The economic lifecycle and intergenerational redistribution in Mexico

Iván Mejía-Guevara

In Mexico net transfers are the major 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 mostly via asset-based reallocations, since the negative effect of private transfers from the elderly to the younger population nullifies much of the positive support of public transfers. These are the conclusions drawn from an analysis of Mexico’s economic lifecycle deficit, based on the National Transfer Accounts (NTA) methodology and data from 2004. This chapter also examines the role of oil revenues within the intergenerational framework.

Mexico, a middle-income country, is in an advanced stage of demographic transition that is playing an important role in the society’s development, offering not only opportunities but challenges as well. This chapter uses the 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 were used to study the economic impact of Mexico’s demographic transition (Mojarro and Mejía Guevara 2005), but recently the NTA framework has been used for the same purpose (Mejía Guevara, Vélez Fernández-Varela, and García López 2009).

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

The next two sections of the chapter 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 it presents the principal results from the estimation of the NTA components for 2004, focusing on the most relevant elements of the components. It concludes with some observations about the implications of the findings.

**Mexico’s demographic transition**

According to the United Nations (UN ECLAC 2008), Mexico is one of seven Latin American countries that are undergoing an advanced phase of the demographic transition. The main characteristic of this stage is the achievement of both low fertility and low mortality rates. Partida (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 decades earlier, reveal how rapid Mexico’s transition has been. 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 (Partida 2008).

Mexico’s estimated population in 2008 was 106.7 million, or 8.2 million (8.4%) more than in 2000 (Partida 2008). The estimated age composition of the population in that year—29.3% in the 0–14 age group, 65.0% in the 15–64 age group, and 5.6% in the 65+ age group
—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 16.8%, 61.9%, and 21.2%, respectively. In other words, although the total population will increase by 14%, the young age group will shrink in relative terms by 35%, whereas the 65+ age group will more than quadruple. Meanwhile, the working-age group is expected to increase by only 9%.

The economy

Mexico’s per capita GDP in 2007 was approximately USD $14,133 PPP the highest per capita GDP among the NTA Latin American country members. Its estimated per capita GDP for 2009, $13,628, was projected to be less than that of Chile, however (IMF 2010).

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 USD $110,920.2 million, averaging about 2.8% 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 USD $23,053.7 million, or 2.7% 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 2008), I estimated national transfer accounts for Mexico in 2004. The main source of information at the microlevel 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, fringe benefits, or entrepreneurial income profiles, the components of YL. Following Mejia 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 8 to age 41, when it reaches its maximum level. The rate of growth is highest between ages 8 and 24. After age 41 earnings decline almost consistently but moderately until age 61, after which the decline is more rapid. Earnings drop lower than entrepreneurial income after age 63. In the absence of data, I assume that fringe benefits are a constant proportion of wages and salaries.

Entrepreneurial income is evident from age 11, 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 47, 6 years after the earnings profile peaks. The decline among entrepreneurs after age 48 is slower than that observed for the earnings profile and is reflected in the slow decline of the total labor income. Many people continue working after the official retirement age of 65, or 60 in the case of severance (SEGOB DOF 2009), 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% 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 for all subsequent ages, with small variations at the oldest ages.

The average period during which labor income exceeds consumption, is only 16 years, which is probably the shortest period among NTA country members. It begins at age 33 and ends at age 48. In aggregate terms, the lifecycle deficit for young people is much greater than it is for older groups, among whom it is only 14.6% of the total. As Figure 1 shows, however, the per capita deficit is very similar for both groups. The total deficit is also much greater than the surplus for those of ages 33–48, the surplus being only about 6.6% of the deficit in absolute terms. Therefore, working age groups could support only about 45.1% of the deficit of older groups with their labor income. However, 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 consumption to labor income is around 1.7 (estimate based on macrocontrols). A surplus period of 22 years was reported in Mejía Guevara (2008), but the difference can be explained by the government’s treatment of oil revenues, discussed below.

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

**Public transfers**

Using the NTA methodology, I divided public transfers into inflows and outflows, treating in-kind and cash 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 defense). 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. Details about the estimation of the profiles can be found in Mejía Guevara (2008).

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 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 were the major tax in 2004, providing about 45% of the government’s total fiscal revenues (SHCP 2008). They are assessed on individuals mostly through payroll taxes and on corporations, a category that also includes self-employed individuals, earned interest, and property income. The age allocation of income taxes was made proportional to the distribution of income from which this tax is obtained.

Value-added tax (VAT) was the second major source of tax revenue in Mexico in 2004, contributing about 37% 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, which do not contribute to this tax and thus represent a big source of fiscal evasion. The estimation also takes into consideration the fact that the VAT rate structure varies according to geographic
zone and type of merchandise. Four rates are considered accordingly: a “zero” rate, a “frontier” rate, a “general” rate, and an “exempt” rate. The rate of 0% applies only to merchandise specified by the law, such as nearly all types of food and medicines (SEGOB DOF 2007b); a rate of 10% applies in frontier zones bordering the United States, Belize, and Guatemala; the general rate of 15% applies elsewhere in the country; and the exempt rate is an implicit rate ranging between zero and the general rate, which applies to specific merchandise. I applied the first three rates to the appropriate zones and items. In the case of the exempt rate I applied a 7.5% IVA rate for the goods identified in the survey because, although those items were not subject to this tax, the value added to the inputs used for their production implied its application.

Excise taxes are levied on: tobacco, alcohol, and gasoline (SEGOB DOF 2007a). The three taxes considered thus far—excise, income, and value-added—account for more than 90% 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 VAT included in the expenditures reported by respondents. I assumed the same rate structure for the excise tax as for VAT in making the 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 VAT 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% of total fiscal revenues (SHCP 2008).
Social security contributions

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

I used information from government reports to adjust aggregate values for income, VAT, and excise taxes, 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. The aggregate control incorporates other current transfers, which are allocated by age as a constant proportion of other taxes. By summing all the taxes, social security contributions, and other current transfers, 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.

Net public transfers

Figure 2 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 positive transfers made to young people (between ages 0 and 19) were 4 times those made to the elderly (ages 65+). Much of the support for the young was in the form of public education.

[Figure 2 about here]
Familial transfers

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

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 macrolevel adjustment for net interhousehold transfers (inflows minus outflows) was performed by using information from the household survey, and the macrolevel 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 equaled interhousehold private transfer outflows (NTA 2008).

The fact that Mexico is a net recipient of transfers from the rest of the world is explained mainly by remittances, which amounted to USD $18.3 billion in 2004. 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 the macrolevel by means of the UN System of National Accounts. The results indicate that people aged 20–49 received 73% of all remittances and those 20–59 received 83% of the total.
Intrahousehold transfers

I used NTA methodology to construct intrahousehold transfers. The profiles used for these transfers needed to be consistent with the microlevel 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.

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 85, when they became positive again (see Figure 2). For those of ages 0–26 the intrahousehold transfers represented 96% of the total, and for the age group 85+ they represented 40% of the total; but total net transfers for this latter group were negligible because few households had members of such advanced age. For ages 27–84 net interhousehold transfers were positive, whereas net intrahousehold were negative, but the proportion of interhousehold/intrahousehold transfers was only −9%, 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 2 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 ages, familial transfers clearly dominate, representing the majority of net transfers.
Figure 3, 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 97% of their lifecycle deficit whereas for older groups their net contribution to the support of the lifecycle deficit is 11%. Asset-based reallocations compensate for the fact that the net transfers for younger groups come from the working and elderly population.

[Figure 3 about here]

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 proportions by which asset-based reallocations and public and private transfers contribute to the support of the lifecycle deficit for those of ages 65+ are an important research question. In Mexico the total old-age lifecycle deficit can be supported mostly by asset-based reallocations. Almost two fifths of the total deficit could be sustained by public transfers, but private transfers from the elderly to younger age groups annul a big portion of this positive fraction. That result reinforces the finding that, overall, older people transfer significant resources to younger groups and vice versa; although, the net effect is positive for elderly. That is, 89% of the support for the lifecycle deficit comes from asset-based reallocations, whereas 11% comes from transfers. The last percentage is positive because the positive contribution of public transfers (37%) dominates the negative contribution of private ones (−26%).
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 I used the general tax profile 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. 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.

With regard to asset-based reallocations, I found that 83% of the total were concentrated on the group 20–59 and 15% in the 60+ age group. In the public sector the distribution for young and old is different because ages 0–19 contributed 15%, whereas ages 60+ contributed 5%. The biggest share, almost 95%, of net asset-based reallocations came from the private sector. Finally, the contribution of oil revenues to public property
represented 75% of total property inflows; but their contribution to private property outflows was lower (14%), though also substantial.

**Conclusions**

NTA estimates for 2004 in Mexico reveal a large lifecycle deficit for the two dependent age groups and only a modest surplus for the working age group. Moreover, the surplus was found only among ages 33–48, possibly the narrowest surplus span 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 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 can support most of the old-age deficit, since a big proportion of the positive public transfers that this group receives is nullified by the net familial transfers that elders distribute to the 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 for comparison and to incorporate additional aspects of the Mexican economy in the analysis. For instance, the treatment of pensions and the reforms of the social security system in Mexico deserve careful analysis.

**References**


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

During 1970–75, the TFR was 6.5, the 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).

Remittances represent about 2.5% of GDP according to my estimates based on aggregate controls and reports from the Central Bank of Mexico.