# Economic Lifecycle and Intergenerational Redistribution: Mexico, 2004

Iván Mejía-Guevara

ABSTRACT

This article discusses the construction of the economic lifecycle deficit for Mexico and analyzes the Mexican system of transfers and asset reallocation. The National Transfer Accounts methodology and data from 2004 were used to generate the estimations. The magnitude of the lifecycle deficit and intergenerational redistribution are analyzed by age group. Net transfers constitute the most important means of addressing the deficit among young people, whereas asset-based reallocations are the main mechanism for overcoming the deficit among the elderly. In fact, the deficit in old age can be overcome almost via asset-based reallocations, since the majority of the positive support of public transfers is nullified by the negative effect of private transfers from the elderly to younger population. The article also examines the role of oil revenues within the intergenerational framework.

Research reported in this study is based on analysis conducted as part of the National Transfer Account Project with core funding from the National Institutes of Health, NIA, R01-AG025488 and NIA, R37-AG025247. Very important funding was also received from IDRC in the context of the IDRC/ECLAC Project. Other resources have been received from the National Council of Population of Mexico (CONAPO) and MacArthur Foundation. The author thanks to the people who have supported this work in many ways and for the recommendations and discussions which have contributed with its realization. Special thanks to Dr. Andrew Mason and Dr. Ronald Lee for the opportunity to be part of the NTA Project. To Dr. Karen O. Mason for her support and valuable comments. To Dr. Sang-Hyop Lee and Dr. An-Chi Tung for all their recommendations. A special thank to Dr. Amonthep Chawla for all technical guidelines and support for NTA estimates. To M.A. Octavio Mojarro Dávila, Dr. Virgilio Partida Bush, M.A. Elena Zuñiga and M.A. Félix Vélez Fernández Varela for the support of this Project within Mexico.

# Introduction

Mexico is a middle-income country that is undergoing an advanced demographic transition. This demographic transition is playing an important role in the society's development, offering not only opportunities but challenges as well. This paper uses the National Transfer Accounts (NTA) methodology to study the relationship between the economy and demographic changes in a framework that allows for intergenerational reallocation among different age groups while being consistent at the aggregate level (Mason et al. 2009). Previously other methodologies have been used to study the economic impact of Mexico's demographic transition (Mojarro and Mejía-Guevara 2005).

Using data from 2004, I estimate the lifecycle deficit and the intergenerational redistribution of economic flows that has occurred through transfers and asset-based reallocations, and then analyze the results. The reallocation methods and macroeconomic adjustment are discussed in the context of Mexico's economic situation. I point out the relative importance of net private and public transfers in supporting the lifecycle deficit and note the role of asset-based reallocations.

The article is organized as follows. The next two sections describe salient characteristics of Mexico's demographic evolution and notable aspects of the Mexican economy that are related to the results of the analysis. Then I present the principal results from the estimation of the NTA components for 2004, focusing on the most relevant elements of the components. The paper concludes with some observations about the implications of the findings.

## Mexico's Demographic Transition

According to the United Nations (ECLAC 2008), Mexico is one of seven Latin-American countries that are undergoing an advanced phase of the demographic transition.[1] The main characteristic of this stage is the achievement of both low fertility and low mortality rates. CONAPO (2008) estimates that Mexico's total fertility rate (TFR) reached the replacement level in 2008. In the same year its mortality rate was 4.9 deaths per 1,000 inhabitants and life expectancy at birth was 72.7 years for men and 77.5 for women. These indices, when compared with those just a few years earlier, reveal how rapid Mexico's transition has been. That is, during the period 1970-1975, TFR was 6.5 per woman, crude mortality rate was 9.1 and life expectancy at birth was 60.1 for men and 65.2 for women (UN Population Division 2009). Therefore, the main reason is the impressive decrease in fertility since the late 1960s, when the TFR was around 6.8 births per woman. By 2005 it had declined to 2.2. Projections for 2050 indicate that Mexico will experience only a modest additional reduction in fertility, reaching a TFR of 1.85 in that year, but that the mortality rate will rise to 9.8 as a result of the aging of the population (CONAPO 2008).

Mexico's total population estimated for 2008 was 106.7 million—8.2 million, or 8.4 percent, more than in 2000 (CONAPO 2008). The age composition of the population for 2008 was estimated as follows: 31.3 million in the 0–14 age group, 69.4 million in the 15–64 age group, and 6.0 million in the 65+ age group. This composition will change dramatically by 2050, when the total population is projected to be 121.9 million and the shares of the young, working-age, and elderly age groups are projected at 20.5 million, 75.5 million, and 25.9 million, respectively. In other words, although the total population will increase by 14 percent, the young age group will shrink in relative terms by 35 percent, whereas the 65+ age

[1] The other countries are Argentina, Uruguay, Chile, Colombia, Brazil, and Costa Rica.

group will grow more than four times. Meanwhile, the working-age group is expected to increase by only 9 percent over the same period.

## The Economy

Mexico is a middle-income economy, where per capita GDP in 2007 was approximately US $14,120 PPP and estimated at $14,582 for 2008. In 2007 Mexico registered the highest per capita GDP among the NTA Latin American country members (Brazil, Chile, Costa Rica, Mexico, and Uruguay). It was followed by Chile ($ 13,921), Uruguay ($11,674), Costa Rica ($10,358), and Brazil ($9,703). The International Monetary Fund estimated, however, that Chile would register the highest per capita income in 2008 and 2009, followed by Mexico (IMF 2009).

US dollars play an important role in the Mexican economy, and the three major sources of dollars are direct foreign investment, remittances, and oil exports. Between 2002 and the first semester of 2007, the cumulative value of direct foreign investments reached US$110,920.2 million, averaging about 2.8 percent of GDP. The first semester of 2007 saw the historically highest value of such investment, probably reflecting the confidence of foreign investors in the evolution of the Mexican economy (SHCP 2007). In early 2006 remittances were US $23,053.7 million, or 2.7 percent of GDP; this was three times the amount registered in 2000. Since the second semester of 2006, however, the rate of growth of remittances has declined, mainly because of the deceleration of the US economy (SHCP 2007).

Because the extraction and commercialization of oil resources are such an important source of revenue for Mexico's public sector, fluctuation of international oil prices is an issue that the government considers when making projections of its annual revenues. The tremendous increase in oil prices in recent years has provided the government with a significant amount of revenue, but various factors have prevented it from taking full

advantage of the favorable fluctuations. These include bad management of the national enterprise Petróleos Mexicanos (PEMEX), overdependence of the federal government on oil revenues to compensate for low tax revenues, the necessity of importing value-added products derived from oil (such as gasoline) because of the Mexican industry's incapacity to produce a sufficient amount of them to satisfy local demand, and the lack of transparency in the allocation and expenditure of these extra revenues. Moreover, the global economic crisis in 2008 was followed by substantial drops in international oil prices.

## National Transfer Flow Accounts for Mexico

Using the methodology described by R. Lee, S.-H. Lee, and Mason (2008), Mason et al. (2009), and the NTA website (NTA 2009), I estimated national transfer accounts for Mexico in 2004. The main source of information at the micro-level was the Household Income and Expenditure Survey for 2004, called ENIGH-2004 (INEGI 2008a). For macroeconomic adjustments of the profiles, the main source was the System of National Accounts of Mexico, which the Ministry of Statistics administers (INEGI 2006). For 2004, this source is consistent with the 1993 National System of Accounts of the United Nations (UN Statistics Division 2008). I also used some information from administrative records provided by the Ministry of Finance (SHCP 2008) and the Ministry of Statistics (INEGI 2008b). The principal NTA components, described here; are lifecycle deficit, public and private transfers, and asset-based reallocations.

### Lifecycle Deficit

The lifecycle deficit is defined as the difference between consumption (C) and labor income (YL). I estimated labor income by using information from ENIGH-2004 at the individual level; therefore, no age allocation was necessary to derive earnings or entrepreneurial income profiles, the components of YL. Following Mejía-Guevara (2008), I imputed part of

entrepreneurial income to take into account people who work as unpaid family workers in family-based enterprises. This adjustment was implemented as indicated in R. Lee, S.-H. Lee, and Mason (2008). An important assumption of the adjustment is that two-thirds of entrepreneurial income is a return to labor.

Figure 1, which displays the income profile and its components, indicates that the earnings profile consistently increases from age 14 to age 39, when it suffers a small decline, then increases again, reaching its maximum level at age 41. The rate of growth is highest between ages 14 and 24. After age 41 earnings decline almost consistently but moderately until age 58, after which the decline is more rapid. Earnings drop substantially lower than entrepreneurial income after age 62.

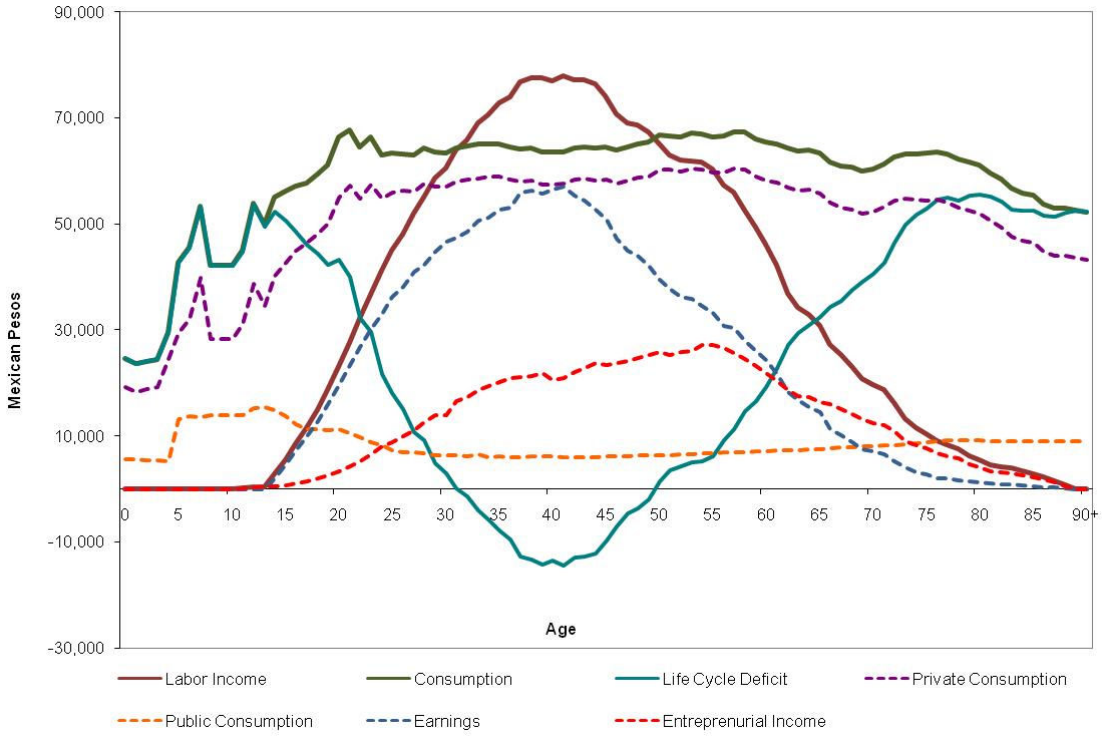


Figure 1. Per capita consumption, labor income, and lifecycle deficit: Mexico, 2004

Entrepreneurial income is evident from age 10, reflecting the fact that many Mexican children participate in labor activities, as reported in the ENIGH-2004. The maximum level observed for the entrepreneurial profile is at age 54, 13 years after the earnings profile peaks.

The decline among entrepreneurs after age 54 is slower than that observed for the earnings profile and is reflected in the slow decline of the total labor income. It should be noted that many people continue working after the official retirement ages -at least 65 years for old age retirement or 60 in the case of severance at old age (SEGOB DOF 2009b)-, since many of them do not receive benefits from the social security system or their benefits may be insufficient to meet their needs. In the past many people retired early, taking advantage of the Social Security Law's earlier flexibility, and this could help to explain why the earnings profile starts to decline so early.

Figure 1 shows separate profiles for public and private consumption. Details of the estimation methods used to construct the profiles can be found in Mejía-Guevara (2008). Private consumption accounts for most of total consumption since, in aggregate terms, public consumption represents only about 16 percent of the total. Some peaks can be observed in total consumption at young ages, due to the enormous influence that both private and public education consumption have on the profile. For productive ages, the total consumption profile exhibits small variations and looks practically flat, until around age 59, when it starts declining. It increases again between ages 70 and 76, and thereafter declines for all subsequent ages, with small variations at the oldest ages.

In Mexico the average period of net production, when YL is higher than consumption, lasts for only 18 years, which is probably the shortest period among NTA country members. The age at which consumption becomes lower than labor income for the first time is 32; at age 50 consumption begins to exceed labor income again. In aggregate terms, the lifecycle deficit for young people is much greater than it is for older groups, among whom it is only 13.6 percent of the total—leaving the surplus for working groups out. However, Figure 1 shows that the per capita deficit is very similar for both groups. The total deficit is also much greater than the surplus for those of ages 32–49, the surplus being only about 8.3 percent of

the deficit in absolute terms. Therefore, working age groups could support only about 61 percent of the deficit of older groups with their labor income. It should be noted, however, that the short surplus span in Mexico is not attributable to the shape of the profiles per se but rather to the fact that aggregate consumption is much higher than total labor income; i.e., the ratio of C to YL is around 1.7 (estimate based on economic aggregates). A different surplus period (22 years) was reported in Mejía-Guevara (2008), but the difference can be explained by the government's treatment of oil revenues, discussed below.

Another interesting result from the lifecycle deficit estimation is the net direction of flows obtained from the income and consumption profiles. The average unit of income ($A_{YL}$) is earned at age 38 and consumed at age 30 ($A_c$). Since the difference, $A_c - A_{YL,}$ is negative, there is a demand for credit; in other words, income is consumed before it is earned. A high level of spending on education and the young age structure of the population may be responsible for this negative demand for wealth.

By disaggregating the lifecycle deficit we can observe that in Mexico young dependents (ages 0–19) produce approximately 7 percent of their total consumption, whereas older dependents (ages 60+) produce around 37 percent. That is, older dependents support their consumption to a greater extent through their labor income, as compared with other sources of support, than do younger dependents.

**Public Transfers**

Following the NTA methodology, I divided public transfers into inflows and outflows, treating in-kind, cash and pension transfers as inflows, and taxes and social security contributions as outflows. The procedure used for the estimation of the respective profiles was as follows.

In-kind transfers are defined in the same way as public consumption, their components being education, health care, and "other" (for example, public administration and

defence). As Figure 2 indicates, education transfers benefit mostly young groups whereas health-care transfers benefit mostly the elderly. Other public in-kind transfers were assigned on a per capita basis since there is no distinction by age in their allocation. The participation of the education expenditure by level of education was taken from SHCP (2008). Details about the estimation of the profiles can be found in Mejía-Guevara (2008).

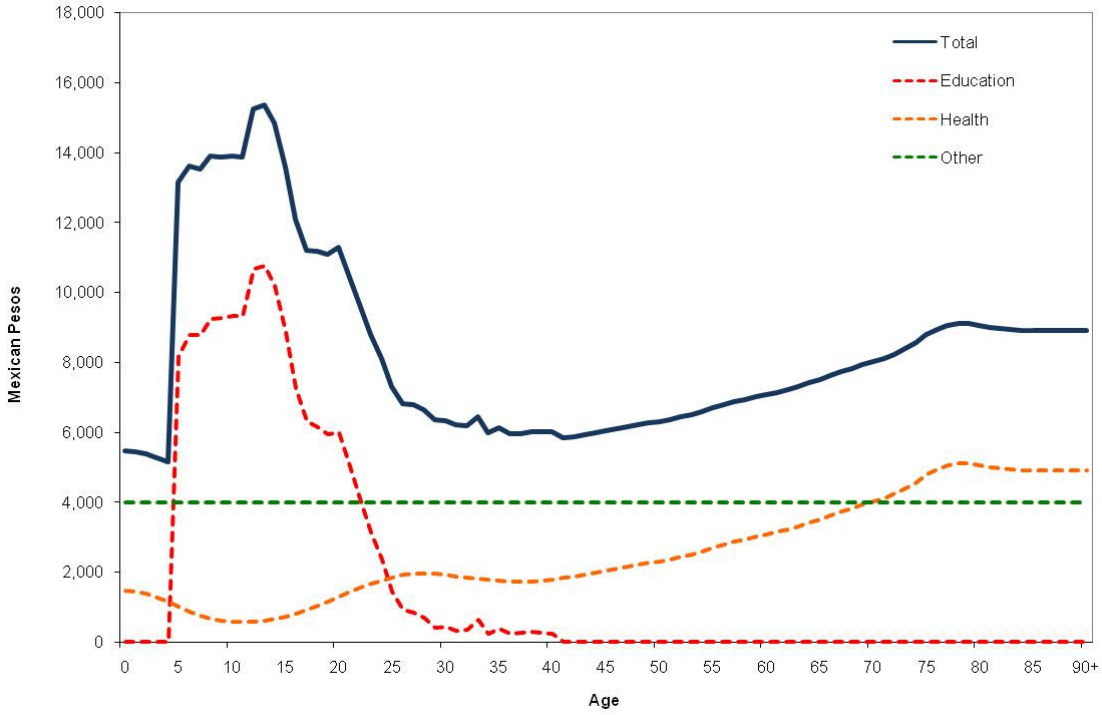


Figure 2. Per capita in-kind public transfers: Mexico, 2004

Cash transfers from the government to the public include public programs designed to alleviate poverty, such as the so-called *Oportunidades* and *Procampo* programs of the Ministry of Social Development. Data for the age allocation are from ENIGH-2004, which specifies the amount of resources that the families received from this type of program.

Public pensions include payments for workers in the private sector and the labor force employed by the public sector. Although the information in the survey does not allows to separate private from public pension benefits, the information reported was considered for the age allocation of this profile.

Public outflows include taxes and social security contributions. I used the Mexican government's fiscal rules in 2004 to construct the age profiles of public outflows.

*Taxes*

Income taxes (ISR) were the major tax in 2004, providing about 45 percent of the government's total fiscal revenues (SHCP 2008). They are assessed on individuals mostly through payroll taxes and on corporations (a category that includes self-employed individuals, earned interest, and property income) (SEGOB DOF 2009a). The age allocation of outflows from corporations was made proportional to the distribution of income from which this tax is obtained. The age allocation for individuals, however, was based on available estimates of the incidence of this tax by income deciles (SHCP 2008). See Mejía-Guevara (2009) for details.

Value-added tax (called IVA in Mexico) was the second major source of tax revenue in Mexico in 2004, contributing about 37 percent of the total fiscal income (SHCP 2008). I obtained the age allocation of this outflow source by considering the specific goods to which the tax is applied (SEGOB DOF 2007b) and using the same allocation methods as for the private consumption profiles. The estimation excludes merchandise sold in informal markets, representing a big source of fiscal evasion. It also takes into consideration the fact that the IVA rate structure varies according to geographic zone and type of merchandise. Four kinds of rates are considered accordingly: A zero-rate, a border-rate, a general-rate, and an exempt-rate. The rate of zero percent applies only for some commodities which are specified by the law (almost all types of food and medicines, for instance) (SEGOB DOF 2007b), a rate of 10 percent applies in frontier zones bordering the United States, Belize and Guatemala, the general-rate of 15 percent applies elsewhere in the country, and the exempt-rate represents an implicit rate between zero and general rates, which applies for some specific merchandise. I applied the corresponding rates to the appropriate zones and items but, in the case of the

exempt-rate, I applied a 7.5 percent IVA rate to be appropriate for the goods identified in the survey. The reason for doing this was that, although those items were not subject to this tax, the value added to the inputs used for their production implied the application of the tax. For the definition of frontier zones I used the approach that Tuirán and Ávila (2002) suggested for the north frontier border. Hernández-Trillo, and Zamudio-Carrillo (2004) used a similar approach to estimate the prevalence of IVA evasion in Mexico, taking nonmonetary as well as financial expenditures into account. In this paper I focus on the monetary case.

Excise taxes (IEPS) are levied on: tobacco, alcohol, and gasoline (SEGOB DOF 2007a). The three taxes considered thus far—IEPS, ISR, and IVA—account for more than 90 percent of the government's total tax revenues (SHCP 2008). To construct the age profiles of public outflows, I simply used a flat proportion of the consumption of goods identified in the ENIGH-2004 survey. I adjusted the level of consumption of those goods by removing the implicit IVA included in the expenditures reported by respondents. I assumed the same rate structure for the IEPS as for IVA for this adjustment. The age allocation relied on the same methods that were applied to private consumption profiles; that is, regression was applied to tobacco and alcohol, but an equivalence scale was applied to the use of gasoline.

Owing to a lack of information on Mexico's import tax in ENIGH-2004, I applied the age distribution of IVA to imports. I included several local taxes, such as a tax on new cars and a homeowners' tax. The age allocation was based on the sample information reported for those taxes. A tax on automobile ownership was included in the aggregate control, but not in the age distribution, because information about this tax was not available in the survey. These miscellaneous taxes amount to less than 10 percent of total fiscal revenues (SHCP 2008). Other miscellaneous current transfers and payments for non-life insurance claims were also included within this category.

*Social Security Contributions (SSC)*

To allocate social security contributions per individual, I applied to individuals the same distribution of income as was used for the ISR, namely income distribution by deciles. I followed the social security law (SEGOB DOF 2009b) to select income categories on which the contributions were levied.

Figure 3 presents the age profiles for taxes (ISR, VAT, IEPS and other) and social security contributions. I used information from government reports to adjust aggregate values for ISR, IVA, and IEPS, and from the UN Statistics Division (2008) to adjust the other taxes. The aggregate control for total outflows was from the UN Statistics Division's classification, for consistency with the rest of macroeconomic controls used in the analysis. By summing all the taxes and social security contributions, I obtained the general tax profile, an important concept for NTA estimation, since it is used in the definition of private intrahousehold transfers and for the distribution of public asset-based reallocations, as will be explained later. Figure 3 shows the per capita age structure of the general tax profile, where working age groups contribute in different ways but, being income taxes and social security contributions those that practically shape the profile. Taxes on consumption are the most important source of public outflows for children; whereas, elderly contribute via IVA, taxes on corporations, IEPS and other.

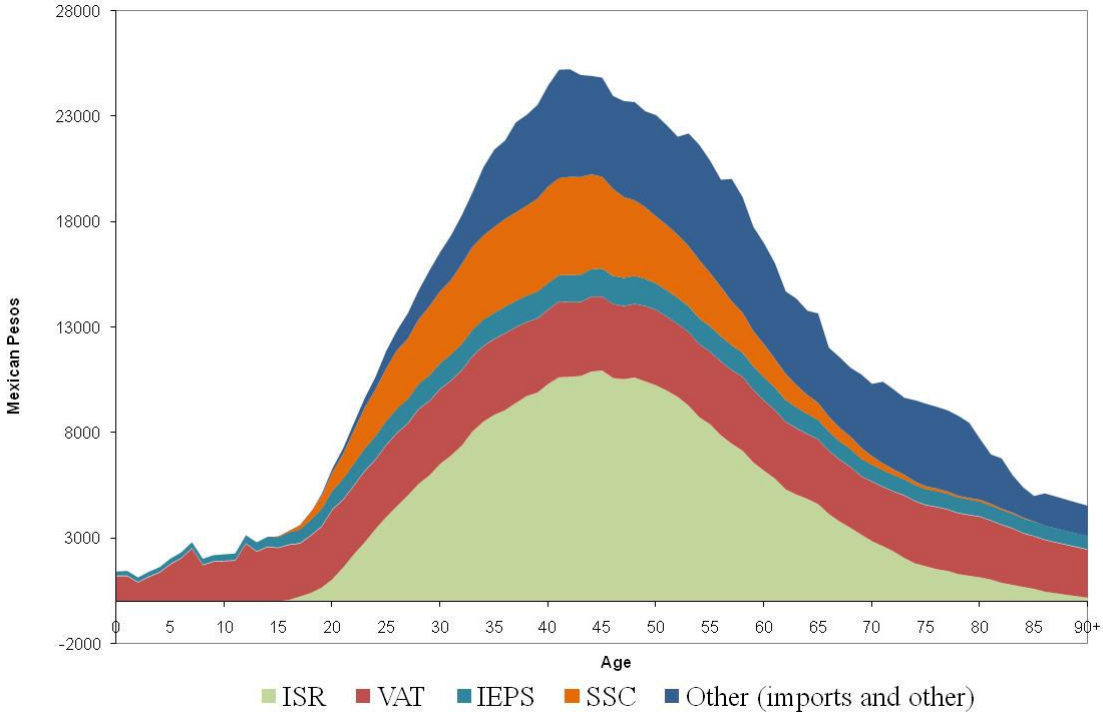


Figure 3. Mean public outflows (taxes and social security contributions): Mexico, 2004

*Net public transfers*

Figure 4 shows net public transfers (inflows less outflows) in 2004. Although children and the elderly received, on average, similar amounts of public transfers, the much larger number of young people in the population means that the amount of resources transferred to this group was substantially greater than the amount transferred to older people in aggregate terms. For example, the net transfers made to young people (between ages 0 and 19) were more than six times those made to the elderly (ages 65+). Much of the support for the young was in the form of public education.

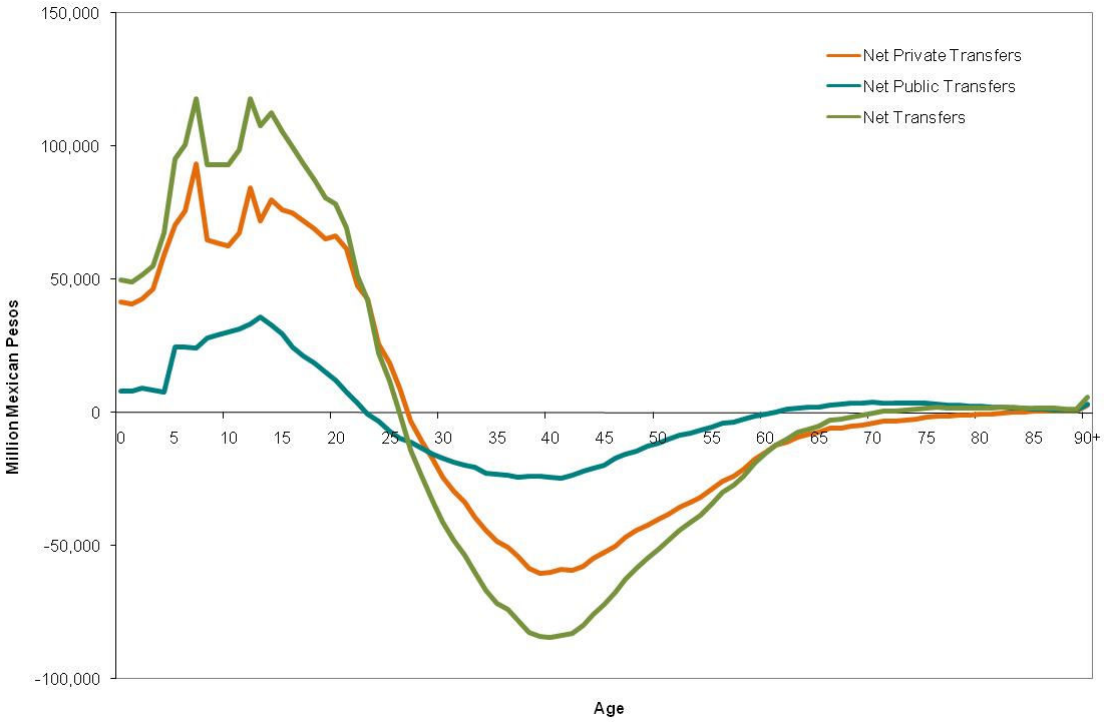


Figure 4. Aggregate public and private transfers: Mexico, 2004

**Familial transfers**

Virtually all private transfers in Mexico take place among family members, whether they are transfers within the same household, between households in Mexico, or between households separated by international borders. As indicated earlier, US dollars sent to Mexico as remittances play a major role in the Mexican economy.

*Interhousehold transfers*

I used information on gifts or transfers reported in ENIGH-2004 to construct profiles of transfers between households. The transfers are assumed to have taken place between household heads, as identified by survey respondents. The aggregate adjustment for net interhousehold transfers (inflows minus outflows) was performed by using information from the household survey, and the macro-level control for net current transfers from the rest of the world came from the System of National Accounts of Mexico (*Miscellaneous current*

*transfers* in the United Nations System of National Accounts classification). As residents of Mexico are net recipients of transfers from the rest of the world, interhousehold transfer inflows were adjusted to ensure that net private transfers from the rest of the world plus interhousehold transfer inflows equal interhousehold private transfer outflows (NTA 2009).

The fact that Mexico is a net recipient of transfers from the rest of the world is explained mainly by remittances, which amounted to US $18.3 billion in 2004.[2] They represent almost the total net current transfers from the rest of the world. To construct the age profile for those transfers I used responses to a question in ENIGH-2004 about money received from outside Mexico and took the net current transfers from the rest of the world as their macrocontrol by means of the UN System of National Accounts. The results indicate that people aged 20–49 received two thirds (68 percent) of all remittances and those 18–59 received 82 percent of the total.

*Intrahousehold transfers*

The NTA methodology was used to construct intrahousehold transfers. The profiles used for these transfers needed to be consistent with the micro-level information obtained from survey respondents. The age profiles, adjusted by means of macrocontrols, were based on a computation of disposable income in households as distributed among all members of the household. All possible sources for the construction of disposable income were considered: labor income, net public cash transfers, taxes and social security contributions paid, net interhousehold transfers, private education consumption, health care, other nondurable consumption, housing, and other durable consumption.

[2] Remittances represent about 2.5 percent of GDP according to own estimates based on aggregate controls and reports from the Central Bank of Mexico.

Compared with interhousehold transfers, intrahousehold transfers were much larger, accounting for nearly all net private transfers. For young ages, net private transfers were positive until age 26; afterward, they turned negative until age 83, when they became positive again (see Figure 4). For those of ages 0–26 the intrahousehold transfers represented 98 percent of the total, and for the age group 83+ they represented 30 percent of the total; but total net transfers for this latter group were negligible because few households had members of such advanced age. For ages 27–82 net interhousehold transfers were positive, whereas net intrahousehold were negative, but the proportion of interhousehold/intrahousehold transfers was only −10 percent, the negative sign of intrahousehold transfers being dominant. This result indicates that children and young adults receive substantial support not only from working-age family members, but also from the elderly.

**Net public and familial transfers**

As Figure 4 indicates, more resources are allocated to young people from private (familial) than from public transfers, but the contrary is the case for older people. For working age groups, familial transfers clearly dominate, representing the majority of net transfers.

Figure 5, which compares age profiles of per capita lifecycle deficit, net transfers, and asset-based reallocations, indicates how the deficit is supported for young and old people. Almost all the deficit for young people (ages 0–19) is covered through transfers, whereas for older age groups (60+), asset-based reallocations are the main source of sustaining them. In fact, asset-based reallocations indirectly support children, since the lifecycle surplus of parents is far too small to fund transfers to children. The population structure has a major effect on the magnitude of transfers because net total transfers to young people constitute 98.8 percent of their lifecycle deficit whereas for older groups their net contribution to the support of the lifecycle deficit is −11.1 percent, although the contribution of the public transfers is important for this group, which is 23.3 percent of the total. Asset-based

reallocations compensate for the fact that the net transfers for younger groups come from the working and elderly population.

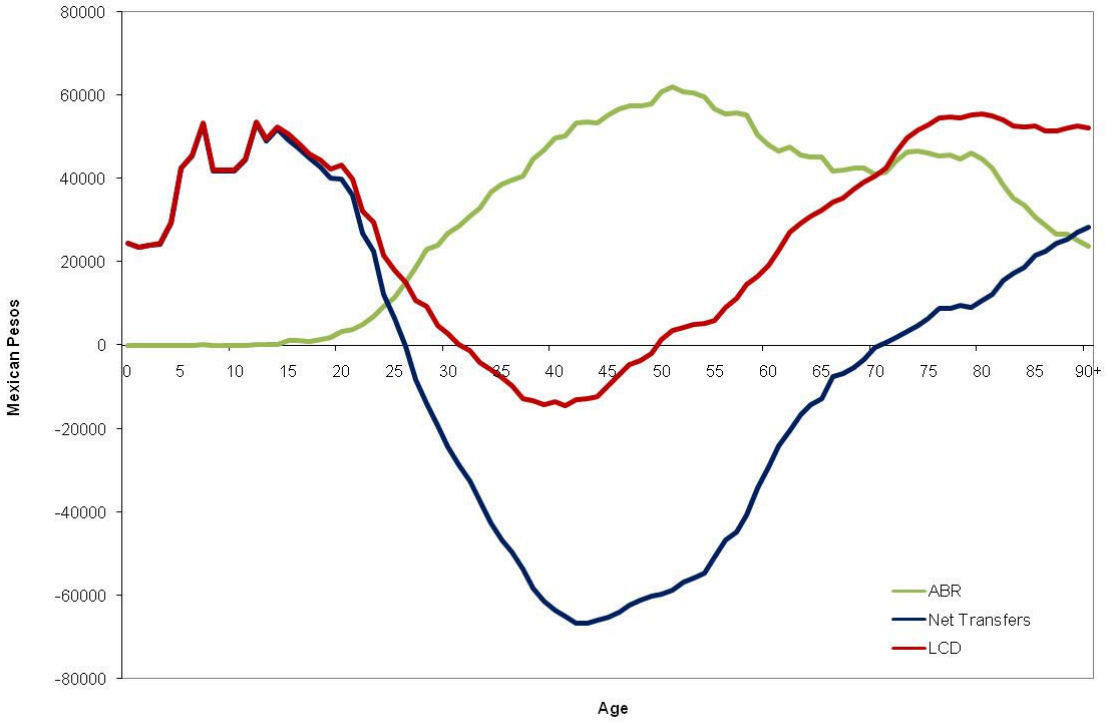


Figure 5. Per capita lifecycle deficit, net transfers, and asset-based reallocations: Mexico, 2004

*Asset-based reallocations*

Once the lifecycle deficit and net transfers are estimated, the computation of total asset-based reallocations is straightforward, calculated by means of the national transfer flow account identity (Mason et al. 2009). The computation enables the production of a so-called triangle graph (Figure 6), which illustrates the proportions by which asset-based reallocations and public and private transfers contribute to the support of the lifecycle deficit for those of ages 65+ in selected countries. The graph shows that, in Mexico, the majority of the total old-age lifecycle deficit can be supported via asset-based reallocations. Around one third of the total deficit could be sustained by public transfers; however private transfers from the elderly to younger age groups negatively contribute with one fifth of the total. That result reinforces the

finding that, overall, older people transfer resources to younger groups rather than vice versa, but the government compensate them via public transfers, basically by means of cash transfers and pensions. That is, 92.3 percent of the support for the lifecycle deficit comes from asset-based reallocations, whereas 7.7 percent comes from transfers. The last percentage is positive because the positive contribution of public transfers (27.7 percent) dominates the negative contribution of private ones (−20.0 percent).

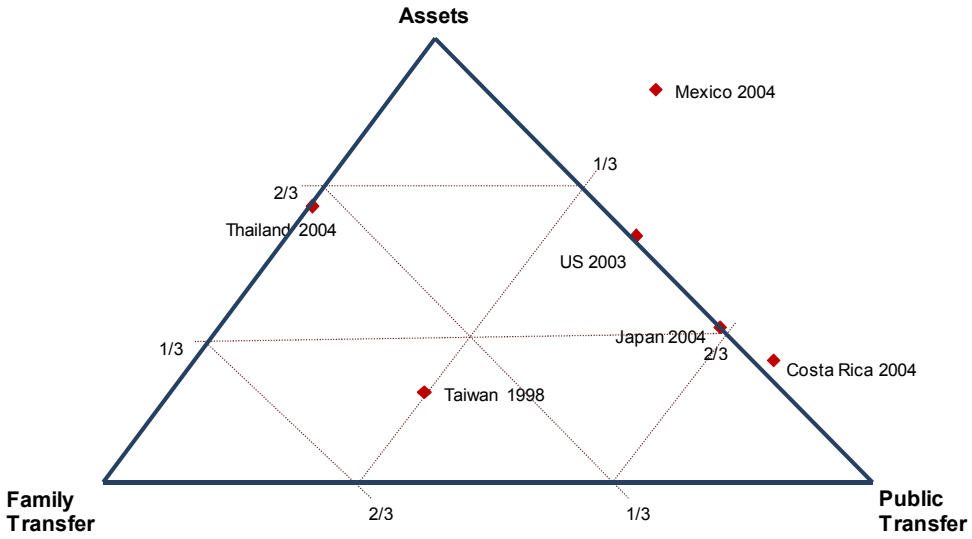


Figure 6. Composition of old-age lifecycle deficit: selected countries
Preliminary estimates for the other countries are from the National Transfer Accounts Project (NTA 2009). Selected countries: Costa Rica (Rosero-Bixby and Robles 2008), Japan (Ogawa et al 2008), Thailand (Chawla 2008), Taiwan and US (Mason et al. 2009).

Figure 6 also shows Mexico's reallocation system in relation to that for older people in other countries. For instance, in Costa Rica public transfers to the elderly are substantial, supporting more than two thirds of its deficit.

Another methodology developed by the NTA Project can be used to compute the components—public and private—of asset-based reallocations. I employed it to estimate age profiles for Mexico. For public reallocations the general tax profile was used to distribute public components proportionally. Those components are property income (including interests, distributed income from corporations, reinvested earnings on direct foreign

investment, property income assigned to insurance policyholders, and rent), capital income, and public saving. For private reallocations some profiles needed to be estimated; they were interests, property income, mixed income, and operating surplus. I constructed the age profiles using information from ENIGH-2004, considering the age of the household head when making the age allocation. I then distributed the components of private asset-based reallocations using those profiles. Private saving reallocation was obtained from residuals. Macrocontrols for public and private asset-based reallocations came from Mexico's System of National Accounts.

The treatment of oil revenues is a critical issue for Mexico since these resources represent about one third of the federal government's total revenues. PEMEX is obligated by law to transfer a large amount of its revenues from the extraction and commercialization of oil to the government. Those profits are transmitted through various mechanisms specified in the law. Some of them take the form of rights and royalties that constitute nearly all the operating surplus of PEMEX and that, in the end, are transferred in almost their entirety to the government (Mejía-Guevara 2009). These payments are classified as public property income inflows and as private property outflows—specifically as rent in both cases.

I allocated the private property income outflow by age, using the same age profile as the private capital inflow from the public enterprise. The public property inflows have the same age profile as the general tax profile. Details of this treatment can be found in Mejía-Guevara (2009).

Table 1 presents preliminary results of the national transfer flow account by three broader age groups. The estimations for the principal component elements of this account are displayed in aggregate terms. The main findings previously discussed for the lifecycle deficit and net transfers are supported on these data. In the case of asset-based reallocations it indicates that 84 percent of the total was concentrated on the group 20–59 and 15 percent in

the 60+ age group. In the public sector the distribution for young and old is different because the age group 0–19 contributed 10 percent, whereas the age group 60+ contributed 8 percent. The biggest share of net asset-based reallocations came from private sector, with around 95 percent of the total. The public sector's contribution was significant in only the 0–19 age group with 45 percent; for the other two age groups public participation was less than 5 percent. Finally, the contribution of oil revenues to public property represented 75 percent of total property inflows; but their contribution to private property outflows was lower (14 percent), though also substantial (not shown in Table 1).

Table 1. Aggregate lifecycle deficit and intergenerational redistribution: Mexico, 2004
(Values in billion Mexican pesos)

| Item | All ages | 0–19 | 20–59 | 60+ |
|---|---|---|---|---|
| Life cycle deficit | 2,350.2 | 1,803.9 | 249.1 | 297.2 |
| Consumption | 5,761.3 | 1,933.6 | 3,355.4 | 472.3 |
| Private | 4,847.3 | 1,438.3 | 2,997.8 | 411.2 |
| Public | 914.0 | 495.3 | 357.6 | 61.0 |
| Labor Income | 3,411.1 | 129.8 | 3,106.3 | 175.1 |
| Age Reallocations | 2,350.2 | 1,803.9 | 249.1 | 297.2 |
| Net transfers | 193.5 | 1,795.7 | -1,536.9 | -65.3 |
| Private | 193.6 | 1,323.9 | -1,027.4 | -102.9 |
| Public | -0.2 | 471.8 | -509.5 | 37.5 |
| Asset-based reallocations | 2,156.7 | 8.2 | 1,786.0 | 362.5 |
| Private | 2,057.2 | -1.4 | 1,703.7 | 354.8 |
| Income on Assets | 2,358.2 | 2.5 | 1,832.0 | 523.7 |
| Less: Private Saving | 301.0 | 3.9 | 128.2 | 168.8 |
| Public | 99.5 | 9.6 | 82.3 | 7.6 |
| Income on Assets | 307.7 | 29.7 | 254.4 | 23.6 |
| Less: Public Saving | 208.2 | 20.1 | 172.1 | 16.0 |

## Conclusions

NTA estimates for 2004 in Mexico reveal a large lifecycle deficit for the two dependent age groups and then only a modest surplus for the working age group. Moreover, the age range of the surplus was only from 32 to 49. This surplus span is possibly the lowest for NTA country members.

Support for the lifecycle deficit comes from high levels of per capita public transfers for children and the elderly. However, private (familial) transfers dominate net total transfers and are greater to the young than to the elderly. Intrahousehold transfers constitute the majority of private transfers. Asset reallocations clearly can support most of the entire old-age lifecycle deficit, since a big proportion of the three-quarters of public transfers that this group receives is nullified by the net familial transfers this group distributes to other age groups.

The results presented here were derived from a cross-sectional analysis and might be different for other years. It would be instructive to perform NTA estimations for other periods in order to make comparisons with longitudinal data and to incorporate additional aspects of the Mexican economy in the analysis. For instance, the analysis of pensions and the reforms of the social security system in Mexico deserve careful analysis.

**REFERENCES**

Chawla, Amonthep. 2008. Macroeconomic aspects of demographic changes and intergenerational transfers in Thailand. Ph.D. dissertation, Department of Economics, University of Hawaii at Manoa.

CONAPO [Consejo Nacional de Población]. 2008. *Proyecciones de la Población en México, 1950–2050* [Projections of the population of Mexico, 1950–2050]. www.conapo.gob.mx (accessed April 4th 2009).

Hernández-Trillo, F., and A. Zamudio-Carrillo. 2004. *Evasión fiscal en México: El caso del IVA* [Fiscal evasion in Mexico: The case of IVA]. Mexico City: Centro de Investigación y Docencia Económicas.

IMF [International Monetary Fund]. 2009. *World economic outlook database.* www.imf.org/external/ns/cs.aspx?id=28 (accessed April 4th 2009).

INEGI [Instituto Nacional de Estadística y Geografía]. 2006. *Sistema de cuentas nacionales de México: Cuentas por Sectores Institucionales 1999-2004 Tomo II* [System of national accounts of Mexico: Accounts for institutional sectors 1999-2004 Chapter II]. Mexico City.

———. 2008a. *Encuesta nacional de ingreso y gasto de los hogares 2004* [National survey of income and expense for homes, 2004] www.inegi.gob.mx (accessed June 20th 2008). .

———. 2008b. *Banco de Información Económica (BIE)*. www.dgcnesyp.inegi.org.mx/cgi-win/bdieintsi.exe (accessed June 20th 2008)

Lee, Ronald, Sang-Hyop Lee, and Andrew Mason. 2008. Charting the economic lifecycle. In A. Prskawetz, D. E. Bloom, and W. Lutz, (eds.), *Population aging, human capital accumulation, and productivity growth*. Population and Development Review 33(Suppl.). New York: Population Council. Also NBER Working Paper No. 12379.

Mason, Andrew, Ronald Lee, An-Chi Tung, Mun-Sim Lai, and Tim Miller. 2009. Population aging and intergenerational transfers: Introducing age into national accounts. In D. Wise (ed.), *Developments in the Economics of Aging*. Chicago: National Bureau of Economic Research and University of Chicago Press (forthcoming).

Mejía-Guevara, Iván. 2008. Ciclo de Vida Económico en México [Economic lifecycle in Mexico]. In F. Vélez Fernández-Varela (ed.), *La Situación Demográfica de México 2008*. Mexico City: Consejo Nacional de Población.

———. 2009. The role of public sector in the national transfer accounts of Mexico. Paper presented at the Sixth Meeting of the Working Group on Macroeconomic Aspects of Intergenerational Transfers, Berkeley, CA, 9–10 January 2009.

Mojarro, Octavio, and Iván Mejía-Guevara. 2005. Efecto de los cambios en la estructura por edades de la población sobre el ahorro y la inversión en México [The effect of the changes in the age

structure of the population on saving and investment in Mexico]. In E. Zúñiga-Herrera (ed.), *México ante los desafíos de desarrollo del Milenio* [Mexico before the challenges of development of the Millenium]. Mexico City: Consejo Nacional de Población.

NTA [National Transfer Accounts Project]. 2009. http//www.ntaccounts.org (accessed April 23th 2009).

Ogawa, Naohiro, Andrew Mason, Amonthep Chawla, and Rikiya Matsukura. 2008. Japan's unprecedented aging and changing intergenerational transfers. NTA Working Paper. East-West Center, Honolulu.

Rosero-Bixby, Luis, and Arodys Robles. 2008. *Los dividendos demográficos y la economía del ciclo vital en Costa Rica* [The demographic dividends and the economy of the lifecycle in Costa Rica]. Papeles de Población 55: 9–34.

SEGOB [Secretaría de Gobernación]. DOF [Diario Oficial de la Federación].2007a. *Ley del Impuesto Especial Sobre Producción y Servicios*. http://www.ordenjuridico.gob.mx/Federal/Combo/L-77.pdf (accessed May 2th 2009).

———. 2007b. *Ley del Impuesto al Valor Agregado*. http://www.ordenjuridico.gob.mx/Federal/Combo/L-76.pdf (accessed May 2th 2009).

———. 2009a. *Ley del Impuesto Sobre la Renta*. http://www.ordenjuridico.gob.mx/Federal/Combo/L-78.pdf (accessed May 2th 2009).

———. 2009b. *Ley del Seguro Social.* http://www.ordenjuridico.gob.mx/Federal/Combo/L-88.pdf (accessed May 2th 2009).

SHCP [Secretaría de Hacienda y Crédito Público]. 2007. *Criterios generales de política económica 2008* [General criteria of economic policy 2008]. Mexico City. www.shcp.gob.mx (accessed August 31st 2008).

———. 2008. *Cuenta de la Hacienda Pública Federal 2004* [Account of the Federal Public Funds]. Mexico City. www.shcp.gob.mx (accessed August 31st 2008).

Tuirán, Rodolfo, and José L. Ávila. 2002. *Delimitación de la franja fronteriza del norte de México* [Delimitation of the frontier border of the north of Mexico]. In E. Zúñiga-Herrera (ed.), *La situación demográfica de México 2002*. Mexico City: Consejo Nacional de Población.

UN (United Nations). ECLAC (Economic Commission for Latin America and the Caribbean). 2008. Demographic change and its influence on development in Latin America and the Caribbean. Report at 32nd session of the United Nations Economic Commission for Latin America and the Caribbean, Santo Domingo, Dominican Republic.

UN (United Nations). Statistics Division. 2008. About the system of national accounts 1993. http://unstats.un.org/unsd/sna1993/introduction.asp (accessed May 2nd 2009).

UN (United Nations). Population Division. 2009. World Population Prospects: The 2008 Revision. Population Database. http://esa.un.org/unpp/index.asp?panel=2 (accessed May 2nd 2009).