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# An applied general equilibrium analysis of fiscal reforms to fight poverty in Mexico[1][2]

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## Abstract

The main goal of this paper is to analyze the consequences of two alternative ways of raising funds to finance poverty alleviation programs in Mexico: A Value Added Tax (VAT) reform and a personal income tax reform (IT). The impact of the reforms is analyzed with an applied general equilibrium model of the Mexican economy, calibrated using a 1996 Social Accounting Matrix. The model includes 18 production sectors, 10 representative households, the government, and the rest of the world. The cash transfers required to attain a fixed increase in the Equivalent Variation (EV) of the lowest income households are obtained either increasing effective VAT rates or IT rates. When all rates are scaled up by the same factor, the VAT reform generates a positive global EV considerably larger than the one obtained scaling the IT rates, though the latter diminishes (increases) lower (higher) income households' contribution. Setting a uniform VAT rate results in a positive global EV considerably larger than the one obtained with a uniform IT. Moreover, the distribution gap increases in the latter case since the richest households receive the largest benefits.

***Key words*:** poverty alleviation, tax reforms, social accounting matrix, applied general equilibrium, equivalent variation.

## Resumen

El objetivo de este artículo es analizar las consecuencias de dos formas alternativas de recaudar fondos para financiar los programas de alivio a la pobreza en México: la reforma del Impuesto al Valor Agregado (IVA) y la reforma del Impuesto Sobre la Renta (ISR). El impacto de las reformas se

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analiza con un modelo de equilibrio general aplicado de la economía mexicana que ha sido calibrado sobre una matriz de contabilidad de 1996. El modelo incluye dieciocho sectores productivos, diez hogares representativos, el gobierno y el resto del mundo. Las transferencias directas necesarias para alcanzar un incremento fijo en la variación equivalente (VE) de los hogares de menores ingresos, se obtienen mediante el incremento a la tasa del IVA, o bien la del ISR. Cuando las tasas son escaladas por el mismo factor, la reforma del IVA genera una VE global positiva, considerablemente mayor que la que se obtiene escalando las tasas del ISR; aunque, ésta última disminuye (aumenta) las contribuciones de los hogares de menores (mayores) ingresos. El establecimiento de una tasa uniforme del IVA también resulta en una VE global positiva, considerablemente mayor que la que se obtiene con una tasa uniforme para el ISR. Y más aún, la brecha distributiva se incrementa en el último caso, puesto que los hogares más ricos reciben los más altos beneficios.

***Palabras clave*:** alivio a la pobreza, reformas impositivas, matriz de contabilidad social, equilibrio general aplicado, variación equivalente.
***Clasificación JEL*:** D58, I32, I38.

## Introduction[3]

Prudent calculations indicate that *per capita* daily expenditure of about 18 million Mexicans, out of a population of 92.6 million, was less than 10 current pesos in 1996, a figure very close to the conventional extreme poverty line set in 1 US$ per day.

Later, the Technical Committee for Mexico's Poverty Measurement (CTMPM, 2005) defined three poverty lines. In 2000, these lines were set at 626 current pesos per month for the Food poverty line, 769.98 for the Capacities poverty line, and 1,258.89 for the Patrimonial poverty line, which roughly amounts to 2.25, 2.76, and 4.52 U.S. dollars per day, respectively. According to this technical committee (dependent of the Ministry of Social Development) in 2000, 24.2% of the Mexican population was below the Food poverty line (23.67 million people).

More recently,[4] the National Council for the Evaluation of the Social Development Policy (Coneval), based on the National Survey of Households' Income-Expenditure (ENIGH-2005) stated that in 2005, 19 million Mexicans did not get the necessary income to access the basic food

[3] The authors acknowledge the observations made by two anonymous referees, to improve this paper. All errors remain our sole responsibility.
[4] In the newspaper: La Jornada, October 2nd, 2006.

basket. This means that 18.3% of total population was below the Food poverty line.

In order to palliate this pressing problem, the Federal Government started in October 1997 a pilot program, named PROGRESA, to eradicate extreme poverty in Mexico.[5] PROGRESA covered just over 400,000 poor rural families during its first year, but the number went up to 2.3 million in September 1999. During President Fox' Administration, the program, renamed OPORTUNIDADES, kept growing. In 2003, 4.24 million families living in 2,351 municipalities were beneficiaries. In August 2004, president Fox chaired a ceremony to welcome five million beneficiaries, a number close to the amount of families below the extreme poverty line.[6]

A peculiar feature of the program is that cash transfers to participants are conditioned to children's enrollment and assistance to primary and secondary school, as well as family (mainly mothers and children) participation in health control programs and nutrition and hygiene information sessions. The success of the program is pointed out by the fact that four out of every five households in poor alimentary conditions and three out of every four households poorly endowed received benefits in 2002. However, due to several reasons, no significant abatement of poverty has been observed, but this issue goes far beyond the scope of the present paper.

The main goal of this paper is to analyze the consequences of two alternative ways of raising funds to finance poverty alleviation programs in Mexico: a value added tax (VAT) reform and a personal income tax reform (IT). The impact of the reforms is analyzed with an applied general equilibrium model (AGEM) of the Mexican economy, calibrated using a 1996 social accounting matrix. Cash transfers required to attain a fixed increase in the equivalent variation (EV) of the lowest income households are obtained, either increasing effective VAT rates or IT rates. After that, we use the AGEM to obtain changes in welfare and other relevant variables, through simulations of the two mentioned reforms.

In our opinion, the analysis of how to finance poverty fighting is highly relevant, especially in Mexico, where extreme poverty has been, during decades, a hurtful reality for about 20% of Mexicans, and an already chronic stigma for the Mexican economy. This implies that, in order to solve the problem, Mexico cannot rely on external sources, but a sustainable policy must be designed to generate the necessary funds.

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[5] PROGRESA is the acronym of Programa Nacional de Educación, Salud y Alimentación, the Spanish name of the program.
[6] See, SEDESOL, 2003 and 2004.

The development of an algorithm to approximate a fixed point by Scarf [1973 and 1984], and its use by Shoven and Whalley [1972] to study the effects of taxes, marked the beginning of a rapid expansion of the AGE approach, to quantify impacts of fiscal reforms and trade policy on resources allocation and on welfare (Shoven and Whalley [1984]); and also, of higher interest for developing countries, to analyze policy effects on growth and income distribution, (Dervis, De Melo, and Robinson [1982]).

In Mexico, the first application of the AGE approach goes back to the work by Sidaoui and Sines [1979], focused on the analysis of the effects of distortions in factor markets. In the same year, Serra-Puche [1979] presented its Ph.D. dissertation with an AGE model to analyze fiscal reform, which was the basis of the MEGAMEX -a model sponsored by the Bank of Mexico- and of several papers: Kehoe and Serra-Puche [1983a, 1983b][7], Kehoe, Serra-Puche and Solís [1984], and Serra-Puche [1984]. The survey by Decaluwé and Martens [1988] includes, besides the papers by Kehoe and Serra-Puche, a model by Levy [1987] which introduces quantitative restrictions in trade, and the model by Gibson, Lustig, and Taylor [1985] with a Marxist approach.

Some other works analyze specific aspects of the tax system: Ayala [1985], Estrada [1987], Robles [1987], Ibarra [1988], and Apolonio [1992]. Trade policy: Hierro [1983], Sobarzo [1998, 1991], Guerrero, [1989], Pérez [1989], and Francois and Shiells [1994]. The rural sector: Adelman, Taylor, and Vogel [1988], Robinson, Burfisher, Hinojosa-Ojeda and Thierfelder [1991], and Taylor, Yúnez-Naude, and Hampton [1999].

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[7] The model by Kehoe and Serra-Puche (1983a) comprises 14 produced goods, 3 aggregated goods (public, exports, and investment), 15 final consumption goods, and 3 production factors: capital and urban and rural labor. Agents in the model are 5 rural and five urban representative Households, the Government, and the RoW. Production is constant returns to scale nested in three levels. Each Household owns endowments of capital and labor. Households' welfare derives from a Cobb-Douglas utility function on goods and savings (capital tomorrow); savings can be devoted to investment or public debt. Government revenues come from capital's share, and from production, imports, income, and value added taxes. Government's deficit is financed through public debt. RoW's revenue comes from imports, and it is used to buy exports, the difference between revenue and expenditures is the RoW's savings. In this model labor markets could not clear because of assumed frictions, generating unemployment. The model was calibrated to replicate the economy in 1977, and was mainly used to analyze the impact from introducing the VAT with several scenarios: Constant (variable) real urban wages, variable (constant) unemployment, and constant (variable) public deficit. The VAT rate used was 10%, except for agricultural products, food, educative materials, and professional services with 0%. Although they had interesting results, the authors conclude that the distributive policy impact crucially depends on the macroclosure, particularly, on whether the public deficit is kept constant or not.

There are studies that analyze cash transfer programs. Coady [2001], and Maldés, Coady and Maluccio [2004], have studied the cost effectiveness of cash transfer targeted programs in Mexico and other Latin America countries using a cost-benefit approach. Coady and Harris [2000], analyzed the welfare impact of cash transfer programs in Mexico using an applied general equilibrium model (AGEM) calibrated to a 1996 SAM. In this framework, Coady and Harris study the welfare consequences of two alternative ways to finance a 30% increase in poor rural households' nominal income. This amounts to a 2% of GDP. In the first place, all subsidies on manufactured maize, wheat and dairy products are eliminated and income lump sum taxes are adjusted to hold constant the Government deficit. Second, cash transfers to the poorest are financed using several schemes to raise value added tax (VAT) revenues keeping also constant the Government deficit. Actually, the second scenario was seriously considered by President Fox's Administration that publicized in 2003 an initiative –never implemented- to set a uniform 10% VAT rate

In line with these studies and government proposals, our paper provides estimates of the welfare effects of tax financed transfers programs using an AGEM of the Mexican economy. This AGEM is quite different from that of Coady and Harris (2000). It is a national model with 18 production sectors, 10 representative consumers, Government and the RoW. Moreover, the model is calibrated using a completely different, and disaggregated, social accounting matrix, the SAM-MX96, constructed for the base year 1996 (Núñez, G. [2004]).

This paper compares two VAT schemes to finance poverty alleviation programs, similar to those studied by Coady and Harris [2000], and two personal income tax (IRS) reforms, an alternative disregarded in their work. To evaluate the allocation and welfare impact of these reforms, percentage changes in activity and utility levels are calculated, as well as Hicks' equivalent variation (EV).

The approach followed to evaluate the policy reforms is also different from the approach used by Coady and Harris [2000]. The policy scenarios are chosen in order to generate a Government surplus that, once transferred to the poorest household decile, increases the EV of the poorest family in a fixed amount. The fiscal reforms considered are: rescaling all VAT rates or ISR rates, and setting a uniform VAT or a uniform ISR rate.

The paper is organized as follows. Section I presents the main features of the SAM-MX96 and section II those of the AGE model. Section III presents simulations and results. Finally, section IV concludes with some final remarks.

## I. The SAM-MX96

Table 1.1 shows the main blocks of the SAM-MX96, which disaggregates the circular income flow for the Mexican economy during 1996. We follow the usual convention by which rows account for "income", and columns for "expenditures".

As usual when preparing a SAM, we relied on an Input-Output Table (CIESA, [1996], and on Mexico's National Accounting System (SCNM)[8], as the main statistical sources. This information has been complemented with the "National Survey of Households' Income-Expenditure" (INEGI [1999b]) to workout the relationship between production and private consumption. In addition, the following sources were also used: "Federal Income Accounting" (SHCP [2001]); "Compendium of Fiscal Federal Laws" (Fisco Agenda 97 [1997]); "Annual Statistical Information, Exports/Imports, 1993-200" (Bancomext [2000]); and the "Annual Report, 1996" (Banxico [1996]).

The first account of the SAM-MX96, disaggregates total population into 10 representative Households, defined by income decile, this income comes from Transfers, Labor, and Capital. Households pay taxes, save, and buy 10 private consumption goods.

The second institution, Government, levies taxes and Social Security contributions, then, it pays Transfers to Households, Collective Services, Public Health and Education, transfers to RoW, and saves what is left. Income Taxes come from Households and from the corporate sector (Capital). Indirect Taxes minus Subsidies, Other Taxes to Production, and Social Security contributions, are levied on Activities. The Value Added Tax is charged on Private Consumption goods. Social Transfers are paid by the Government as we said, and Other Transfers come from the Government and from the Rest of the World also.

The Savings account collects savings from Households, Government, Capital, and RoW, and then the Investment account buys investment goods from the Activities.

Labor has been disaggregated into 18 types, according to the classification provided by the ENIGH-96, based on the notion that the post occupied by a worker better reflects his qualification than his scholar degree. Labor obtains income from Activities and distributes it among the

[8] SCNM's information comes in three volumen: "Cuentas de Bienes y servicios 1988-00" (Goods and Services Accounting); "Cuentas por Sectores Institucionales, 1993-98" (Institutional Sectors Accounting); "Indicadores Macroeconómicos del Sector Público, 1988-99" (Public Sector Macroeconomic Indicators).

households. We assume capital moves freely from any sector in the economy to any other sector, therefore we have only one homogeneous Capital, which distributes its income among Households, Taxes, Savings, and the RoW.

As for the Activities, we define eighteen: seventeen from the National Accounts System, and another one to account for Government expenditures on public goods. Activities hire Labor and Capital, buy domestic and imported inputs, and pay Taxes including Social Security contributions, to produce the Total Supply. Total Supply is then sold to Investment, Intermediate Consumption, Private Consumption Goods, Public Goods, and Exports.

Labor and capital income (plus non-resident income) is distributed between institutions according to their property rights.

The Private Consumption Goods account is a transformation account which "buys" homogeneous goods and services from the Activities to combine them in order to "produce" 10 Private Consumption Goods. The VAT is charged to consumers and then it is transferred to the Government.

Finally, the RoW gets income from Imports and Transfers (corporate sector and Government), and pays for Transfers to Households, Savings (Current Account Deficit), Labor (Remittances), and Exports. Appendix 1 defines every entry of the matrix and Appendix 2 contains the SAM-MX96.

Table 1.1 **Main Blocks of the SAM-MX96**
**(pesos of 1996)**

| | H | G | IT | IT-S | OTP | VAT | SS | ST | OT | INVESTMENT |
|---|---|---|---|---|---|---|---|---|---|---|
| **Households (10)** | | | | | | | | 29,427,283 | 42,392,016 | |
| **Government** | | | 118,028,898 | 136,202,471 | 9,689,701 | 90,095,116 | 66,688,160 | | | |
| **Income Taxes** | 50,592,091 | | | | | | | | | |
| **Indirect Taxes – Subsidies** | | | | | | | | | | |
| **Other Taxes to Production** | | | | | | | | | | |
| **Value Added Tax** | | | | | | | | | | |
| **Social Security** | | | | | | | | | | |
| **Social Transfers** | | 29,427,283 | | | | | | | | |
| **Other Transfers** | | 7,968,896 | | | | | | | | |
| **Savings** | 192,880,673 | 103,212,438 | | | | | | | | |
| **Labor (18)** | | | | | | | | | | |
| **Capital** | | | | | | | | | | |
| **Activities (18)** | | | | | | | | | | 583,558,024 |
| **Private Consumption Goods (10)** | 1,642,422,657 | | | | | | | | | |
| **Colective Services** | | 110,761,607 | | | | | | | | |
| **Public Health** | | 41,867,183 | | | | | | | | |
| **Public Education** | | 91,077,046 | | | | | | | | |
| **RoW** | | 36,389,893 | | | | | | | | |
| **TOTAL** | **1,885,895,421** | **420,704,346** | **118,028,898** | **136,202,471** | **9,689,701** | **90,095,116** | **66,688,160** | **29,427,283** | **42,392,016** | **583,558,024** |

| | L | K | A | PCG | CS | PH | PE | RoW | TOTAL |
|---|---|---|---|---|---|---|---|---|---|
| **Households (10)** | 667,809,664 | 1,146,266,458 | | | | | | | **1,885,895,421** |
| **Government** | | | | | | | | | **420,704,346** |
| **Income Taxes** | | 67,436,807 | | | | | | | **118,028,898** |
| **Indirect Taxes – Subsidies** | | | 136,202,471 | | | | | | **226,297,587** |
| **Other Taxes to Production** | | | 9,689,701 | | | | | | **9,689,701** |
| **Value Added Tax** | | | | 90,095,116 | | | | | **90,095,116** |
| **Social Security** | | | 66,688,160 | | | | | | **66,688,160** |
| **Social Transfers** | | | | | | | | | **29,427,283** |
| **Other transfers** | | | | | | | | 34,423,120 | **42,392,016** |
| **Savings** | | 270,908,775 | | | | | | 16,556,138 | **583,558,024** |
| **Labor (18)** | | | 662,301,178 | | | | | 5,508,486 | **667,809,664** |
| **Capital** | | | 1,558,112,676 | | | | | | **1,558,112,676** |
| **Activities (18)** | | | 1,855,760,199 | 1,552,327,541 | 110,761,607 | 41,867,183 | 91,077,046 | 559,387,191 | **4,794,833,907** |
| **Private Consumption Goods (10)** | | | | | | | | | **1,642,422,657** |
| **Colective Services** | | | | | | | | | **110,761,607** |
| **Public Health** | | | | | | | | | **41,867,183** |
| **Public Education** | | | | | | | | | **91,077,046** |
| **RoW** | | 73,500,636 | 505,984,406 | | | | | | **615,874,935** |
| **TOTAL** | **667,809,664** | **1,558,112,676** | **4,794,833,907** | **1,642,422,657** | **110,761,607** | **41,867,183** | **91,077,046** | **615,874,935** | |

## II. The AGE model of the Mexican economy

The AGE model used in this study is a standard static model.[9] A short summary of the model features follows.

### *Agents*

The model includes 18 productive Activities, 10 Households (classified by income), and the Government. External sectors are aggregated into one RoW. Corporations, although distinguished from Households for accounting reasons, play no active role in the model.

### *Goods and factors*

There are 18 produced commodities that are used in production, satisfying private and public consumption and export demand. Produced commodities are combined in fixed proportions to obtain private consumption and investment goods. There are also 17 types of labor and a homogeneous capital good. The investment is a fixed proportions bundle of produced commodities.

### *Producers*

Production is a constant returns to scale nested technology. At the highest level, aggregate commodities are a CES Armington mix of domestic goods and imports. Domestic goods are produced in fixed proportions using Value Added and intermediate consumption. Finally, Valued Added is a Cobb-Douglas aggregate of 17 types of labor and capital.

Producers maximize profits subject to the technology constraint and determine factor demands and prices in the usual way. a) At the lowest level of the nest: primary factors demands and the price of value added are

[9] The model´s equations are in Appendix 3.

obtained. b) At the intermediate level: value added and intermediate commodity demands and domestic prices are computed. And C) at the highest level: domestic commodities and imports demands and aggregate commodity prices are calculated.

Three tax rates influence those decisions. A social security tax is levied on labor services hired by producers and an *ad valorem* tax burdens producers' purchases of domestic commodities and equivalent imports.

***Households***

Households' welfare is a two level nested function. Utility is a CES function of present and future consumption and present consumption is, in turn, a Cobb-Douglas aggregate of 10 private consumption commodities. As indicated above, private consumption goods are produced with aggregate commodities, and are subject to a sales tax calculated from the value added tax revenues.

Households maximize utility subject to a complex budget constraint. At the top level, present and future consumption expenditures must not exceed net of taxes disposable income. Consumers' gross income is derived from sales of labor and dividends paid out by corporations. Gross income is then adjusted by net Government transfers and personal income taxes to obtain net disposable consumers' income.

***Firms***

Although firms are owned by households, they are treated separately. Their gross income is the value of capital services sold to producers and their net disposable income is calculated taking out profit taxes and dividends paid out to households. Their net disposable income can be used to retain net earnings or to finance investment.

***Government***

Government is a producer, a consumer, and plays and active role in the process of income distribution. As any producer, the Government uses factors (aggregate commodities, labor and capital) to produce one public commodity (general services) and two services provided to households (health and education). The way the latter two are allocated among the 10 households is not known and their impact on households' utility is disregarded. Ignoring this issue does not affect the results, since Government policy supply is unchanged in the simulations. Additional transfers to households are paid with additional revenues.

As mentioned, Government current revenues come from social security, production, imports, value added and personal and corporation income taxes. Government current expenditures include the costs incurred to produce three publicly supplied services (collective, health, and education), social transfers[10], other current transfers[11], and transfers to the rest of the world (debt service). The government also saves and invests (in public infrastructures), so, the difference between total current revenues and total expenditures define government's deficit.

***Rest of the World***

The Rest of the World (RoW) demands capital, labor, and goods and services. Following Armington (1969), imports are imperfect substitutes of domestic commodities and producers choose the optimal mix to maximize profits. Exports are exogenously fixed and, therefore, the external deficit is endogenous. A positive difference between all revenues (value of imports plus labor and capital payments and transfers to other countries) and expenditures (value of exports plus labor and capital revenues and transfers from other countries) determine the external savings used to finance domestic investment.

***Market clearing***

Commodity markets always clear. For each commodity, the sum of intermediate consumption by producers, commodity demand used to produce private and public consumption commodities, investment demand and exports equal total supply provided by domestic producers and the external sectors (imports). Capital services demanded by producers also equal total households' endowments. Labor markets may or may not clear. In the latter case, the real wage is assumed to be a function of the unemployment rate, so that:

$$\frac{w}{CPI} = k_0 \left(1-u\right)^{\frac{1}{\beta}}$$

where $w$ is the wage rate, CPI a consumer's price index, $u$ the unemployment rate, $k_0$ a calibration constant, and the elasticity $\beta$ an exogenous parameter. (See Kehoe and Serra-Puche [1983a], and Polo and Sancho [1993]).

[10] Known as "Prestaciones", these transfers may vary from employer to employer, usually they refer to the following: 1) One month of extra salary every December (Aguinaldo), 2) Holidays specified by the Federal Labor Law, 3) Employer contributions for a federal fund to support loans to buy or build a house (Infonavit), and 4) Profits sharing.

[11] Generally, direct transfers to the poor through food coupons.

### *Macroeconomic closures*

Investment is a composite good produced in fixed proportions determined by the commodity composition of investment in the base year. The value of investment equals the value of private savings plus public savings, plus (minus) the current account.

Because our model is static, when we simulate a reform to evaluate its effects on welfare, allowing investment variations, we could observe, at the same time, an increase in welfare and a decrease in investment, not knowing how much of the increase in welfare comes from the reform itself, and how much from investment's decrease. Therefore, to isolate the reform's effect, we carry out simulations keeping constant the level of investment at the initial level, by compensating variations in private savings with variations -in the opposite direction- in public savings. Under the same argument, we fix the external deficit at the initial level, allowing exports' variations to compensate for any variation in imports. (See Lofgren, Harris, and Robinson [2002], pp. 14-17).

### *Equilibrium*

In the clearing version of the model, an equilibrium is a price vector, production and consumption plans, a government surplus and a surplus for the external sector, such that those plans maximize consumers utility subject to their budget constraint, maximize producers profits, the government surplus equals the difference between government revenues and expenditures, the external sector surplus equal the difference between revenues and expenditures and all markets clear. In the non-clearing version, a vector of unemployment rates is endogenously determined and households' income depends on the unemployment rate.

### *Welfare variations*

Welfare changes generated by reforms are evaluated with Hicks' Equivalent Variation (EV), defined as the income transfer required by a household to achieve the new utility level at the initial prices, that is, the amount of money necessary for the household to arrive to the utility level that the reform would generate.

## III. Fiscal scenarios and results

According to the SAM-MX96, and as the second column of Table 3.5 shows, 34.7% of Government's total current revenue comes from Production taxes, the VAT contributes with 21.4%, Social Security contributions with 15.9%, Corporation taxes with 16%, and (Personal) Income taxes with 12%. As for the expenditures, 7% of government's current revenues is devoted to Social Transfers, 1.9% to Other Transfers, 24.5% to investment, 26.3% to Collective Services (which include bureaucracy payroll and Government expenses), 10% to public health, 21.6% to public education, and 8.7% to the rest of the world (debt service).

Table 3.1 presents 1996 VAT rates (column VAT0) on the 10 private consumption commodities and ISR rates (column ISR0) on the 10 households included in the model. The VAT0 rates are effective tax rates estimated using the VAT revenue figures in the SAM-MX96 and the technology used to produce consumption goods. The results lead to classify commodities in three groups.

Table 3.1 **1996 benchmark and simulated tax rates**

| | VAT rates on commodities (%) | | | | ISR rates on households (%) | | |
|---|---|---|---|---|---|---|---|
| | **VAT0** | **S1** | **S3** | | **ISR0** | **S2** | **S4** |
| | | **VAT0 × 1.187** | **Uniform VAT** | | | **ISR0 × 1.447** | **Uniform ISR** |
| **C1** | 0.67 | 0.79 | 7.06 | **H1** | 0.20 | 0.29 | 3.79 |
| **C2** | 10.18 | 12.08 | 7.06 | **H2** | 0.65 | 0.94 | 3.79 |
| **C3** | 5.66 | 6.71 | 7.06 | **H3** | 1.05 | 1.52 | 3.79 |
| **C4** | 10.18 | 12.08 | 7.06 | **H4** | 1.20 | 1.74 | 3.79 |
| **C5** | 0.00 | 0.00 | 7.06 | **H5** | 1.31 | 1.89 | 3.79 |
| **C6** | 5.52 | 6.55 | 7.06 | **H6** | 1.33 | 1.92 | 3.79 |
| **C7** | 6.76 | 8.02 | 7.06 | **H7** | 1.36 | 1.96 | 3.79 |
| **C8** | 2.79 | 3.31 | 7.06 | **H8** | 1.69 | 2.44 | 3.79 |
| **C9** | 10.18 | 12.08 | 7.06 | **H9** | 2.01 | 2.91 | 3.79 |
| **C10** | 9.50 | 11.27 | 7.06 | **H10** | 4.76 | 6.89 | 3.79 |

Notes: 1. VAT0 and ISR0 are the benchmark vectors of VAT and ISR rates, respectively. 2. 1.187 is the scaling factor applied to benchmark VAT rates and 1.447 the scaling factor applied to benchmark ISR rates.

The more heavily taxed includes Clothes and Shoes (C2), Furniture, and domestic equipment and gadgets supplies (C4), Hotels, coffee shops and restaurants (C9), and Other goods and services (C10) with VAT rates in the neighborhood of 10%. The intermediate group includes Entertainment and culture (C7), Housing, electricity, gas, water (C3) and Transportation (C6) with VAT rates near 6%. The last subset includes low taxed commodities such as Education (C8) and Food and beverages and tobacco (C1) and Health (C5) with a zero rate.

Low (high) income families are more likely to spent their income in commodities with low (high) VAT rates. Therefore, one can expect that setting a unique VAT rate will especially hit (favor) those households having large expenditure shares in the relatively low (high) tax commodities. Table 3.2 shows the commodity shares of the 10 consumption goods in households' present consumption.

Effective ISR rates in the benchmark are pretty low. Notice that effective rates for all households, except for the richest decile, are below 2% and that, the rate structure, although progressive, is pretty flat in the middle income deciles (H3-H7). It is likely -as in VAT case- that setting a uniform ISR rate will hit (favor) low (high) income households.

Table 3.1 also shows the endogenously determined tax structure in each of the four policy scenarios simulated.[12] In all cases tax rates are set to achieve a 20 unit increase in Hicks' EV of the poorest household by transferring to it the extra government revenue obtained from the reform.[13] In column S1 (S4) it appears the new VAT (ISR) rates are scaled up by 1.187 (1.447), while in column S2 (S4) all VAT (ISR) rates are set equal to 7.06% (3.79%). Just as a reference, flat levels for the VAT and ISR that maintain the benchmark public surplus are 5.94% and 2.57% respectively.

With respect to changes in total supply, as expected since simulated reforms are relatively small, and as table 3.3 shows, no changes greater than 3% are observed. Also, given that VAT rates for the agricultural and food sectors are initially equal to zero, when we simulate a uniform tax, which implies a 7.06% increase for said sectors, we would expect that the greatest diminutions in total supply would occur there, as it actually happens.

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[12] The simulations reported assume all labor markets clear. These results are not significantly altered when the real wage is assumed to depend on the unemployment rate and the latter is endogenously determined. Rescaling VAT rates is once more the most appropriate policy in terms of global EV although the unemployment rate increases slightly.

[13] The 20 unit increase has been chosen because it takes the poorest households' utility level roughly just under that of the second decile's, which are just under the extreme poverty line.

Table 3.2. **Percentage Consumption Goods shares in Households' Present Consumption**

| Commodity | VAT0 | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **C1** | 0.67 | 40.4 | 34.4 | 33.4 | 30.9 | 29.2 | 25.7 | 24.2 | 21.7 | 17.5 | 11.3 |
| **C2** | 10.18 | 1.6 | 1.5 | 1.6 | 1.5 | 1.7 | 1.6 | 1.6 | 1.7 | 1.8 | 1.6 |
| **C3** | 5.66 | 18.6 | 19.8 | 19.1 | 18.9 | 18.7 | 17.6 | 16.8 | 17.8 | 14.5 | 14.8 |
| **C4** | 10.18 | 6.3 | 5.6 | 5.5 | 4.9 | 4.9 | 4.5 | 4.4 | 4.6 | 4.5 | 5.2 |
| **C5** | 0.00 | 3.5 | 3.6 | 4.6 | 4.3 | 3.2 | 2.4 | 2.7 | 3.0 | 3.4 | 3.2 |
| **C6** | 5.52 | 8.6 | 8.4 | 9.4 | 9.9 | 10.8 | 12.1 | 11.8 | 12.3 | 12.3 | 15.7 |
| **C7** | 6.76 | 0.9 | 1.1 | 1.1 | 1.2 | 1.5 | 1.8 | 1.7 | 2.3 | 3.4 | 4.8 |
| **C8** | 2.79 | 3.3 | 3.8 | 4.5 | 4.7 | 5.0 | 5.1 | 6.0 | 6.0 | 6.7 | 8.1 |
| **C9** | 10.18 | 9.8 | 14.8 | 14.1 | 16.3 | 16.1 | 21.6 | 23.2 | 21.8 | 26.8 | 25.1 |
| **C10** | 9.50 | 6.9 | 7.1 | 6.8 | 7.2 | 8.9 | 7.7 | 7.8 | 8.7 | 9.3 | 10.2 |
| **Total** | | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** | **100** |

The first four columns of table 3.4 present Hicks' EV for the 10 income deciles. In all scenarios, the policy reform achieves the same increase for poorest income decile and all the other households register a welfare lost with just one exception: the richest decile increases its welfare when the additional revenues used to finance the transfer are obtained setting a uniform income rate (3.79%) lower than the tax rate paid by the richest decile (4.79%) in 1996. The overall increase in welfare obtained by adding up the impact on all households' deciles is reported in the last row (Total) of the table. It is positive for the two VAT reforms (S1 and S3), negative when ISR rates are scaled up (S2) and slightly positive when a single income rate is set (S4).

**Table 3.3** Total supply: Benchmark values and percentage variation

| Activities | Benchmark | S1<br>IVA0×1.187 | S2<br>ISR0×1.447 | S3<br>7.06% VAT | S4<br>3.79% ISR |
|---|---|---|---|---|---|
| **A1** | 245.594 | 1.487 | 0.994 | -2.622 | 0.465 |
| **A2** | 80.925 | 0.080 | 0.079 | -0.166 | 0.058 |
| **AI** | 423.766 | 1.656 | 1.101 | -2.917 | 0.512 |
| **AII** | 131.502 | -0.187 | 0.002 | 1.010 | 0.009 |
| **AIII** | 39.538 | -0.030 | 0.081 | 0.647 | 0.094 |
| **AIV** | 74.613 | -0.058 | -0.121 | -0.340 | -0.024 |
| **AV** | 305.131 | 0.018 | 0.018 | 0.000 | 0.051 |
| **AVI** | 72.658 | 0.006 | 0.118 | 0.702 | 0.114 |
| **AVII** | 120.819 | 0.040 | 0.039 | -0.180 | 0.036 |
| **AVIII** | 815.858 | 0.004 | 0.004 | -0.153 | 0.030 |
| **AIX** | 78.556 | 0.010 | -0.013 | -0.209 | 0.013 |
| **A4** | 224.752 | 0.000 | 0.001 | 0.000 | 0.000 |
| **A5** | 47.549 | 0.067 | 0.086 | 0.053 | 0.029 |
| **A6** | 659.246 | -0.630 | -0.335 | 1.520 | -0.229 |
| **A7** | 373.467 | -0.266 | -0.243 | 0.189 | -0.057 |
| **A8** | 434.424 | 0.042 | 0.086 | 0.213 | 0.002 |
| **A9** | 555.579 | -0.114 | -0.208 | -0.405 | -0.044 |
| **A10** | 110.762 | 0.000 | 0.000 | 0.000 | 0.000 |

**Table 3.4** Benchmark utility and households' EV

| | | Equivalent Variation | | | | Percentage change with respect to initial utility | | | |
|---|---|---|---|---|---|---|---|---|---|
| House-Hold | Bench-mark Utility | S1<br>IVA0×1.187 | S2<br>ISR0×1.447 | S3<br>7.06% VAT | S4<br>3.79% ISR | S1<br>IVA0×1.187 | S2<br>ISR0×1.447 | S3<br>7.06% VAT | S4<br>3.79% ISR |
| **H1** | 30.719 | 20.000 | 20.000 | 20.000 | 20.000 | 65.11 | 65.11 | 65.11 | 65.11 |
| **H2** | 56.167 | -0.401 | -0,157 | -1.101 | -1.768 | -0.72 | -0.28 | -1.96 | -3.15 |
| **H3** | 71.212 | -0.516 | -0.330 | -1.461 | -1.966 | -0.72 | -0.46 | -2.05 | -2.76 |
| **H4** | 91.961 | -0.715 | -0.494 | -1.692 | -2.405 | -0.78 | -0.54 | -1.84 | -2.61 |
| **H5** | 109.484 | -0.903 | -0.652 | -1.787 | -2.752 | -0.82 | -0.60 | -1.63 | -2.51 |
| **H6** | 138.870 | -1.224 | -0.838 | -1.777 | -3.457 | -0.88 | -0.60 | -1.28 | -2.49 |
| **H7** | 174.595 | -1.501 | -1.084 | -1.944 | -4.301 | -0.86 | -0.62 | -1.11 | -2.46 |
| **H8** | 208.020 | -1.893 | -1.634 | -2.208 | -4.456 | -0.91 | -0.79 | -1.06 | -2.14 |
| **H9** | 295.494 | -2.845 | -2.783 | -2.058 | -5.365 | -0.96 | -0.94 | -0.70 | -1.82 |
| **H10** | 658.781 | -5.894 | -14.834 | -2.717 | 6.705 | -0.89 | -2.25 | -0.41 | 1.02 |
| **Total** | | **4.108** | **-2.806** | **3.255** | **0.235** | | | | |

The percentage utility changes for the 10 households' deciles appear in the last four columns. Scaling up all VAT rates (S1) reduces the utility of all other deciles by almost the same percentage (0.7-1.0 per cent), while the impact of scaling up the ISR rates increases with income and reaches 2.25% for the richest decile. The impact of setting a uniform VAT or ISR rates (scenarios S3 and S4, respectively) are clearly regressive, especially the latter one that reduces the second poorest income decile by 3.2% and increases the utility of the richest decile by almost 1%.

Comparison of S3 (uniform VAT) and S4 (uniform ISR) shows that both, VAT and ISR's are progressive, but ISR is more progressive, given that the highest income decile is highly benefited, in both cases medium-high income deciles bear the greatest part of the reform's cost. Considering the four reforms analyzed, and from a global efficiency viewpoint, results suggest that the best policy, among the alternatives considered, would be an increase in IVA maintaining its structure, because this would give the greater global benefit in terms of the EV.

Table 3.5 shows the effects of each reform on fiscal revenues. Production tax revenues and Social security contributions changes are modest, always under 1% of their benchmark values. Therefore, the change in Government revenues that appears in the last row is determined by the change in VAT revenues (S1 y S3) or ISR revenues (S2 and S4). The results indicate that the surplus transferred to the poorest household when VAT rates are scaled up by 1.187 (column S1) 16.495 is less than 18.355, the amount transferred when a single 7.06% VAT rate is set.

This is so because a uniform VAT rate increases the price of commodities bought by the poorest household and the amount transferred has to be larger. If the extra revenue is obtained scaling up ISR tax rates (column S2), the budget surplus required to achieve the same welfare increase of the poorest household, 22.459, is much larger than in the two previous scenarios and greater than 20.793 the transfer required when there is a flat income tax rate (Column S4, 20.793).

**Table 3.5** Government tax revenues

| | | Million pesos | | | | Percentage change | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **1996** | **S1** IVA0 × 1.187 | **S2** ISR0 × 1.447 | **S3** 7.06% VAT | **S4** 3.79% ISR | **S1** IVA0 × 1.187 | **S2** ISR0 × 1.447 | **S3** 7.06% VAT | **S4** 3.79% ISR |
| **Production** | 145.892 | 146.423 | 146.240 | 144.828 | 146.084 | 0.364 | 0.239 | -0.729 | 0.132 |
| **VAT** | 90.095 | 106.156 | 89.736 | 109.504 | 89.923 | 17.827 | -0.398 | 21.543 | -0.191 |
| **Social security** | 66.688 | 66.602 | 66.597 | 66.680 | 66.662 | -0.129 | -0.136 | -0.012 | -0.039 |
| **Corporation** | 67.437 | 67.437 | 67.437 | 67.437 | 67.437 | 0.000 | 0.000 | 0.000 | 0.000 |
| **Income Tax** | 50.592 | 50.581 | 73.154 | 50.610 | 71.393 | -0.022 | 44.596 | 0.036 | 41.115 |
| **TOTAL** | 420.704 | 437.199 | 443.163 | 439.059 | 441.497 | 3.921 | 5.338 | 4.363 | 4.942 |
| **Δ TOTAL** | | 16.495 | 22.459 | 18.355 | 20.793 | | | | |

Notes: see Table 3.1.

Finally, a note on drawbacks and shortcomings of our model is in place. All the caveats for AGE models apply to our model. The well known advice about taking this kind of results with caution should be kept in mind when drawing possible policy implications, since such results constitute a guide-

more than an exact quantitative analysis- to what could possibly happen if a reform is implemented.

On the other hand, our model has been designed on the base of a 1996 SAM. First, the fact that this type of AGE analysis is based on a single point observation constitutes one of the most frequent criticisms against it. Since it is not our purpose to tackle methodological issues here, we argue that 1996 is a typical year in the Mexican economy so that, our results are valid to the extent that said type of static AGE analysis is valid. Second, 1996 is an eleven years old year, and results might, or might not, apply to actual circumstances, depending on how much the structure of the economy has changed. No doubt, actualization of data bases[14] is necessary to further study these issues, and to confirm or correct several results.

Another frequent criticism goes about the use of exogenous (non-SAM calibrated) parameters, such as the substitution elasticity, since results might be very sensitive to elasticity specification. In our case, we use Armington elasticities to account for the degree of substitution between imports and domestic goods, and similar elasticities to account for the degree of substitution between present and future consumption. To asses if these elasticities are driving the results in certain direction, sensitivity analysis are performed. According to the series of simulations we performed using alternative sets of elasticities, the qualitative results are robust, and quantitative results do not experiment significant changes.

## VI. Final comments

An AGE model is used to analyze the efficiency degree of four alternative reforms that generate funds devoted to alleviate extreme poverty. The results suggest that, from a global Equivalent Variation (EV) viewpoint, (comparable in the sense that each reform generates the same EV for the lowest income decile), financing the policy of direct transfers through an increase in the VAT (keeping its structure) is more efficient than financing through an increase in ISR (keeping its structure).

Our results about the efficiency of direct transfers are underestimated because our model does not take into account potential gains, such as the

[14] In the first quarter of 2008, INEGI published an Input-Output Table (IOT) of the Mexican economy for the year 2003. The previous IOT available from INEGI was one for the year 1985, which resulted from a series of actualizations of a 1978 IOT. As far as we know, there are no clues on whether the INEGI will set a periodicity for this work, or we are going to wait again about 30 years –or any random amount of years-, to see another survey-based IOT for Mexico.

increase in human capital derived from, for example, conditioned direct transfers to school and public health institutions attendance, like PROGRESA/OPORTUNIDADES.

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## **Appendix 1.** SAM-MX96 accounts

| | | |
|---|---|---|
| H1 | 1 | First decile of households |
| H2 | 2 | Second decile of households |
| H3 | 3 | Third decile of households |
| H4 | 4 | Fourth decile of households |
| H5 | 5 | Fifth decile of households |
| H6 | 6 | Sixth decile of households |
| H7 | 7 | Seventh decile of households |
| H8 | 8 | Eight decile of households |
| H9 | 9 | Ninth decile of households |
| H10 | 10 | Tenth decile of households |
| L1 | 11 | PROFFESIONALS |
| L2 | 12 | TECHNICIANS |
| L3 | 13 | EDUCACION WORKERS |
| L4 | 14 | ART, SHOWS, AND SPORTS WORKERS |
| L5 | 15 | FUNCTIONARIES AND MANAGERS OF THE PUBLIC, PRIVATE, AND SOCIAL SECTORS |
| L6 | 16 | WORKERS IN AGRICULTURAL, LIVESTOCK, FORESTRY, AND HUNTING AND FISHING ACTIVITIES |
| L7 | 17 | SUPERVISORS AND OTHER CONTROL WORKERS |
| L8 | 18 | ARTISANS AND WORKERS IN THE TRANSFORMATION INDUSTRY |
| L9 | 19 | MACHINE OPERATORS IN INDUSTRIAL PRODUCTION |
| L10 | 20 | ASSISTANTS, PEONS AND SIMILARS IN THE TRANSFORMATION INDUSTRY |
| L11 | 21 | DRIVERS AND ASSISTANTS |
| L12 | 22 | COORDINATORS AND SUPERVISORS IN ADMINISTRATIVE AND SERVICES ACTIVITIES |
| L13 | 23 | ASSISTANTS IN ADMINISTRATIVE ACTIVITIES |
| L14 | 24 | MERCHANTS, COMMERCE EMPLOYEES AND SALES AGENTS |
| L15 | 25 | WALKING MERCHANTS AND WALKING WORKERS |
| L16 | 26 | EMPLOYEES IN ESTABLISHMENTS FOR PERSONAL SERVICES |
| L17 | 27 | WORKERS IN DOMESTIC SERVICES |
| L18 | 28 | WORKERS IN PROTECTION SERVICES AND THE ARMY |
| K | 29 | Capital |
| A1 | 30 | Agriculture, livestock, forestry, hunting and fishing |
| A2 | 31 | Mining |
| AI | 32 | Food, beverages and tobacco |
| AII | 33 | Textiles, clothes, and leather industries |
| AIII | 34 | Wood Industry and Wood products |
| AIV | 35 | Paper, paper products, printing-houses and publishers |
| AV | 36 | Chemicals, oil derivatives, rubber and plastic |
| AVI | 37 | Non metallic mining products |
| AVII | 38 | Basic metallic industries |
| AVIII | 39 | Metallic products, machinery and equipment |
| AIX | 40 | Other manufacturing |
| A4 | 41 | Construction |
| A5 | 42 | Electricity |
| A6 | 43 | Commerce, restaurants and hotels |
| A7 | 44 | Transportation, storage and communications |
| A8 | 45 | Financing services, insurance and real estate |
| A9 | 46 | Communal, social, and personal services |
| A10 | 47 | Collective services |
| C1 | 48 | Food, beverages and tobacco |
| C2 | 49 | Clothes and shoes |
| C3 | 50 | Housing, electricity, gas, and water |
| C4 | 51 | Furniture, and domestic equipment and gadgets |
| C5 | 52 | Health |
| C6 | 53 | Transportation |
| C7 | 54 | Entertainment and culture |
| C8 | 55 | Education |
| C9 | 56 | Hotels, coffee shops, and restaurants |
| C10 | 57 | Diverse goods and services |
| AAPP | 58 | Government |
| IIRE | 59 | Income tax |
| IIMS | 60 | Indirect taxes minus subsidies |
| IP | 61 | Other taxes to production |
| IVA | 62 | Value added tax |
| CS | 63 | Social Contributions |
| PS | 64 | Social transfers |
| OT | 65 | Other transfers |
| AHBR | 66 | Savings-Investment |
| CSC | 67 | Collective services consumption |
| CSP | 68 | Public health consumption |
| CEP | 69 | Public education consumption |
| PGRDM | 70 | PAYMENTS TO THE REST OF THE WORLD |
| TLCAN | 71 | EXTERNAL SECTOR NAFTA AREA |
| RDP | 72 | EXTERNAL SECTOR REST OF COUNTRIES |

**Appendix 2.** The Social Accounting Matrix of Mexico for 1996 (SAM-MX96)

| **MCS-MX96** | H1 | H2 | H3 | H4 | H5 | H6 | H7 | H8 | H9 | H10 |
|---|---|---|---|---|---|---|---|---|---|---|
| H1 | | | | | | | | | | |
| H2 | | | | | | | | | | |
| H3 | | | | | | | | | | |
| H4 | | | | | | | | | | |
| H5 | | | | | | | | | | |
| H6 | | | | | | | | | | |
| H7 | | | | | | | | | | |
| H8 | | | | | | | | | | |
| H9 | | | | | | | | | | |
| H10 | | | | | | | | | | |
| SOC | | | | | | | | | | |
| AAPP | | | | | | | | | | |
| IIRE | 62,301 | 369,442 | 755,722 | 1,116,543 | 1,448,972 | 1,870,024 | 2,403,559 | 3,566,393 | 6,070,281 | 32,928,853 |
| IIMS | | | | | | | | | | |
| IP | | | | | | | | | | |
| IVA | | | | | | | | | | |
| CS | | | | | | | | | | |
| PS | | | | | | | | | | |
| OT | | | | | | | | | | |
| AHBR | 767,482 | 1,564,081 | 1,694,621 | 2,707,137 | 3,640,015 | 6,055,036 | 16,213,246 | 13,399,683 | 23,574,576 | 123,264,795 |
| L1 | | | | | | | | | | |
| L2 | | | | | | | | | | |
| L3 | | | | | | | | | | |
| L4 | | | | | | | | | | |
| L5 | | | | | | | | | | |
| L6 | | | | | | | | | | |
| L7 | | | | | | | | | | |
| L8 | | | | | | | | | | |
| L9 | | | | | | | | | | |
| L10 | | | | | | | | | | |
| L11 | | | | | | | | | | |
| L12 | | | | | | | | | | |
| L13 | | | | | | | | | | |
| L14 | | | | | | | | | | |
| L15 | | | | | | | | | | |
| L16 | | | | | | | | | | |
| L17 | | | | | | | | | | |
| L18 | | | | | | | | | | |
| K | | | | | | | | | | |
| A1 | | | | | | | | | | |
| A2 | | | | | | | | | | |
| AI | | | | | | | | | | |
| AII | | | | | | | | | | |
| AIII | | | | | | | | | | |
| AIV | | | | | | | | | | |
| AV | | | | | | | | | | |
| AVI | | | | | | | | | | |
| AVII | | | | | | | | | | |
| AVIII | | | | | | | | | | |
| AIX | | | | | | | | | | |
| A4 | | | | | | | | | | |
| A5 | | | | | | | | | | |
| A6 | | | | | | | | | | |
| A7 | | | | | | | | | | |
| A8 | | | | | | | | | | |
| A9 | | | | | | | | | | |
| A10 | | | | | | | | | | |
| C1 | 12,107,260 | 18,780,689 | 23,188,034 | 27,616,083 | 30,897,017 | 34,124,197 | 38,331,414 | 42,321,591 | 47,556,544 | 60,733,519 |
| C2 | 480,164 | 826,012 | 1,082,715 | 1,328,353 | 1,817,497 | 2,080,319 | 2,524,416 | 3,370,990 | 4,863,824 | 8,510,742 |
| C3 | 5,579,497 | 10,787,797 | 13,269,005 | 16,910,772 | 19,748,615 | 23,412,552 | 26,618,604 | 34,609,192 | 39,439,125 | 79,092,344 |
| C4 | 1,898,874 | 3,080,109 | 3,842,437 | 4,382,639 | 5,145,300 | 5,945,433 | 6,916,008 | 8,984,679 | 12,325,038 | 27,958,078 |
| C5 | 1,039,796 | 1,973,305 | 3,225,893 | 3,866,521 | 3,402,654 | 3,180,691 | 4,213,311 | 5,886,716 | 9,160,240 | 17,109,105 |
| C6 | 2,579,590 | 4,563,495 | 6,501,235 | 8,864,457 | 11,418,377 | 16,080,042 | 18,624,816 | 23,879,038 | 33,323,238 | 83,842,519 |
| C7 | 278,639 | 603,038 | 738,987 | 1,053,695 | 1,561,154 | 2,330,093 | 2,691,314 | 4,550,638 | 9,112,014 | 25,970,364 |
| C8 | 975,976 | 2,063,555 | 3,118,925 | 4,181,724 | 5,307,774 | 6,796,443 | 9,469,648 | 11,644,024 | 18,095,199 | 43,298,289 |
| C9 | 2,931,145 | 8,064,730 | 9,788,541 | 14,579,357 | 17,088,797 | 28,700,200 | 36,694,921 | 42,434,374 | 72,821,577 | 134,345,659 |
| C10 | 2,080,897 | 3,859,987 | 4,761,726 | 6,470,356 | 9,457,061 | 10,165,105 | 12,297,211 | 16,938,722 | 25,222,714 | 54,655,567 |
| CSC | | | | | | | | | | |
| CSP | | | | | | | | | | |
| CEP | | | | | | | | | | |
| PGRDM | | | | | | | | | | |
| TLCAN | | | | | | | | | | |
| RDP | | | | | | | | | | |
| **TOTAL** | **30,781,621** | **56,536,239** | **71,967,842** | **93,077,637** | **110,933,233** | **140,740,134** | **176,998,468** | **211,586,039** | **301,564,371** | **691,709,834** |

| *MCS-MX96* | SOC | AAPP | IIRE | IIMS | IP | IVA | CS | PS | OT | AHBR |
|---|---|---|---|---|---|---|---|---|---|---|
| H1 | 25,093,060 | | | | | | | 922,230 | 1,328,536 | |
| H2 | 41,687,294 | | | | | | | 1,831,498 | 2,638,398 | |
| H3 | 49,455,561 | | | | | | | 1,928,965 | 2,778,806 | |
| H4 | 62,577,112 | | | | | | | 1,969,165 | 2,836,717 | |
| H5 | 71,151,615 | | | | | | | 2,162,519 | 3,115,256 | |
| H6 | 90,882,071 | | | | | | | 2,319,600 | 3,341,543 | |
| H7 | 114,608,590 | | | | | | | 2,648,448 | 3,815,270 | |
| H8 | 126,014,336 | | | | | | | 3,618,229 | 5,212,307 | |
| H9 | 178,260,188 | | | | | | | 4,783,988 | 6,891,663 | |
| H10 | 386,536,629 | | | | | | | 7,242,642 | 10,433,521 | |
| SOC | | | | | | | | | | |
| AAPP | | | 118,028,898 | 136,202,471 | 9,689,701 | 90,095,116 | 66,688,160 | | | |
| IIRE | 67,436,807 | | | | | | | | | |
| IIMS | | | | | | | | | | |
| IP | | | | | | | | | | |
| IVA | | | | | | | | | | |
| CS | | | | | | | | | | |
| PS | | 29,427,283 | | | | | | | | |
| OT | | 7,968,896 | | | | | | | | |
| AHBR | 270,908,775 | 103,212,438 | | | | | | | | |
| L1 | | | | | | | | | | |
| L2 | | | | | | | | | | |
| L3 | | | | | | | | | | |
| L4 | | | | | | | | | | |
| L5 | | | | | | | | | | |
| L6 | | | | | | | | | | |
| L7 | | | | | | | | | | |
| L8 | | | | | | | | | | |
| L9 | | | | | | | | | | |
| L10 | | | | | | | | | | |
| L11 | | | | | | | | | | |
| L12 | | | | | | | | | | |
| L13 | | | | | | | | | | |
| L14 | | | | | | | | | | |
| L15 | | | | | | | | | | |
| L16 | | | | | | | | | | |
| L17 | | | | | | | | | | |
| L18 | | | | | | | | | | |
| K | | | | | | | | | | |
| A1 | | | | | | | | | | 2,293,275 |
| A2 | | | | | | | | | | 63,419 |
| AI | | | | | | | | | | 33,635,954 |
| AII | | | | | | | | | | 16,109,035 |
| AIII | | | | | | | | | | 7,289,219 |
| AIV | | | | | | | | | | 3,811,919 |
| AV | | | | | | | | | | 15,634,813 |
| AVI | | | | | | | | | | 4,134,913 |
| AVII | | | | | | | | | | 5,014,511 |
| AVIII | | | | | | | | | | 183,313,021 |
| AIX | | | | | | | | | | 24,588,220 |
| A4 | | | | | | | | | | 224,256,523 |
| A5 | | | | | | | | | | 0 |
| A6 | | | | | | | | | | 50,623,302 |
| A7 | | | | | | | | | | 12,293,154 |
| A8 | | | | | | | | | | 0 |
| A9 | | | | | | | | | | 496,746 |
| A10 | | | | | | | | | | |
| C1 | | | | | | | | | | |
| C2 | | | | | | | | | | |
| C3 | | | | | | | | | | |
| C4 | | | | | | | | | | |
| C5 | | | | | | | | | | |
| C6 | | | | | | | | | | |
| C7 | | | | | | | | | | |
| C8 | | | | | | | | | | |
| C9 | | | | | | | | | | |
| C10 | | | | | | | | | | |
| CSC | | 110,761,607 | | | | | | | | |
| CSP | | 41,867,183 | | | | | | | | |
| CEP | | 91,077,046 | | | | | | | | |
| PGRDM | 73,500,636 | 36,389,893 | | | | | | | | |
| TLCAN | | | | | | | | | | |
| RDP | | | | | | | | | | |
| **TOTAL** | **1,558,112,675** | **420,704,346** | **118,028,898** | **136,202,471** | **9,689,701** | **90,095,116** | **66,688,160** | **29,427,283** | **42,392,016** | **583,558,024** |

| *MCS-MX96* | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 |
|---|---|---|---|---|---|---|---|---|---|---|
| H1 | 13,712 | 69,685 | 64,129 | 19,229 | 1,493 | 423,520 | 1,669 | 564,964 | 150,574 | 414,895 |
| H2 | 42,453 | 133,006 | 66,313 | 106,652 | 22,925 | 1,147,328 | 29,531 | 1,794,492 | 418,700 | 1,453,323 |
| H3 | 96,879 | 415,238 | 186,766 | 134,122 | 80,751 | 1,624,233 | 70,079 | 3,051,720 | 784,634 | 2,691,528 |
| H4 | 42,743 | 409,596 | 330,573 | 127,452 | 23,447 | 1,680,487 | 187,481 | 4,579,267 | 1,753,367 | 3,577,599 |
| H5 | 158,665 | 849,008 | 376,049 | 162,879 | 131,942 | 1,321,073 | 219,214 | 6,075,049 | 2,666,436 | 4,706,844 |
| H6 | 232,216 | 1,904,982 | 1,292,409 | 391,272 | 114,151 | 1,282,468 | 964,170 | 9,197,266 | 3,638,517 | 4,834,327 |
| H7 | 921,080 | 3,352,944 | 1,156,645 | 419,330 | 322,249 | 1,395,505 | 1,747,649 | 10,251,653 | 3,370,008 | 3,253,568 |
| H8 | 2,554,551 | 5,759,175 | 5,914,814 | 1,104,431 | 1,628,886 | 1,080,579 | 2,290,156 | 10,963,632 | 3,008,165 | 3,071,463 |
| H9 | 8,158,772 | 8,858,073 | 17,301,754 | 1,841,799 | 5,025,067 | 1,316,729 | 4,591,324 | 11,055,424 | 2,182,056 | 1,859,991 |
| H10 | 39,416,075 | 12,569,813 | 23,253,747 | 4,437,479 | 65,587,795 | 6,416,970 | 12,685,343 | 14,096,908 | 3,113,056 | 1,379,018 |
| SOC | | | | | | | | | | |
| AAPP | | | | | | | | | | |
| IIRE | | | | | | | | | | |
| IIMS | | | | | | | | | | |
| IP | | | | | | | | | | |
| IVA | | | | | | | | | | |
| CS | | | | | | | | | | |
| PS | | | | | | | | | | |
| OT | | | | | | | | | | |
| AHBR | | | | | | | | | | |
| L1 | | | | | | | | | | |
| L2 | | | | | | | | | | |
| L3 | | | | | | | | | | |
| L4 | | | | | | | | | | |
| L5 | | | | | | | | | | |
| L6 | | | | | | | | | | |
| L7 | | | | | | | | | | |
| L8 | | | | | | | | | | |
| L9 | | | | | | | | | | |
| L10 | | | | | | | | | | |
| L11 | | | | | | | | | | |
| L12 | | | | | | | | | | |
| L13 | | | | | | | | | | |
| L14 | | | | | | | | | | |
| L15 | | | | | | | | | | |
| L16 | | | | | | | | | | |
| L17 | | | | | | | | | | |
| L18 | | | | | | | | | | |
| K | | | | | | | | | | |
| A1 | | | | | | | | | | |
| A2 | | | | | | | | | | |
| AI | | | | | | | | | | |
| AII | | | | | | | | | | |
| AIII | | | | | | | | | | |
| AIV | | | | | | | | | | |
| AV | | | | | | | | | | |
| AVI | | | | | | | | | | |
| AVII | | | | | | | | | | |
| AVIII | | | | | | | | | | |
| AIX | | | | | | | | | | |
| A4 | | | | | | | | | | |
| A5 | | | | | | | | | | |
| A6 | | | | | | | | | | |
| A7 | | | | | | | | | | |
| A8 | | | | | | | | | | |
| A9 | | | | | | | | | | |
| A10 | | | | | | | | | | |
| C1 | | | | | | | | | | |
| C2 | | | | | | | | | | |
| C3 | | | | | | | | | | |
| C4 | | | | | | | | | | |
| C5 | | | | | | | | | | |
| C6 | | | | | | | | | | |
| C7 | | | | | | | | | | |
| C8 | | | | | | | | | | |
| C9 | | | | | | | | | | |
| C10 | | | | | | | | | | |
| CSC | | | | | | | | | | |
| CSP | | | | | | | | | | |
| CEP | | | | | | | | | | |
| PGRDM | | | | | | | | | | |
| TLCAN | | | | | | | | | | |
| RDP | | | | | | | | | | |
| **TOTAL** | **51,637,146** | **34,321,520** | **49,943,200** | **8,744,644** | **72,938,706** | **17,688,893** | **22,786,615** | **71,630,375** | **21,085,513** | **27,242,555** |

| *MCS-MX96* | L11 | L12 | L13 | L14 | L15 | L16 | L17 | L18 | K |
|---|---|---|---|---|---|---|---|---|---|
| H1 | 34,114 | 0 | 90,419 | 402,140 | 201,689 | 317,136 | 656,963 | 11,466 | |
| H2 | 161,868 | 27,598 | 273,623 | 1,264,491 | 579,634 | 841,919 | 1,943,629 | 71,563 | |
| H3 | 447,202 | 16,039 | 791,605 | 1,814,527 | 917,084 | 1,812,099 | 2,573,856 | 296,146 | |
| H4 | 1,398,529 | 102,724 | 1,525,610 | 2,892,198 | 939,157 | 2,990,174 | 2,513,676 | 620,562 | |
| H5 | 2,953,741 | 218,124 | 2,689,050 | 3,433,570 | 1,150,654 | 3,637,540 | 2,560,217 | 1,193,788 | |
| H6 | 3,871,040 | 276,220 | 3,668,539 | 3,993,512 | 1,366,647 | 3,378,960 | 1,634,135 | 2,156,088 | |
| H7 | 5,674,773 | 1,051,663 | 6,894,395 | 5,828,849 | 1,620,177 | 4,017,380 | 1,747,354 | 2,900,938 | |
| H8 | 6,703,625 | 2,576,092 | 12,315,227 | 6,586,017 | 1,190,213 | 4,664,227 | 812,214 | 4,517,700 | |
| H9 | 8,801,812 | 6,657,070 | 12,800,583 | 9,355,987 | 2,301,672 | 4,586,745 | 488,344 | 4,445,333 | |
| H10 | 17,695,333 | 30,951,498 | 10,144,241 | 29,202,453 | 1,705,003 | 8,373,453 | 184,443 | 6,284,416 | |
| SOC | | | | | | | | | 1,558,112,676 |
| AAPP | | | | | | | | | |
| IIRE | | | | | | | | | |
| IIMS | | | | | | | | | |
| IP | | | | | | | | | |
| IVA | | | | | | | | | |
| CS | | | | | | | | | |
| PS | | | | | | | | | |
| OT | | | | | | | | | |
| AHBR | | | | | | | | | |
| L1 | | | | | | | | | |
| L2 | | | | | | | | | |
| L3 | | | | | | | | | |
| L4 | | | | | | | | | |
| L5 | | | | | | | | | |
| L6 | | | | | | | | | |
| L7 | | | | | | | | | |
| L8 | | | | | | | | | |
| L9 | | | | | | | | | |
| L10 | | | | | | | | | |
| L11 | | | | | | | | | |
| L12 | | | | | | | | | |
| L13 | | | | | | | | | |
| L14 | | | | | | | | | |
| L15 | | | | | | | | | |
| L16 | | | | | | | | | |
| L17 | | | | | | | | | |
| L18 | | | | | | | | | |
| K | | | | | | | | | |
| A1 | | | | | | | | | |
| A2 | | | | | | | | | |
| AI | | | | | | | | | |
| AII | | | | | | | | | |
| AIII | | | | | | | | | |
| AIV | | | | | | | | | |
| AV | | | | | | | | | |
| AVI | | | | | | | | | |
| AVII | | | | | | | | | |
| AVIII | | | | | | | | | |
| AIX | | | | | | | | | |
| A4 | | | | | | | | | |
| A5 | | | | | | | | | |
| A6 | | | | | | | | | |
| A7 | | | | | | | | | |
| A8 | | | | | | | | | |
| A9 | | | | | | | | | |
| A10 | | | | | | | | | |
| C1 | | | | | | | | | |
| C2 | | | | | | | | | |
| C3 | | | | | | | | | |
| C4 | | | | | | | | | |
| C5 | | | | | | | | | |
| C6 | | | | | | | | | |
| C7 | | | | | | | | | |
| C8 | | | | | | | | | |
| C9 | | | | | | | | | |
| C10 | | | | | | | | | |
| CSC | | | | | | | | | |
| CSP | | | | | | | | | |
| CEP | | | | | | | | | |
| PGRDM | | | | | | | | | |
| TLCAN | | | | | | | | | |
| RDP | | | | | | | | | |
| **TOTAL** | **47,742,037** | **41,877,028** | **51,193,292** | **64,773,744** | **11,971,931** | **34,619,632** | **15,114,831** | **22,498,001** | **1,558,112,676** |

| *MCS-MX96* | A1 | A2 | AI | AII | AIII | AIV | AV | AVI | AVII |
|---|---|---|---|---|---|---|---|---|---|
| H1 | | | | | | | | | |
| H2 | | | | | | | | | |
| H3 | | | | | | | | | |
| H4 | | | | | | | | | |
| H5 | | | | | | | | | |
| H6 | | | | | | | | | |
| H7 | | | | | | | | | |
| H8 | | | | | | | | | |
| H9 | | | | | | | | | |
| H10 | | | | | | | | | |
| SOC | | | | | | | | | |
| AAPP | | | | | | | | | |
| IIRE | | | | | | | | | |
| IIMS | 3,746,676 | 22,794,764 | 29,042,834 | -3,521,456 | 800,877 | 84,949 | 2,759,321 | 5,423,886 | 8,168,605 |
| IP | 319,811 | 105,114 | 630,577 | 209,260 | 71,082 | 121,054 | 380,240 | 130,396 | 108,453 |
| IVA | | | | | | | | | |
| CS | 1,771,377 | 661,483 | 2,094,927 | 1,147,318 | 276,644 | 662,129 | 2,147,693 | 555,165 | 347,051 |
| PS | | | | | | | | | |
| OT | | | | | | | | | |
| AHBR | | | | | | | | | |
| L1 | 90,471 | 587,467 | 212,788 | 216,389 | 0 | 287,501 | 1,369,945 | 411,747 | 0 |
| L2 | 55,604 | 193,875 | 437,080 | 98,078 | 42,686 | 160,043 | 1,234,162 | 50,843 | 20,880 |
| L3 | 1,128 | 54,907 | 0 | 0 | 0 | 0 | 0 | 0 | 71,473 |
| L4 | 0 | 0 | 0 | 70,352 | 0 | 497,292 | 118,877 | 0 | 0 |
| L5 | 581,858 | 128,111 | 2,563,799 | 896,424 | 17,143 | 972,148 | 3,940,106 | 1,262,334 | 266,558 |
| L6 | 15,879,286 | 16,248 | 166,326 | 21,761 | 105,801 | 0 | 51,933 | 9,360 | 0 |
| L7 | 33,128 | 661,905 | 1,336,677 | 1,189,067 | 150,893 | 483,158 | 2,536,298 | 418,238 | 462,856 |
| L8 | 51,578 | 1,438,839 | 4,763,595 | 4,374,080 | 1,564,871 | 848,469 | 1,230,157 | 2,218,464 | 804,934 |
| L9 | 6,790 | 313,913 | 1,264,553 | 2,887,891 | 126,169 | 723,784 | 2,971,033 | 265,694 | 802,147 |
| L10 | 38,811 | 673,482 | 1,710,468 | 571,659 | 418,494 | 242,605 | 1,124,471 | 449,672 | 307,145 |
| L11 | 421,834 | 492,289 | 841,346 | 80,981 | 154,649 | 75,831 | 574,570 | 87,680 | 371,109 |
| L12 | 109,007 | 620,628 | 1,732,475 | 99,055 | 49,753 | 754,087 | 742,171 | 0 | 183,593 |
| L13 | 54,741 | 750,092 | 810,059 | 451,951 | 28,916 | 799,394 | 1,731,804 | 161,480 | 102,290 |
| L14 | 67,364 | 69,284 | 3,849,734 | 230,182 | 39,409 | 205,318 | 3,003,855 | 124,357 | 53,686 |
| L15 | 41,447 | 0 | 770,611 | 80,739 | 3,044 | 136,369 | 27,847 | 0 | 0 |
| L16 | 43,817 | 221,683 | 212,381 | 26,329 | 33,698 | 302,013 | 228,500 | 17,116 | 0 |
| L17 | 12,078 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| L18 | 103,164 | 346,678 | 133,488 | 99,436 | 11,909 | 87,800 | 443,684 | 36,529 | 0 |
| K | 120,068,213 | 28,418,388 | 102,815,880 | 26,202,334 | 8,979,581 | 14,020,010 | 55,560,267 | 26,071,394 | 26,233,148 |
| A1 | 28,084,519 | 1,560 | 132,579,847 | 2,796,998 | 4,223,526 | 499,157 | 2,427,429 | 30,451 | 0 |
| A2 | 99,564 | 4,518,292 | 48,441 | 52,856 | 0 | 72,687 | 16,885,269 | 4,306,590 | 14,757,229 |
| AI | 13,921,976 | 575 | 57,519,323 | 3,329,997 | 12,166 | 1,165,628 | 3,570,222 | 0 | 0 |
| AII | 1,069,750 | 191,276 | 1,160,066 | 37,105,991 | 1,158,411 | 342,346 | 1,647,817 | 310,398 | 258,212 |
| AIII | 172,316 | 16,525 | 41,895 | 139,234 | 6,863,217 | 840,918 | 154,558 | 18,580 | 0 |
| AIV | 269,197 | 79,335 | 2,600,423 | 1,290,820 | 147,036 | 20,537,560 | 3,721,074 | 1,607,792 | 331,847 |
| AV | 14,601,394 | 1,462,951 | 5,395,956 | 13,487,161 | 1,693,175 | 3,323,515 | 76,406,230 | 4,312,621 | 3,258,693 |
| AVI | 278,593 | 431,493 | 2,029,298 | 32,228 | 138,021 | 26,098 | 1,254,502 | 5,508,273 | 427,095 |
| AVII | 158,646 | 569,439 | 872,620 | 132,964 | 229,336 | 595,149 | 783,278 | 407,264 | 22,943,678 |
| AVIII | 2,508,909 | 3,454,952 | 7,286,615 | 1,398,720 | 1,291,236 | 1,187,490 | 3,599,647 | 2,997,244 | 6,439,648 |
| AIX | 783,517 | 224,054 | 25,074 | 1,181,180 | 5,577 | 1,436,729 | 321,634 | 6,783 | 8,243 |
| A4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A5 | 622,984 | 675,037 | 1,271,246 | 587,462 | 215,545 | 1,053,023 | 6,342,473 | 2,533,170 | 2,159,915 |
| A6 | 3,623,496 | 2,049,723 | 14,851,921 | 9,793,577 | 4,279,012 | 3,771,576 | 11,850,741 | 2,594,293 | 4,973,838 |
| A7 | 1,913,084 | 2,350,051 | 8,704,521 | 4,396,976 | 2,021,441 | 1,676,661 | 7,866,082 | 1,684,974 | 2,749,702 |
| A8 | 1,553,885 | 647,542 | 2,396,142 | 2,293,036 | 1,075,306 | 1,516,130 | 2,663,703 | 1,204,691 | 789,588 |
| A9 | 667,170 | 988,146 | 5,546,000 | 1,119,283 | 475,733 | 926,516 | 3,359,883 | 1,510,830 | 851,022 |
| A10 | | | | | | | | | |
| C1 | | | | | | | | | |
| C2 | | | | | | | | | |
| C3 | | | | | | | | | |
| C4 | | | | | | | | | |
| C5 | | | | | | | | | |
| C6 | | | | | | | | | |
| C7 | | | | | | | | | |
| C8 | | | | | | | | | |
| C9 | | | | | | | | | |
| C10 | | | | | | | | | |
| CSC | | | | | | | | | |
| CSP | | | | | | | | | |
| CEP | | | | | | | | | |
| PGRDM | | | | | | | | | |
| TLCAN | 29,303,352 | 2,803,637 | 17,315,392 | 14,531,954 | 2,403,487 | 12,773,098 | 63,011,932 | 4,305,767 | 16,085,401 |
| RDP | 2,463,225 | 1,911,096 | 8,731,296 | 2,399,644 | 430,275 | 1,404,665 | 17,088,058 | 1,624,017 | 6,481,387 |
| **TOTAL** | **245,593,760** | **80,924,835** | **423,765,674** | **131,501,911** | **39,538,119** | **74,612,898** | **305,131,466** | **72,658,093** | **120,819,425** |

| *MCS-MX96* | AVIII | AIX | A4 | A5 | A6 | A7 | A8 | A9 | A10 |
|---|---|---|---|---|---|---|---|---|---|
| H1 | | | | | | | | | |
| H2 | | | | | | | | | |
| H3 | | | | | | | | | |
| H4 | | | | | | | | | |
| H5 | | | | | | | | | |
| H6 | | | | | | | | | |
| H7 | | | | | | | | | |
| H8 | | | | | | | | | |
| H9 | | | | | | | | | |
| H10 | | | | | | | | | |
| SOC | | | | | | | | | |
| AAPP | | | | | | | | | |
| IIRE | | | | | | | | | |
| IIMS | 41,412,175 | 2,409,718 | 9,042,998 | -9,811,545 | 325,631 | 3,454,455 | 16,148,349 | 3,920,231 | 0 |
| IP | 724,323 | 65,276 | 528,296 | 1,303,453 | 1,078,075 | 785,818 | 1,442,130 | 1,198,915 | 487,428 |
| IVA | | | | | | | | | |
| CS | 3,957,423 | 381,578 | 5,086,875 | 1,000,865 | 10,899,956 | 5,906,415 | 3,180,777 | 19,828,157 | 6,782,330 |
| PS | | | | | | | | | |
| OT | | | | | | | | | |
| AHBR | | | | | | | | | |
| L1 | 2,073,210 | 473,972 | 2,786,625 | 506,206 | 1,209,771 | 1,640,706 | 8,276,244 | 25,002,223 | 6,491,882 |
| L2 | 2,365,269 | 233,598 | 1,024,201 | 1,902,923 | 1,482,082 | 1,637,703 | 3,343,350 | 16,160,147 | 3,856,190 |
| L3 | 0 | 0 | 0 | 26,954 | 0 | 0 | 71,411 | 48,869,837 | 488,464 |
| L4 | 0 | 0 | 0 | 0 | 279,644 | 0 | 732,583 | 6,902,463 | 143,432 |
| L5 | 4,758,361 | 675,208 | 2,499,953 | 551,425 | 11,124,422 | 6,891,013 | 5,556,187 | 19,611,961 | 10,641,695 |
| L6 | 0 | 21,144 | 42,588 | 3,976 | 224,432 | 0 | 8,485 | 169,789 | 214,636 |
| L7 | 5,974,686 | 160,493 | 5,195,418 | 350,492 | 225,103 | 626,217 | 176,492 | 1,269,510 | 1,312,585 |
| L8 | 6,435,055 | 642,116 | 21,026,688 | 992,818 | 4,342,838 | 1,320,043 | 392,842 | 16,851,907 | 1,240,927 |
| L9 | 9,660,903 | 773,344 | 133,373 | 211,434 | 144,496 | 76,889 | 22,047 | 184,655 | 145,250 |
| L10 | 2,336,978 | 77,679 | 12,968,941 | 452,277 | 1,006,701 | 298,904 | 24,554 | 3,901,635 | 527,199 |
| L11 | 1,020,788 | 0 | 2,023,712 | 335,535 | 3,242,498 | 34,351,602 | 178,499 | 1,035,692 | 2,219,256 |
| L12 | 1,396,056 | 292,159 | 824,092 | 2,673,418 | 4,148,622 | 3,000,868 | 2,761,893 | 10,114,446 | 12,374,705 |
| L13 | 2,095,261 | 200,752 | 977,701 | 1,664,350 | 6,830,614 | 5,425,192 | 4,283,337 | 12,384,841 | 12,029,490 |
| L14 | 332,083 | 147,292 | 34,951 | 0 | 53,298,279 | 395,163 | 1,414,606 | 846,181 | 139,813 |
| L15 | 0 | 4,173 | 0 | 160,952 | 9,870,585 | 72,130 | 26,449 | 623,086 | 0 |
| L16 | 377,196 | 55,473 | 161,313 | 88,899 | 9,798,080 | 2,106,320 | 1,645,340 | 15,305,628 | 3,232,216 |
| L17 | 0 | 0 | 0 | 0 | 88,643 | 17,173 | 52,381 | 14,709,501 | 0 |
| L18 | 476,567 | 32,169 | 819,802 | 18,246 | 934,098 | 798,545 | 2,622,599 | 2,976,186 | 12,299,719 |
| K | 96,336,866 | 9,524,706 | 39,337,932 | 14,611,689 | 374,067,169 | 168,494,708 | 252,205,278 | 193,684,998 | 1,480,115 |
| A1 | 0 | 595,766 | 0 | 5,862 | 0 | 0 | 0 | 1,622,405 | 925,524 |
| A2 | 2,161,175 | 2,117,411 | 6,046,711 | 8,636,385 | 0 | 1,043 | 93,107 | 51,509 | 17,069 |
| AI | 28,151 | 208,174 | 0 | 4,129 | 0 | 0 | 0 | 1,850,043 | 443,155 |
| AII | 3,982,616 | 742,606 | 693,844 | 464,965 | 2,897,916 | 915,464 | 359,892 | 4,523,033 | 723,849 |
| AIII | 6,672,085 | 302,377 | 6,163,631 | 109,494 | 29,931 | 9,282 | 79,332 | 137,369 | 16,682 |
| AIV | 4,205,845 | 1,124,279 | 870,689 | 315,064 | 7,635,666 | 774,401 | 2,925,409 | 4,845,698 | 1,326,555 |
| AV | 19,606,291 | 3,667,904 | 5,919,447 | 1,737,228 | 6,315,471 | 21,962,176 | 2,538,050 | 11,246,254 | 1,003,069 |
| AVI | 7,827,167 | 874,713 | 22,346,084 | 169,030 | 282,467 | 103,108 | 1,675,081 | 1,870,233 | 979,700 |
| AVII | 42,681,435 | 1,195,503 | 20,684,811 | 164,789 | 592,271 | 346,897 | 171,684 | 335,773 | 46,685 |
| AVIII | 239,281,879 | 1,210,845 | 19,505,373 | 4,371,290 | 9,043,751 | 35,006,882 | 2,479,048 | 23,001,390 | 1,439,046 |
| AIX | 2,226,177 | 10,273,294 | 796,809 | 612,366 | 1,448,485 | 806,184 | 4,653,387 | 7,613,901 | 2,247,742 |
| A4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A5 | 2,575,615 | 149,819 | 624,086 | 3,924,757 | 4,046,441 | 716,437 | 3,758,548 | 1,199,368 | 2,147,159 |
| A6 | 38,621,346 | 2,953,752 | 10,725,625 | 4,995,668 | 14,449,711 | 12,378,789 | 4,960,483 | 11,824,529 | 2,440,080 |
| A7 | 17,364,312 | 1,332,118 | 11,291,585 | 1,583,441 | 19,626,500 | 21,509,522 | 4,870,562 | 13,787,860 | 4,154,214 |
| A8 | 8,969,115 | 744,176 | 6,753,243 | 1,112,242 | 32,752,485 | 4,607,315 | 67,966,372 | 17,748,026 | 7,292,220 |
| A9 | 9,528,883 | 251,759 | 7,815,065 | 1,384,923 | 58,911,470 | 18,435,038 | 23,968,765 | 35,943,537 | 9,451,527 |
| A10 | | | | | | | | | |
| C1 | | | | | | | | | |
| C2 | | | | | | | | | |
| C3 | | | | | | | | | |
| C4 | | | | | | | | | |
| C5 | | | | | | | | | |
| C6 | | | | | | | | | |
| C7 | | | | | | | | | |
| C8 | | | | | | | | | |
| C9 | | | | | | | | | |
| C10 | | | | | | | | | |
| CSC | | | | | | | | | |
| CSP | | | | | | | | | |
| CEP | | | | | | | | | |
| PGRDM | | | | | | | | | |
| TLCAN | 178,303,101 | 24,172,154 | 0 | 913,478 | 5,263,684 | 14,847,991 | 7,473,021 | 1,937,279 | |
| RDP | 50,089,148 | 10,468,198 | 0 | 0 | 1,328,076 | 3,746,286 | 1,885,513 | 488,794 | |
| **TOTAL** | **815,857,540** | **78,555,700** | **224,752,461** | **47,549,479** | **659,246,063** | **373,466,680** | **434,424,086** | **555,578,990** | **110,761,608** |

| *MCS-MX96* | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 |
|---|---|---|---|---|---|---|---|---|---|---|
| H1 | | | | | | | | | | |
| H2 | | | | | | | | | | |
| H3 | | | | | | | | | | |
| H4 | | | | | | | | | | |
| H5 | | | | | | | | | | |
| H6 | | | | | | | | | | |
| H7 | | | | | | | | | | |
| H8 | | | | | | | | | | |
| H9 | | | | | | | | | | |
| H10 | | | | | | | | | | |
| SOC | | | | | | | | | | |
| AAPP | | | | | | | | | | |
| IIRE | | | | | | | | | | |
| IIMS | | | | | | | | | | |
| IP | | | | | | | | | | |
| IVA | 2,217,896 | 2,484,754 | 14,430,338 | 7,437,949 | 0 | 10,965,606 | 3,094,047 | 2,848,888 | 33,960,200 | 12,655,440 |
| CS | | | | | | | | | | |
| PS | | | | | | | | | | |
| OT | | | | | | | | | | |
| AHBR | | | | | | | | | | |
| L1 | | | | | | | | | | |
| L2 | | | | | | | | | | |
| L3 | | | | | | | | | | |
| L4 | | | | | | | | | | |
| L5 | | | | | | | | | | |
| L6 | | | | | | | | | | |
| L7 | | | | | | | | | | |
| L8 | | | | | | | | | | |
| L9 | | | | | | | | | | |
| L10 | | | | | | | | | | |
| L11 | | | | | | | | | | |
| L12 | | | | | | | | | | |
| L13 | | | | | | | | | | |
| L14 | | | | | | | | | | |
| L15 | | | | | | | | | | |
| L16 | | | | | | | | | | |
| L17 | | | | | | | | | | |
| L18 | | | | | | | | | | |
| K | | | | | | | | | | |
| A1 | 50,612,167 | 0 | 414,392 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A2 | 1,047,671 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AI | 281,778,613 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AII | 0 | 23,859,182 | 0 | 1,043,972 | 0 | 0 | 0 | 2,019,536 | 0 | 4,512,415 |
| AIII | 0 | 0 | 0 | 5,521,194 | 0 | 0 | 0 | 0 | 0 | 0 |
| AIV | 0 | 0 | 8,779 | 2,005,142 | 0 | 0 | 1,494,802 | 8,704,562 | 0 | 0 |
| AV | 0 | 0 | 97,095 | 10,725,892 | 6,118,704 | 22,148,212 | 0 | 0 | 0 | 15,059,125 |
| AVI | 0 | 0 | 0 | 13,055,534 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVII | 0 | 0 | 811,747 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AVIII | 0 | 0 | 0 | 6,896,357 | 0 | 25,686,794 | 8,204,445 | 0 | 0 | 2,584,932 |
| AIX | 0 | 0 | 429,241 | 650,213 | 963,671 | 0 | 980,294 | 1,230,125 | 0 | 0 |
| A4 | 0 | 0 | 495,939 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A5 | 0 | 0 | 12,084,723 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| A6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 333,489,100 | 0 |
| A7 | 0 | 0 | 0 | 0 | 0 | 142,486,337 | 0 | 967,108 | 0 | 59,952,199 |
| A8 | 0 | 0 | 233,623,520 | 0 | 9,212,847 | 0 | 0 | 0 | 0 | 29,502,503 |
| A9 | 0 | 541,096 | 7,071,728 | 33,142,341 | 36,763,012 | 8,389,859 | 35,116,347 | 89,181,337 | 0 | 21,642,734 |
| A10 | | | | | | | | | | |
| C1 | | | | | | | | | | |
| C2 | | | | | | | | | | |
| C3 | | | | | | | | | | |
| C4 | | | | | | | | | | |
| C5 | | | | | | | | | | |
| C6 | | | | | | | | | | |
| C7 | | | | | | | | | | |
| C8 | | | | | | | | | | |
| C9 | | | | | | | | | | |
| C10 | | | | | | | | | | |
| CSC | | | | | | | | | | |
| CSP | | | | | | | | | | |
| CEP | | | | | | | | | | |
| PGRDM | | | | | | | | | | |
| TLCAN | | | | | | | | | | |
| RDP | | | | | | | | | | |
| **TOTAL** | **335,656,347** | **26,885,032** | **269,467,501** | **80,478,594** | **53,058,233** | **209,676,808** | **48,889,935** | **104,951,557** | **367,449,300** | **145,909,347** |

| *MCS-MX96* | CSC | CSP | CEP | PGRDM | TLCAN | RDP | *TOTAL* |
|---|---|---|---|---|---|---|---|
| H1 | | | | | | | **30,781,621** |
| H2 | | | | | | | **56,536,239** |
| H3 | | | | | | | **71,967,842** |
| H4 | | | | | | | **93,077,637** |
| H5 | | | | | | | **110,933,233** |
| H6 | | | | | | | **140,740,134** |
| H7 | | | | | | | **176,998,468** |
| H8 | | | | | | | **211,586,039** |
| H9 | | | | | | | **301,564,371** |
| H10 | | | | | | | **691,709,834** |
| SOC | | | | | | | **1,558,112,676** |
| AAPP | | | | | | | **420,704,346** |
| IIRE | | | | | | | **118,028,898** |
| IIMS | | | | | | | **136,202,471** |
| IP | | | | | | | **9,689,701** |
| IVA | | | | | | | **90,095,116** |
| CS | | | | | | | **66,688,160** |
| PS | | | | | | | **29,427,283** |
| OT | | | | 34,423,120 | | | **42,392,016** |
| AHBR | | | | 16,556,138 | | | **583,558,024** |
| L1 | | | | 0 | | | **51,637,146** |
| L2 | | | | 22,804 | | | **34,321,520** |
| L3 | | | | 359,026 | | | **49,943,200** |
| L4 | | | | 0 | | | **8,744,644** |
| L5 | | | | 0 | | | **72,938,706** |
| L6 | | | | 753,128 | | | **17,688,893** |
| L7 | | | | 223,397 | | | **22,786,615** |
| L8 | | | | 1,090,154 | | | **71,630,375** |
| L9 | | | | 371,147 | | | **21,085,513** |
| L10 | | | | 110,879 | | | **27,242,555** |
| L11 | | | | 234,167 | | | **47,742,037** |
| L12 | | | | 0 | | | **41,877,028** |
| L13 | | | | 411,030 | | | **51,193,292** |
| L14 | | | | 522,187 | | | **64,773,744** |
| L15 | | | | 154,499 | | | **11,971,931** |
| L16 | | | | 763,632 | | | **34,619,632** |
| L17 | | | | 235,056 | | | **15,114,831** |
| L18 | | | | 257,381 | | | **22,498,001** |
| K | | | | | | | **1,558,112,676** |
| A1 | | | | | 15,963,940 | 2,516,942 | **245,593,760** |
| A2 | | | | | 15,602,137 | 4,346,270 | **80,924,835** |
| AI | | | | | 18,033,414 | 8,264,153 | **423,765,674** |
| AII | | | | | 21,745,593 | 3,663,727 | **131,501,911** |
| AIII | | | | | 4,835,887 | 124,393 | **39,538,119** |
| AIV | | | | | 3,092,706 | 886,297 | **74,612,898** |
| AV | | | | | 22,426,577 | 14,983,462 | **305,131,466** |
| AVI | | | | | 7,952,291 | 1,262,172 | **72,658,093** |
| AVII | | | | | 13,094,569 | 8,986,377 | **120,819,425** |
| AVIII | | | | | 206,438,093 | 17,229,933 | **815,857,540** |
| AIX | | | | | 13,295,595 | 1,747,205 | **78,555,700** |
| A4 | | | | | 0 | 0 | **224,752,462** |
| A5 | | | | | 861,672 | 0 | **47,549,479** |
| A6 | | | | | 91,740,645 | 22,254,855 | **659,246,063** |
| A7 | | | | | 23,245,322 | 5,638,954 | **373,466,680** |
| A8 | | | | | 0 | 0 | **434,424,086** |
| A9 | | 41,867,183 | 91,077,046 | | 7,366,912 | 1,787,098 | **555,578,990** |
| A10 | 110,761,607 | | | | | | **110,761,607** |
| C1 | | | | | | | **335,656,347** |
| C2 | | | | | | | **26,885,032** |
| C3 | | | | | | | **269,467,501** |
| C4 | | | | | | | **80,478,594** |
| C5 | | | | | | | **53,058,233** |
| C6 | | | | | | | **209,676,808** |
| C7 | | | | | | | **48,889,935** |
| C8 | | | | | | | **104,951,557** |
| C9 | | | | | | | **367,449,300** |
| C10 | | | | | | | **145,909,347** |
| CSC | | | | | | | **110,761,607** |
| CSP | | | | | | | **41,867,183** |
| CEP | | | | | | | **91,077,046** |
| PGRDM | | | | | | | **109,890,529** |
| TLCAN | | | | | | | **395,444,730** |
| RDP | | | | | | | **110,539,676** |
| **TOTAL** | **110,761,607** | **41,867,183** | **91,077,046** | **56,487,744** | **465,695,353** | **93,691,838** | |

**Appendix 3.** The AGEM-MX96

**Production**

Each Activity $j$ ($j=1,\ldots,18$), hires Capital, $K_j$, and Labor, $L_j$, to produce Value Added, $V_j$, through a constant returns to scale Cobb-Douglas technology. Cost minimization implies optimal demands:

$$K_j^* = \left(\frac{V_j}{A_j}\right)\left(\frac{\alpha_{kj}}{p_k}\right)^{1-\alpha_{kj}} \prod_{l=1}^{18}\left(\frac{\left(1+\tau_j^L\right)p_l}{\alpha_{lj}}\right)^{\alpha_{lj}} \qquad \text{(A3.1)}$$

$$L_{lj}^* = \left(\frac{V_j}{A_j}\right)\left(\frac{\alpha_{lj}}{\left(1+\tau_j^L\right)}\right)\left(\frac{p_k}{\alpha_{kj}}\right)^{\alpha_{kj}} \prod_{l=1}^{18}\left(\frac{\left(1+\tau_j^L\right)p_l}{\alpha_{lj}}\right)^{\alpha_{lj}} \qquad \text{(A3.2)}$$

Where, $A_j$ is a (Social Accounting Matrix (SAM) calibrated) scale parameter, and the alphas are (SAM calibrated) share parameters such that $\alpha_{kj} + \sum_{l=1}^{18} \alpha_{lj} = 1$. $\tau_j^L$ is the labor tax (social security contributions) implied by SAM data. $p_k$ and $p_l$ are capital price and type $l$ labor price.

Average price equal to unitary price (perfect competition) implies that value added price, $p_{vj}$, is:

$$p_{vj} = \left(\frac{1}{A_j}\right)\left(\frac{p_k}{\alpha_{kj}}\right)^{\alpha_{kj}} \prod_{l=1}^{18}\left(\frac{\left(1+\tau_j^L\right)p_l}{\alpha_{lj}}\right)^{\alpha_{lj}} \qquad \text{(A3.3)}$$

Then, Activities obtain domestic production, $Y_{di}$, through a Leontief combination of value added, and intermediate consumption $X_{ij}$ ($i=j=1,\ldots,18$). Cost minimization yields optimal quantities:

$$X_{ij}^* = a_{ij} Y_{dj} \qquad \text{(A3.4)}$$

$$V_j^* = v_j Y_{dj} \qquad \text{(A3.5)}$$

Where $a_{ij}$ and $v_j$ are (SAM calibrated) unitary requirements of input $i$ and value added, to produce good $j$.

Average equal to unitary price (perfect competition) implies:

$$p_{dj} = \left(\sum_{i=1}^{18} p_i a_{ij} + p_{vj} v_j\right)\left(1 + \tau_j^P\right) \qquad \text{(A3.6)}$$

Where, $p_{dj}$ is domestic production price, and $\tau_j^P$ are taxes on production implied by SAM data.

Then, Activities obtain total supply,$Y_j$, through a CES combination of domestic production, and imports from the RoW, $Y_{rj}$. Cost minimization yields optimal quantities:

$$Y_{dj}^{*} = \left(\frac{Y_j}{\Phi_j}\right)\left(\frac{\delta_{dj}^{\sigma_j} p_{dj}^{-\sigma_j}}{\left(\delta_{dj}^{\sigma_j} p_{dj}^{1-\sigma_j} + \delta_{rj}^{\sigma_j} p_{rj}^{1-\sigma_j}\right)^{\sigma_j/(\sigma_j-1)}}\right) \qquad \text{(A3.7)}$$

$$Y_{rj}^{*} = \left(\frac{Y_j}{\Phi_j}\right)\left(\frac{\delta_{rj}^{\sigma_j} p_{rj}^{-\sigma_j}}{\left(\delta_{dj}^{\sigma_j} p_{dj}^{1-\sigma_j} + \delta_{rj}^{\sigma_j} p_{rj}^{1-\sigma_j}\right)^{\sigma_j/(\sigma_j-1)}}\right) \qquad \text{(A3.8)}$$

Where, $\Phi_j$ is a (SAM calibrated) scale parameter, $\delta$ is a (SAM calibrated) share parameter, and $\sigma_j$ is the (exogenously estimated) Armington elasticity.

Again, average price equal to unitary price (perfect competition), implies:

$$p_j = \left(\frac{\left(\delta_{dj}^{\sigma_j} p_{dj}^{1-\sigma_j} + \delta_{rj}^{\sigma_j} p_{rj}^{1-\sigma_j}\right)^{1/(1-\sigma_j)}}{\Phi_j}\right) \qquad \text{(A3.9)}$$

Where, $p_j$ is total supply goods price, and $p_{rj}$ is (fixed) imports price.

Finally, private consumption goods, $C_m$, and public consumption goods, $D_n$, are obtained through a Leontief combination of total supply goods. Cost minimization yields optimal quantities:

$$C_{im}^{*} = z_{im} C_m \qquad m=1,\ldots 10 \qquad \text{(A3.10)}$$

$$D_{in}^{*} = d_{in} D_n \qquad n=1,\ldots 3 \qquad \text{(A3.11)}$$

Where, $z_{im}$ is the (SAM calibrated) unitary requirement of input $i$, and $C_{im}^{*}$ is optimal demand for inputs. $d_{in}$ is the (SAM calibrated) unitary requirement of input $i$, and $D_{in}^{*}$ is optimal demand for inputs.

Again, average price equal to unitary price (perfect competition) implies:

$$p_m^c = \left(\sum_{i=1}^{18} p_i z_{im}\right)\left(1 + \tau_m^{vat}\right) \qquad \text{(A3.12)}$$

$$p_n^d = \left(\sum_{i=1}^{18} p_i d_{in}\right) \quad \text{(A3.13)}$$

Where, $p_m^c$ is private consumption good *m* price, and $p_n^d$ is public consumption good *n* price. $\tau_m^{vat}$is the value added tax rate implied by SAM data.

**Households**

Each representative Household *h* (*h=1,…10*), maximizes a CES utility function of present ($C_h$) and future ($S_h$) consumption. Optimal quantities are:

$$C_h^* = \left(\frac{\delta_h}{p_{ch}}\right)^{\sigma_h}\left[\frac{DI_h}{\delta_h^{\sigma_h} p_{ch}^{1-\sigma_h} + (1-\delta_h)^{\sigma_h} p_I^{1-\sigma_h}}\right] \quad \text{(A3.14)}$$

$$S_h^* = \left(\frac{1-\delta_h}{p_I}\right)^{\sigma_h}\left[\frac{DI_h}{\delta_h^{\sigma_h} p_{ch}^{1-\sigma_h} + (1-\delta_h)^{\sigma_h} p_I^{1-\sigma_h}}\right] \quad \text{(A3.15)}$$

Where, $DI_h$ is disposable (after tax) income, and $p_{ch}$ is the price of aggregated present consumption of Household *h*, respectively. $p_I$ is the price of investment. $\delta_h$ is a (SAM calibrated) share parameter, and $\sigma_h$ is the (exogenously estimated) elasticity between present and future consumption.

$DI_h$ is given by:

$$DI_h = \left[\sum_{l=1}^{18} \Theta_{hl} p_l \bar{L}_l + \Theta_{hk} p_k \bar{K}(1-\tau^{KT})\right](1-\tau_h^{IT}) +$$

$$\Theta_{ht} TR + (\Theta_{hl}) e(L_{RoW}) \quad \text{(A3.16)}$$

Where, $\Theta_{hl}$ is Household *h* (SAM calibrated) share in total endowment of labor type *l*, $\bar{L}_l$. $\Theta_{hk}$ is Household *h* (SAM calibrated) share in total endowment of capital, $\bar{K}$. $\tau^{KT}$ is the tax rate on capital, and $\tau^{IT}$ is the income tax (both implied by SAM data). $\Theta_{ht}$ is Household *h* (SAM calibrated) share in total transfers, and *TR* are total transfers to Households.

Aggregated price of present consumption, $p_{ch}$, is the weighted average:

$$p_{ch} = \sum_{m=1}^{10} p_m^c \left(\frac{c_{hm}}{c_h}\right) \quad \text{(A3.17)}$$

Where $C_{hn}$ is the (optimal) quantity of good *m* consumption by household *h*.

Investment price, $p_I$, is an average of the prices of the total supply goods, weighted by its participation in total investment:

$$p_I = \sum_{i=1}^{18} p_i \alpha_{Ii}, \quad \text{whith:} \quad \alpha_{Ii} = \frac{p_i INV_i^0}{\sum_{i=1}^{18} p_i INV_i^0} \qquad \text{(A3.18)}$$

Where, $INV_i^0$ are units of initial investment from Activity *i*.

Finally, Households choose an optimal basket of present consumption goods, $C_{hm}$, maximizing a Cobb-Douglas utility function. Optimal demands are given by:

$$C_{hm}^* = \frac{\beta_{hm} C_h}{p_m} \qquad \text{(A3.19)}$$

**Government**

Government revenues, GR, are given by:

$$GR = TIT + TPT + TSC \qquad \text{(A3.20)}$$

Where *TIT* are takings from income taxes, *TPT* takings from taxes on production, and *TSC* takings from social security contributions (labor taxes).

On the other hand, government expenditures (GE) are defined as:

$$GE=SE_G+OT_G+SAV_G\ CSC_G+PHC_G+PEC_G+PRoW_G \qquad \text{(A3.21)}$$

Where, $SE_G$ are social expenditures, $OT_G$ are other transfers, $CSC_G$ are public savings, $CSC_G$ are collective services consumption, $PHC_G$ public health consumption, $PEC_G$ public education consumption, and $PRoW_G$ payments to the RoW.

Government expenditures could be greater (or smaller) than its revenues, therefore we define a public surplus as:

$$PS = GR - GE \qquad \text{(A3.22)}$$

**Rest of the World**

RoW's income, RoWI, is given by:

$$RoWI = \sum_{i=1}^{18} p_i^{RoW} M_i + \theta_{RoW}^{k} \overline{K} + \mathrm{PRoW_G} \qquad \text{(A3.23)}$$

Where, $p_i^{RoW}$ are the (fixed) prices of imports in foreign currency, $M_i$ are imports of good $i$, $\theta_{RoW}^{k}$ is the RoW's (SAM calibrated) capital share, and $\mathrm{PRoW_G}$ are payments from the government.

On the other hand, RoW's expenditures, RoWE, are given by:

$$RoWE = \sum_{i=1}^{18} p_i^{RoW} EXP_i + OT_{RoW} + \mathrm{SAV_{RoW}} + \mathrm{L_{RoW}} \qquad \text{(A3.24)}$$

Where, $p_i^{RoW}$ are the (fixed) prices of exports in foreign currency, $EXP_i$ are exports of good $i$, $OT_{RoW}$ are other transfers from the RoW, $SAV_{RoW}$ are RoW's savings, and $\mathrm{L_{RoW}}$ is labor income from abroad.

**Closures**

Capital and labor endowments are part of the system's constraints: For the base simulations total employment of factors is assumed:

$$\sum_{i=1}^{18} K_i^s = \overline{K} \qquad \text{(A3.25)}$$

$$\sum_{i=1}^{18} L_{it}^s = \overline{L_i} \qquad \text{(A3.26)}$$

Investment equals savings:

$$\sum_{i=1}^{18} p_i INV_i = \sum_{h=1}^{10} SAV_h + \overline{SAV_k} + SAV_{RoW} + SAV_{GOV} \qquad \text{(A3.28)}$$

Where, $SAV_h$ are Households savings, $\overline{SAV_k}$ are (constant) capital savings, $SAV_{RoW}$ are RoW savings, and $SAV_{GOV}$ are Government savings.

Finally, total supply equals total demand for every good and service:

$$Y_j = \sum_{i=1}^{18} X_{ij} + \sum_{m=1}^{10} C_{mj} + \sum_{n=1}^{8} D_{nj} + EXP_j + INV_j \qquad \text{(A3.27)}$$