Furthermore,

$\phi(K, L) = \lambda^\rho Q^{-\rho}$ . Therefore:

$$L = \lambda^{\sigma-1} \delta_L^\sigma \left( \frac{w}{PVA} \right)^{-\sigma} Q$$

$$K = \lambda^{\sigma-1} \delta_K^\sigma \left( \frac{r}{PVA} \right)^{-\sigma} Q.$$

## Regional SAMs

**Table 0-1: Regional SAM for Mluz (in '000,000 pesos)**

	Cereals-Act	Lvpoul-Act	Fish-Act	Othagri-Act	Agroproc-Act	Othind-Act	Trans-Act	Othserv-Act	Cereals	Lvpoul	Fish
Cereals-Act	0	0	0	0	0	0	0	0	42,682	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	133,840	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	45,103
Othagri-Act	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0	0
Cereals	270	182	0	0	30	46,753	44	5	0	0	0
Lvpoul	0	2,279	0	0	16	110,509	41	47	0	0	0
Fish	0	0	106	0	37	4,192	11	40	0	0	0
Othagri	581	642	85	3,865	302	45,311	126	191	0	0	0
Agroproc	0	28,128	1,381	0	2,357	575,371	4,936	9,096	0	0	0
Othind	14,146	18,671	5,049	55,992	216,376	568,351	37,759	37,196	0	0	0
Trans	247	799	147	1,694	12,316	62,144	3,629	1,287	0	0	0
Othserv	1,735	8,031	550	9,911	9,452	52,978	12,662	25,707	0	0	0
Mluz-trans	0	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Vis-trans	0	0	0	0	0	0	0	0	371.77	260.22	52.51
Minda-trans	0	0	0	0	0	0	0	0	1,051.95	736.29	173.33
Lab	17,594	30,328	25,887	10,644	94,984	33,006	115,634	169,244	0	0	0
Cap	8,110	44,781	11,898	7,018	502,159	89,028	346,611	632,129	0	0	0
House	0	0	0	0	0	0	0	0	0	0	0
Gov	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0
Tax-inc	0	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	440.948	1,625	1,620
Mluz	0	0	0	0	0	0	0	0	0.000	0	0
Othluz	0	0	0	0	0	0	0	0	0.000	0	0
Vis	0	0	0	0	0	0	0	0	1,858.869	1,301	875
Minda	0	0	0	0	0	0	0	0	5,259.732	3,681	2,476
Tax-trade	0	0	0	0	0	0	0	0	1,615.953	297	13
Foreign	0	0	0	0	0	0	0	0	8,165.710	1,230	165

Table 2-1 (Contd)

	Othagri	Agroproc	Othind	Trans	Othserv	Mluz-trans	Othluz-trans	Vis-trans	Minda-trans	Lab	Cap	House
Cereals-Act	0	0	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	0	0
Othagri-Act	89,123	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	838,030	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	1,587,645	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	521,453	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	874,942	0	0	0	0	0	0	0
Cereals	0	0	0	0	0	0	0	0	0	0	0	2,160
Lvpoul	0	0	0	0	0	0	0	0	0	0	0	13,718
Fish	0	0	0	0	0	0	0	0	0	0	0	35,335
Othagri	0	0	0	0	0	0	0	0	0	0	0	31,381
Agroproc	0	0	0	0	0	0	0	0	0	0	0	257,182
Othind	0	0	0	0	0	0	0	0	0	0	0	199,734
Trans	0	0	0	0	0	0	995	2,627	6,554	0	0	455,329
Othserv	0	0	0	0	0	0	0	0	0	0	0	532,091
Mluz-trans	0	0	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0.00	543.22	451.51	0	0	0	0	0	0	0	0	0
Vis-trans	363.24	647.16	931.64	0	0	0	0	0	0	0	0	0
Minda-trans	1,027.80	1,911.61	1,653.22	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0	0	0
House	0	0	0	0	0	0	0	0	0	497,322	1,641,733	0
Gov	0	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0	524,843
Tax-inc	0	0	0	0	0	0	0	0	0	0	0	136,426
Tax-bus	459	41,690	6,113	14,734	32,561	0	0	0	0	0	0	0
Mluz	0	0	0	0	0	0	0	0	0	0	0	0
Othluz	0	2,362	3,225	0	0	0	0	0	0	0	0	0
Vis	1,211	2,696	6,655	0	0	0	0	0	0	0	0	0
Minda	3,426	7,646	11,021	0	0	0	0	0	0	0	0	0
Tax-trade	475	6,003	55,082	0	0	0	0	0	0	0	0	0
Foreign	6,966	34,279	718,144	79,929	75,182	0	0	0	0	0	0	0

Table 2-1 (Contd)

	Gov	Savin	Tax-inc	Tax-bus	Mluz	Othluz	Vis	Minda	Tax-trade	Foreign
Cereals-Act	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0
Othagri-Act	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0
Cereals	0	4,279	0	0	0	717	4,211	2,757	0	41
Lvpoul	0	10,936	0	0	0	502	2,947	1,929	0	46
Fish	0	517	0	0	0	338	1,982	1,298	0	6,622
Othagri	0	4,702	0	0	0	467	2,743	1,796	0	10,860
Agroproc	0	3,890	0	0	0	1,268	10,792	9,697	0	31,709
Othind	0	258,692	0	0	0	4,331	30,599	29,663	0	914,363
Trans	0	18,134	0	0	0	0	0	0	0	50,214
Othserv	253,704	0	0	0	0	0	0	0	0	75,863
Mluz-trans	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0	0	0	0	0	0	0	0	0	0
Vis-trans	0	0	0	0	0	0	0	0	0	0
Minda-trans	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0
House	37,282	0	0	0	0	0	0	0	0	11,863
Gov	0	0	136,426	99,243	0	0	0	0	63,486	1,588
Savin	9,756	0	0	0	0	-2,036	-38,677	-13,629	0	-179,108
Tax-inc	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	0	0
Mluz	0	0	0	0	0	0	0	0	0	0
Othluz	0	0	0	0	0	0	0	0	0	0
Vis	0	0	0	0	0	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	0	0
Tax-trade	0	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0	0

**Table 0-2: Regional SAM for Othluz (in '000,000 pesos)**

	Cereals-Act	Lvpoul-Act	Fish-Act	Othagri-Act	Agroproc-Act	Othind-Act	Trans-Act	Othserv-Act	Cereals	Lvpoul	Fish
Cereals-Act	0	0	0	0	0	0	0	0	56,769	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	35,782	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	16,505
Othagri-Act	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0	0
Cereals	6,257	123	0	0	620	47,086	2,681	506	0	0	0
Lvpoul	0	364	0	0	75	26,171	598	1,116	0	0	0
Fish	0	0	180	0	19	107	18	102	0	0	0
Othagri	2,237	72	951	4,216	1,022	7,568	1,279	3,206	0	0	0
Agroproc	0	506	2,457	0	1,273	15,354	8,029	24,437	0	0	0
Othind	2,523	97	2,604	2,829	33,889	4,398	17,813	28,980	0	0	0
Trans	370	35	639	721	16,244	4,050	14,417	8,447	0	0	0
Othserv	337	46	310	546	1,614	447	6,514	21,843	0	0	0
Mluz-trans	0	0	0	0	0	0	0	0	143	95	17
Othluz-trans	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Vis-trans	0	0	0	0	0	0	0	0	26.08	18.25	3.68
Minda-trans	0	0	0	0	0	0	0	0	33.97	23.78	5.60
Lab	44,978	25,002	6,024	22,319	28,302	2,473	25,487	63,221	0	0	0
Cap	67	9,536	3,339	2,252	57,010	17,000	39,293	50,781	0	0	0
House	0	0	0	0	0	0	0	0	0	0	0
Gov	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0
Tax-inc	0	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	283.584	257	173
Mluz	0	0	0	0	0	0	0	0	717.152	502	338
Othluz	0	0	0	0	0	0	0	0	0.000	0	0
Vis	0	0	0	0	0	0	0	0	130.378	91	61
Minda	0	0	0	0	0	0	0	0	169.847	119	80
Tax-trade	0	0	0	0	0	0	0	0	299.977	55	2
Foreign	0	0	0	0	0	0	0	0	1,515.841	228	31

Table 2-2 (Contd)

	Othagri	Agroproc	Othind	Trans	Othserv	Mluz-trans	Othluz-trans	Vis-trans	Minda-trans	Lab	Cap	House
Cereals-Act	0	0	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	0	0
Othagri-Act	32,883	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	140,068	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	124,654	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	116,128	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	202,638	0	0	0	0	0	0	0
Cereals	0	0	0	0	0	0	0	0	0	0	0	1,327
Lvpoul	0	0	0	0	0	0	0	0	0	0	0	5,440
Fish	0	0	0	0	0	0	0	0	0	0	0	16,287
Othagri	0	0	0	0	0	0	0	0	0	0	0	12,885
Agroproc	0	0	0	0	0	0	0	0	0	0	0	105,601
Othind	0	0	0	0	0	0	0	0	0	0	0	64,669
Trans	0	0	0	0	0	1,121	0	184	212	0	0	78,892
Othserv	0	0	0	0	0	0	0	0	0	0	0	130,024
Mluz-trans	140	292	433	0	0	0	0	0	0	0	0	0
Othluz-trans	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Vis-trans	25.48	45.39	65.34	0	0	0	0	0	0	0	0	0
Minda-trans	33.19	61.73	53.39	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0	0	0
House	0	0	0	0	0	0	0	0	0	217,805	179,278	0
Gov	0	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0	-32,966
Tax-inc	0	0	0	0	0	0	0	0	0	0	0	24,047
Tax-bus	258	13,343	317	1,650	2,142	0	0	0	0	0	0	0
Mluz	467	1,268	4,331	0	0	0	0	0	0	0	0	0
Othluz	0	0	0	0	0	0	0	0	0	0	0	0
Vis	85	189	467	0	0	0	0	0	0	0	0	0
Minda	111	247	356	0	0	0	0	0	0	0	0	0
Tax-trade	88	1,114	10,225	0	0	0	0	0	0	0	0	0
Foreign	1,293	6,363	133,313	14,838	13,956	0	0	0	0	0	0	0

Table 2-2 (Contd)

	Gov	Savin	Tax-inc	Tax-bus	Mluz	Othluz	Vis	Minda	Tax-trade	Foreign
Cereals-Act	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0
Othagri-Act	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0
Cereals	0	1,274	0	0	0	0	134	79	0	2
Lvpoul	0	3,257	0	0	0	0	94	56	0	2
Fish	0	154	0	0	0	0	63	37	0	249
Othagri	0	1,400	0	0	0	0	87	52	0	408
Agroproc	0	1,158	0	0	2,362	0	344	279	0	1,190
Othind	0	77,036	0	0	3,225	0	975	855	0	34,321
Trans	0	5,400	0	0	0	0	0	0	0	1,885
Othserv	54,207	0	0	0	0	0	0	0	0	2,848
Mluz-trans	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0	0	0	0	0	0	0	0	0	0
Vis-trans	0	0	0	0	0	0	0	0	0	0
Minda-trans	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0
House	6,921	0	0	0	0	0	0	0	0	2,202
Gov	0	0	24,047	18,423	0	0	0	0	11,785	295
Savin	-6,579	0	0	0	2,036	0	-674	-276	0	128,138
Tax-inc	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	0	0
Mluz	0	0	0	0	0	0	0	0	0	0
Othluz	0	0	0	0	0	0	0	0	0	0
Vis	0	0	0	0	0	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	0	0
Tax-trade	0	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0	0

**Table 0-3: Regional SAM for Vis (in '000,000 pesos)**

	Cereals-Act	Lvpoul-Act	Fish-Act	Othagri-Act	Agroproc-Act	Othind-Act	Trans-Act	Othserv-Act	Cereals	Lvpoul	Fish			
Cereals-Act	0	0	0	0	0	0	0	0	32,420	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	111,991	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	57,806	0	0	0
Othagri-Act	0	0	0	0	0	0	0	0	0	0	0	38,574	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0	0	0	274,164	0
Othind-Act	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cereals	87	1,103	0	0	243	35,214	1,048	11	0	0	0	0	0	0
Lvpoul	0	15,107	0	0	136	90,823	1,085	115	0	0	0	0	0	0
Fish	0	0	14,338	0	1,771	18,893	1,621	538	0	0	0	0	0	0
Othagri	103	2,151	1,065	363	1,334	18,840	1,665	238	0	0	0	0	0	0
Agroproc	0	41,290	7,541	0	4,554	104,725	28,634	4,969	0	0	0	0	0	0
Othind	132	3,295	3,314	277	50,259	12,437	26,335	2,443	0	0	0	0	0	0
Trans	33	2,034	1,394	121	41,296	19,631	36,538	1,221	0	0	0	0	0	0
Othserv	5	429	109	15	664	351	2,670	511	0	0	0	0	0	0
Mluz-trans	0	0	0	0	0	0	0	0	842	560	119	823	2,482	4
Othluz-trans	0	0	0	0	0	0	0	0	26.84	17.85	3.79	26.22	79.11	13
Vis-trans	0	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Minda-trans	0	0	0	0	0	0	0	0	459.76	321.80	64.93	449.21	929.82	1,92
Lab	19,358	15,972	20,387	24,620	34,930	9,517	49,120	106,481	0	0	0	0	0	0
Cap	12,702	30,609	9,658	13,179	138,976	27,807	72,508	108,478	0	0	0	0	0	0
House	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gov	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tax-inc	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	1,101.466	1,723	570	873	16,430	0
Mluz	0	0	0	0	0	0	0	0	4,210.765	2,947	1,982	2,743	10,792	30
Othluz	0	0	0	0	0	0	0	0	134.199	94	63	87	344	0
Vis	0	0	0	0	0	0	0	0	0.000	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	2,298.787	1,609	1,082	1,497	4,043	12
Tax-trade	0	0	0	0	0	0	0	0	524.511	96	4	154	1,948	17
Foreign	0	0	0	0	0	0	0	0	2,650.453	399	54	2,261	11,126	233



Table 2-2 (Contd)

	Othagri	Agroproc	Othind	Trans	Othserv	Mluz-trans	Othluz-trans	Vis-trans	Minda-trans	Lab	Cap	House
Cereals-Act	0	0	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	0	0
Othagri-Act	38,574	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	274,164	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	338,236	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	221,225	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	225,005	0	0	0	0	0	0	0
Cereals	0	0	0	0	0	0	0	0	0	0	0	1,530
Lvpoul	0	0	0	0	0	0	0	0	0	0	0	4,014
Fish	0	0	0	0	0	0	0	0	0	0	0	20,759
Othagri	0	0	0	0	0	0	0	0	0	0	0	13,533
Agroproc	0	0	0	0	0	0	0	0	0	0	0	110,911
Othind	0	0	0	0	0	0	0	0	0	0	0	74,588
Trans	0	0	0	0	0	9,110	290	0	4,154	0	0	109,036
Othserv	0	0	0	0	0	0	0	0	0	0	0	162,560
Mluz-trans	823	2,482	4,284	0	0	0	0	0	0	0	0	0
Othluz-trans	26.22	79.11	136.53	0	0	0	0	0	0	0	0	0
Vis-trans	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Minda-trans	449.21	929.82	1,928.12	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0	0	0
House	0	0	0	0	0	0	0	0	0	280,384	413,918	0
Gov	0	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0	192,019
Tax-inc	0	0	0	0	0	0	0	0	0	0	0	21,303
Tax-bus	873	16,430	857	4,718	5,941	0	0	0	0	0	0	0
Mluz	2,743	10,792	30,599	0	0	0	0	0	0	0	0	0
Othluz	87	344	975	0	0	0	0	0	0	0	0	0
Vis	0	0	0	0	0	0	0	0	0	0	0	0
Minda	1,497	4,043	12,854	0	0	0	0	0	0	0	0	0
Tax-trade	154	1,948	17,879	0	0	0	0	0	0	0	0	0
Foreign	2,261	11,126	233,097	25,944	24,403	0	0	0	0	0	0	0

Table 2-2 (Contd)

	Gov	Savin	Tax-inc	Tax-bus	Mluz	Othluz	Vis	Minda	Tax-trade	Foreign
Cereals-Act	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0
Othagri-Act	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0
Cereals	0	2,516	0	0	1,859	130	0	913	0	13
Lvpoul	0	6,432	0	0	1,301	91	0	639	0	15
Fish	0	304	0	0	875	61	0	430	0	2,158
Othagri	0	2,765	0	0	1,211	85	0	595	0	3,539
Agroproc	0	2,288	0	0	2,696	189	0	4,208	0	10,333
Othind	0	152,139	0	0	6,655	467	0	10,537	0	297,970
Trans	0	10,665	0	0	0	0	0	0	0	16,364
Othserv	63,314	0	0	0	0	0	0	0	0	24,722
Mluz-trans	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0	0	0	0	0	0	0	0	0	0
Vis-trans	0	0	0	0	0	0	0	0	0	0
Minda-trans	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0
House	12,101	0	0	0	0	0	0	0	0	3,850
Gov	0	0	21,303	32,213	0	0	0	0	20,606	515
Savin	-778	0	0	0	38,677	674	0	6,062	0	-59,545
Tax-inc	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	0	0
Mluz	0	0	0	0	0	0	0	0	0	0
Othluz	0	0	0	0	0	0	0	0	0	0
Vis	0	0	0	0	0	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	0	0
Tax-trade	0	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0	0

**Table 0-4: Regional SAM for Minda (in '000,000 pesos)**

	Cereals-Act	Lvpoul-Act	Fish-Act	Othagri-Act	Agroproc-Act	Othind-Act	Trans-Act	Othserv-Act	Cereals	Lvpoul	Fish
Cereals-Act	0	0	0	0	0	0	0	0	60,314	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	63,942	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	38,724
Othagri-Act	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0	0
Cereals	580	317	0	0	28	58,531	344	41	0	0	0
Lvpoul	0	1,566	0	0	6	54,458	129	151	0	0	0
Fish	0	0	115	0	89	13,926	236	867	0	0	0
Othagri	1,050	941	29	2,808	231	47,679	832	1,316	0	0	0
Agroproc	0	4,915	57	0	214	72,105	3,894	7,477	0	0	0
Othind	3,834	4,109	261	6,102	24,754	89,709	37,522	38,512	0	0	0
Trans	186	488	21	512	3,911	27,227	10,010	3,700	0	0	0
Othserv	53	198	3	121	121	936	1,409	2,980	0	0	0
Mluz-trans	0	0	0	0	0	0	0	0	551	386	91
Othluz-trans	0	0	0	0	0	0	0	0	15.89	11.12	2.62
Vis-trans	0	0	0	0	0	0	0	0	172.56	95.86	21.49
Minda-trans	0	0	0	0	0	0	0	0	0.00	0.00	0.00
Lab	40,020	19,443	15,993	41,316	41,086	4,294	34,818	73,491	0	0	0
Cap	14,593	31,965	22,245	18,265	109,922	28,108	61,064	94,618	0	0	0
House	0	0	0	0	0	0	0	0	0	0	0
Gov	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0
Tax-inc	0	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	2,953.713	1,682	784
Mluz	0	0	0	0	0	0	0	0	2,756.680	1,929	1,298
Othluz	0	0	0	0	0	0	0	0	79.432	56	37
Vis	0	0	0	0	0	0	0	0	913.012	639	430
Minda	0	0	0	0	0	0	0	0	0.000	0	0
Tax-trade	0	0	0	0	0	0	0	0	491.980	90	4
Foreign	0	0	0	0	0	0	0	0	2,486.067	374	50

Table 2-1 (Contd)

	Othagri	Agroproc	Othind	Trans	Othserv	Mluz-trans	Othluz-trans	Vis-trans	Minda-trans	Lab	Cap	House
Cereals-Act	0	0	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0	0	0
Othagri-Act	69,125	0	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	180,361	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	396,975	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	150,258	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	223,153	0	0	0	0	0	0	0
Cereals	0	0	0	0	0	0	0	0	0	0	0	1,662
Lvpoul	0	0	0	0	0	0	0	0	0	0	0	3,661
Fish	0	0	0	0	0	0	0	0	0	0	0	20,321
Othagri	0	0	0	0	0	0	0	0	0	0	0	13,596
Agroproc	0	0	0	0	0	0	0	0	0	0	0	111,422
Othind	0	0	0	0	0	0	0	0	0	0	0	75,170
Trans	0	0	0	0	0	8,441	232	2,911	0	0	0	97,776
Othserv	0	0	0	0	0	0	0	0	0	0	0	153,098
Mluz-trans	539	2,424	4,449	0	0	0	0	0	0	0	0	0
Othluz-trans	15.52	67.06	119.66	0	0	0	0	0	0	0	0	0
Vis-trans	178.41	967.93	1,475.23	0	0	0	0	0	0	0	0	0
Minda-trans	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0	0	0
House	0	0	0	0	0	0	0	0	0	270,460	380,779	0
Gov	0	0	0	0	0	0	0	0	0	0	0	0
Savin	0	0	0	0	0	0	0	0	0	0	0	175,717
Tax-inc	0	0	0	0	0	0	0	0	0	0	0	13,778
Tax-bus	3,983	13,013	499	2,828	4,472	0	0	0	0	0	0	0
Mluz	1,796	9,697	29,663	0	0	0	0	0	0	0	0	0
Othluz	52	279	855	0	0	0	0	0	0	0	0	0
Vis	595	4,208	10,537	0	0	0	0	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	0	0	0	0
Tax-trade	145	1,828	16,770	0	0	0	0	0	0	0	0	0
Foreign	2,121	10,436	218,640	24,335	22,889	0	0	0	0	0	0	0

Table 2-1 (Contd)

	Gov	Savin	Tax-inc	Tax-bus	Mluz	Othluz	Vis	Minda	Tax-trade	Foreign
Cereals-Act	0	0	0	0	0	0	0	0	0	0
Lvpoul-Act	0	0	0	0	0	0	0	0	0	0
Fish-Act	0	0	0	0	0	0	0	0	0	0
Othagri-Act	0	0	0	0	0	0	0	0	0	0
Agroproc-Act	0	0	0	0	0	0	0	0	0	0
Othind-Act	0	0	0	0	0	0	0	0	0	0
Trans-Act	0	0	0	0	0	0	0	0	0	0
Othserv-Act	0	0	0	0	0	0	0	0	0	0
Cereals	0	1,491	0	0	5,260	170	2,299	0	0	13
Lvpoul	0	3,812	0	0	3,681	119	1,609	0	0	14
Fish	0	180	0	0	2,476	80	1,082	0	0	2,069
Othagri	0	1,639	0	0	3,426	111	1,497	0	0	3,392
Agroproc	0	1,356	0	0	7,646	247	4,043	0	0	9,905
Othind	0	90,163	0	0	11,021	356	12,854	0	0	285,615
Trans	0	6,320	0	0	0	0	0	0	0	15,685
Othserv	67,899	0	0	0	0	0	0	0	0	23,697
Mluz-trans	0	0	0	0	0	0	0	0	0	0
Othluz-trans	0	0	0	0	0	0	0	0	0	0
Vis-trans	0	0	0	0	0	0	0	0	0	0
Minda-trans	0	0	0	0	0	0	0	0	0	0
Lab	0	0	0	0	0	0	0	0	0	0
Cap	0	0	0	0	0	0	0	0	0	0
House	11,351	0	0	0	0	0	0	0	0	3,612
Gov	0	0	13,778	30,215	0	0	0	0	19,328	483
Savin	-15,446	0	0	0	13,629	276	-6,062	0	0	-63,153
Tax-inc	0	0	0	0	0	0	0	0	0	0
Tax-bus	0	0	0	0	0	0	0	0	0	0
Mluz	0	0	0	0	0	0	0	0	0	0
Othluz	0	0	0	0	0	0	0	0	0	0
Vis	0	0	0	0	0	0	0	0	0	0
Minda	0	0	0	0	0	0	0	0	0	0
Tax-trade	0	0	0	0	0	0	0	0	0	0
Foreign	0	0	0	0	0	0	0	0	0	0

## Additional Scenario results

**Table 0-1: Changes in other variables, Reform scenario (%)**

	Mluz	Othluz	Vis	Minda
INTER-REGIONAL IMPORTS - MLUZ				
Cereals	0.00	0.00	-2.21	-3.05
Lvpoul	0.00	0.00	-0.14	-0.06
Fish	0.00	0.00	-0.08	-0.11
Othagri	0.00	0.00	-0.20	-0.21
Agroproc	0.00	0.22	0.09	0.10
Othind	0.00	0.07	-0.05	-0.01
INTER-REGIONAL IMPORTS - OTHLUZ				
Cereals	3.26	0.00	1.32	0.44
Lvpoul	0.45	0.00	0.15	0.23
Fish	0.00	0.00	-0.13	-0.16
Othagri	0.27	0.00	-0.03	-0.04
Agroproc	0.07	0.00	-0.04	-0.03
Othind	0.04	0.00	-0.04	0.00
INTER-REGIONAL IMPORTS - VIS				
Cereals	2.08	-0.97	0.00	-0.70
Lvpoul	0.75	0.63	0.00	0.52
Fish	0.39	0.44	0.00	0.23
Othagri	0.59	0.41	0.00	0.28
Agroproc	0.38	0.40	0.00	0.28
Othind	0.23	0.28	0.00	0.19
INTER-REGIONAL IMPORTS - MINDA				
Cereals	3.09	0.01	1.17	0.00
Lvpoul	0.67	0.55	0.37	0.00
Fish	0.38	0.44	0.26	0.00
Othagri	0.67	0.49	0.37	0.00
Agroproc	0.33	0.35	0.22	0.00
Othind	0.18	0.23	0.12	0.00
DEMAND FOR REGIONAL COMPOSITE				
Cereals	-2.83	2.54	1.05	2.56
Lvpoul	-0.08	0.38	0.67	0.60
Fish	-0.10	-0.04	0.34	0.35
Othagri	-0.21	0.18	0.48	0.59
Agroproc	0.12	0.05	0.36	0.30
Othind	-0.01	0.03	0.22	0.16
WAGE	-0.01	-0.02	0.06	0.03
RENTAL	0.06	0.10	0.15	0.13
SAVINGS	-0.58	-0.05	0.08	-0.07
GOVERNMENT SAVINGS	-13.63	3.87	43.43	2.30
FOREIGN SAVINGS	0.09	0.17	-0.21	0.29

**Table 0-2: Changes in other variables, Catch-up investment scenario (%)**

	Mluz	Othluz	Vis	Minda
<b>INTER-REGIONAL IMPORTS - MLUZ</b>				
Cereals	0.00	0.00	6.53	6.16
Lvpoul	0.00	0.00	7.24	6.81
Fish	0.00	0.00	2.01	1.93
Othagri	0.00	0.00	9.38	9.16
Agroproc	0.00	8.63	8.78	8.57
Othind	0.00	5.62	6.04	6.16
<b>INTER-REGIONAL IMPORTS - OTHLUZ</b>				
Cereals	2.52	0.00	8.58	8.20
Lvpoul	1.77	0.00	8.47	8.04
Fish	0.52	0.00	2.41	2.37
Othagri	2.42	0.00	11.44	11.21
Agroproc	1.20	0.00	9.61	9.42
Othind	1.08	0.00	6.61	6.78
<b>INTER-REGIONAL IMPORTS - VIS</b>				
Cereals	2.68	8.59	0.00	8.37
Lvpoul	1.99	8.16	0.00	8.27
Fish	1.48	3.86	0.00	2.88
Othagri	3.00	12.25	0.00	11.83
Agroproc	1.78	10.04	0.00	9.38
Othind	1.02	5.94	0.00	6.53
<b>INTER-REGIONAL IMPORTS - MINDA</b>				
Cereals	2.31	8.18	7.96	0.00
Lvpoul	1.73	8.19	6.58	0.00
Fish	1.45	4.18	2.83	0.00
Othagri	2.65	11.86	11.67	0.00
Agroproc	1.83	10.34	9.86	0.00
Othind	1.17	6.05	6.47	0.00
<b>DEMAND FOR REGIONAL COMPOSITE</b>				
Cereals	6.26	4.23	4.75	3.78
Lvpoul	6.92	3.66	4.28	3.00
Fish	1.95	1.07	2.01	1.84
Othagri	9.22	5.01	6.20	5.01
Agroproc	8.62	3.32	3.97	4.32
Othind	6.04	2.00	2.71	2.61
WAGE	0.32	0.48	0.75	0.73
RENTAL	0.32	0.33	0.87	0.68
SAVINGS	2.26	0.17	-0.05	0.05
GOVERNMENT SAVINGS	13.24	-4.46	-74.40	-3.17
FOREIGN SAVINGS	-0.98	0.26	4.38	-0.82

**Table 0-3: Changes in over variables, Concentration investment scenario (%)**

	Mluz	Othluz	Vis	Minda
<b>INTER-REGIONAL IMPORTS - MLUZ</b>				
Cereals	0.00	0.00	2.16	1.83
Lvpoul	0.00	0.00	2.27	2.21
Fish	0.00	0.00	1.77	1.71
Othagri	0.00	0.00	2.83	2.55
Agroproc	0.00	2.50	2.45	2.62
Othind	0.00	2.26	2.61	2.69
<b>INTER-REGIONAL IMPORTS - OTHLUZ</b>				
Cereals	6.60	0.00	0.38	0.06
Lvpoul	5.87	0.00	0.04	-0.02
Fish	0.61	0.00	-0.33	-0.45
Othagri	9.33	0.00	0.10	-0.17
Agroproc	6.96	0.00	-0.08	0.04
Othind	3.16	0.00	0.32	0.35
<b>INTER-REGIONAL IMPORTS - VIS</b>				
Cereals	7.07	0.66	0.00	0.49
Lvpoul	6.76	1.02	0.00	0.81
Fish	1.81	0.82	0.00	0.36
Othagri	9.77	0.44	0.00	0.22
Agroproc	7.55	0.55	0.00	0.58
Othind	4.25	-0.28	0.00	0.08
<b>INTER-REGIONAL IMPORTS - MINDA</b>				
Cereals	7.17	0.75	0.92	0.00
Lvpoul	6.79	0.76	0.61	0.00
Fish	2.11	0.75	0.41	0.00
Othagri	10.03	0.68	0.74	0.00
Agroproc	7.84	0.28	0.18	0.00
Othind	4.60	-0.27	0.07	0.00
<b>DEMAND FOR REGIONAL COMPOSITE</b>				
Cereals	1.91	4.69	4.64	5.50
Lvpoul	2.23	4.12	4.56	5.19
Fish	1.73	0.31	1.29	1.67
Othagri	2.62	6.52	6.23	7.53
Agroproc	2.56	5.14	5.51	5.42
Othind	2.60	2.69	2.93	3.33
WAGE	1.03	0.32	0.58	0.59
RENTAL	1.01	0.31	0.64	0.56
SAVINGS	3.59	0.30	0.11	0.09
GOVERNMENT SAVINGS	33.74	-2.41	-47.21	-1.89
FOREIGN SAVINGS	-4.22	-0.03	7.20	5.12



**Table 0-4: Changes in other variables, Reform with investment scenario (%)**

	Mluz	Othluz	Vis	Minda
<b>INTER-REGIONAL IMPORTS - MLUZ</b>				
Cereals	0.00	0.00	4.31	3.01
Lvpoul	0.00	0.00	7.11	6.77
Fish	0.00	0.00	1.94	1.83
Othagri	0.00	0.00	9.19	8.95
Agroproc	0.00	8.90	8.88	8.68
Othind	0.00	5.76	6.04	6.20
<b>INTER-REGIONAL IMPORTS - OTHLUZ</b>				
Cereals	5.82	0.00	10.07	8.69
Lvpoul	2.19	0.00	8.60	8.25
Fish	0.48	0.00	2.25	2.18
Othagri	2.67	0.00	11.38	11.14
Agroproc	1.25	0.00	9.53	9.37
Othind	1.06	0.00	6.52	6.73
<b>INTER-REGIONAL IMPORTS - VIS</b>				
Cereals	4.80	7.60	0.00	7.65
Lvpoul	2.75	8.88	0.00	8.84
Fish	1.87	4.34	0.00	3.12
Othagri	3.59	12.74	0.00	12.14
Agroproc	2.16	10.51	0.00	9.69
Othind	1.14	6.17	0.00	6.65
<b>INTER-REGIONAL IMPORTS - MINDA</b>				
Cereals	5.46	8.26	9.31	0.00
Lvpoul	2.40	8.82	6.99	0.00
Fish	1.83	4.66	3.09	0.00
Othagri	3.33	12.44	12.09	0.00
Agroproc	2.16	10.75	10.10	0.00
Othind	1.33	6.31	6.59	0.00
<b>DEMAND FOR REGIONAL COMPOSITE</b>				
Cereals	3.35	6.84	5.84	6.45
Lvpoul	6.86	4.01	4.97	3.61
Fish	1.86	0.99	2.35	2.19
Othagri	9.01	5.16	6.69	5.62
Agroproc	8.76	3.33	4.33	4.63
Othind	6.08	1.96	2.84	2.76
WAGE	0.31	0.45	0.81	0.76
RENTAL	0.39	0.42	1.02	0.80
SAVINGS	1.85	-0.01	-0.15	-0.07
GOVERNMENT SAVINGS	-0.06	-0.36	-28.03	-0.83
FOREIGN SAVINGS	-1.12	0.36	4.61	-0.44