Intergenerational reallocations in Chile 1987-1997

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1. Background

Chile is a middle-income country with a highly urbanized, aging population. Its economy has been scrutinized by scholars and policy analysts interested in the country’s structural adjustment programs, reforms and policies. Considerable attention has been given for example, to the effect of economic policies on macro stability and growth, to the effects of the privatization of the pension system on aggregate saving and economic growth, and to the distributional effects of public expenditure and specific transfer programs. Demographers and some government entities have discussed the potential economic consequences of population aging, particularly the implications for financing of the pension and health systems, and public education programs directed to children and youth. But little systematic research has been carried out linking specifically demographic trends, including the age composition of the population to economic variables or outcomes.

This paper makes a contribution in this regard by examining the production and consumption profiles over the lifecycle, the extent of economic dependency and the means of financing consumption in different stages of life. We also consider and some of the effects that inter-age resource reallocations have on different generational groups of the Chilean population. The analysis is based on new estimates, the first available to date, of Chilean national transfer accounts (NTAs). As we will see in the following sections, these accounts allow for a systematic and detailed study of some important aspects of the economic lifecycle.

1. a) Economic setting

The Chilean economy and the living standards of the population have changed significantly over the last few decades. The country ranks high within the Latin American region in many socioeconomic indicators, including a per capita income of about US$ 12,700 PPP in 2006, the second highest value in Latin America after that of Argentina (IMF, 2007). Annual growth of per capita GDP accelerated from of little over 2% during the 1980s to 5% during the 1990s (Loayza and Soto, 2002). Per capita economic growth decelerated somewhat since, but despite short-term variations, averaged a healthy 3.2% per year during the first half of 2000s. Over the past decade and a half, Chile has maintained a reasonably stable macro economy and sustainable external accounts. The government introduced in 2000 a fiscal rule of “structural balance” (Marcel et.al. 2001) whereby spending is set in accordance to the estimated medium-term trend in GNP, which produces stabilizing, counter-cyclical effects.1

One of the engines of aggregate growth has been capital accumulation, made possible by national saving. During the 1960s and 1970s, the national saving rate of Chile fluctuated significantly, and averaged only about 12% of GDP (Bennet, Schmidt-Hebbel and Soto, 1999). After the economic crisis of 1982-83, a decade in which ageing of the population structure started to become noticeable, savings increased sharply, to over 20% of GDP at the end of the 1980s, remaining at about those levels during the 1990s. By 1997, the main year examined in this paper, savings were 23.1% of GDP while

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1 Fiscal discipline has also contributed to greatly reduce the public and external debt, resulting in record low country risk premia (Marcel, 2006)
investment was 27.7% of GDP. This performance is better than average within Latin America, although it lags considerably behind that of a number of countries of Asia.

Another area in which the country has made substantial progress is poverty, which used to be very high during the 1980s, the last decade of the military government, reaching 45% of the population in 1987. The incidence of poverty, as well as unemployment and salaries, were directly and sometimes severely affected by short-term macroeconomic cycles. That trend changed course starting the 1990s with the return to democracy. Poverty rates have fallen sharply since, from 38.6% of the population in 1990 to 13.7% in 2006, while the rates of extreme poverty have fallen from 13.0% in 1990 to 3.2% in 2006, both well below the average of Latin American countries (ECLAC, 2007). This systematic improvement was made possible by fairly sustained macro growth, and the relative insulation of poverty from the short-term fluctuations as a result of the aforementioned governmental policy of “structural balance” as well as targeted social policies, including public transfers specifically geared toward poverty reduction (Leiva, 2006). Nonetheless, as we will indicate below, there is surely room for further improvement, in particular as regards as the worrisome age distribution of poverty, which is still concentrated in young children.

Two dimensions of socio-economic development have been more resistant to long-term improvement. One is unemployment, which has remained over 8% of the workforce in recent years in spite of the favourable macro trends just described, the counter-cyclical fiscal policy, and specific government-supported employment programs. The other is income inequality, as measured by the Gini coefficient (or other indicators such as the ratio of income of the richest to the poorest population groups). Thus measured, inequality increased somewhat from the 1970s to the late 1980s when it reached a Gini of nearly 0.6, and then declined during the 1990s to attain in 2003 a value near 0.55, comparable to the inequality levels of the late 1960s (Larrañaga, 1999, Ministry of Finance, 2005, ECLAC, 2006). Government social expenditures and public transfer programs in particular, appear to make a significant contribution to lessening inequality (MIDEPLAN, 2006), but some of the inertial structural conditions that affect the income distribution have proved hard to overcome.

1. b) Demographic characteristics and trends

The population of Chile, which today stands at 16.8 million, is undergoing a significant demographic transition. The first half of the XXth century featured a total fertility rate of over 6 children per women and life expectancy at birth under 55 years. The elderly (those aged 65 or older) constituted a small group of the population, and relatively few survived to ages much older than the normal retirement age: less than 40% survived to the age of 70 and less than 20% to the age of 80. As in all pre-transitional societies, the main demographic-economic burden was on the maintenance of children, with old-age dependency being a relatively low risk for individuals and a concern of modest aggregate dimensions for the nascent social protection systems.

At the beginning of the 1980s, a decade when important reforms were introduced to the pension system and to the health and education sectors, fertility had dropped to near 2.5 children per woman and life expectancy had surpassed the 70 year mark. In more recent years, important policy changes have been introduced in the health sector, and more recently (in 2007) a new reform of the pension system. Significant changes to
The education system have been introduced recently which increased government subsidies for the primary and secondary levels, and more changes to the system will probably follow. All this occurs at a time when the demographic transition has advanced to below-replacement fertility of about 1.9 births per women in 2006, and to a life expectancy of 78 years (both sexes combined), a level comparable to that of some developed countries, such as the United States.\footnote{In the Latin American context, Chilean life expectancy ranks highest together with Costa Rica (followed closely by Cuba, with $e_0$ near 77 years), and fertility is second lowest, after Cuba’s very low 1.6 children per woman.}

These changes are producing significant demographic ageing, and imply that an increasing fraction of the lifecycle of individuals is spent in retirement: men surviving to age 60 can expect, on average, to live more than 20 additional years, and women more than 24 additional years. These numbers will continue to rise as the general trend toward ageing is projected to accelerate over the coming decades. Demographic ageing has converse expressions in the number of children, whose proportion in the population has decreased continuously since the 1960s, and have started to decrease even in absolute terms during the last few years. Viewed in their entirety, the current and projected changes in the population age structure translate into a demographic dependency ratio that is still low and falling, but which is expected to reverse trend in less than 10 years, when it is projected to reach its historical lowest level of 45.5 persons in the conventionally dependent ages (younger than 15 years and 65 years or older) per 100 persons in the main productive ages (between 15 and 64 years). This is an indication that there is little time left to reap the full benefits of the “demographic dividend” associated to a low demographic pressure on the consumption and distribution of the national production.

The economic and demographic patterns and trends just summarized have direct implications on inter-age transfers and the different ways in which individuals, families and the public sector reallocate production and economic resources to satisfy the consumption needs of the population in different stages of their lifecycle.

2. National Transfer Accounts for Chile, 1997

We examine next the “National Transfer Accounts” (NTA) of Chile, following the methodology developed by Andrew Mason, Ronald Lee and others (2005), which has been adopted for international comparisons, in particular among countries participating in the international NTA research project (http://www.ntaccounts.org). The results refer to the years 1987 and 1997 and include the life-cycle deficit, public and private transfers and, for 1997, also asset reallocations; that is to say, all the modules of the accounts.

Intergenerational reallocations represent different ways in which the difference between consumption and production at each age (i.e., the life cycle deficit) can be financed or, when production exceeds consumption, be transferred to people of other ages.

In this framework, the inflows to individuals of any given age originate in their labour income ($Y_l$), income from assets $A$ ($Y_A$), transfer inflows from the public sector ($\tau_g$) and from the private sector ($\tau_f$). The outflows consist of the individual’s consumption ($C$), investment ($I$) in capital, credit and land, which in the aggregate must equal savings, $S$. They also include transfer outflows to the government ($\tau_g$) and to the private sector.
(τ_j). A useful summary equation of the accounting framework is given by the following equation that expresses the life-cycle deficit in terms of its component parts:

\[
\begin{align*}
\text{Life-cycle deficit} & = \frac{C - Y_j}{A} + Y_A - S + \frac{\tau^+_g - \tau^-_g}{\text{Net public transfers}} + \frac{\tau^+_s - \tau^-_s}{\text{Net private transfers}} \\
& + \frac{\tau^-_f}{\text{Age reallocations}}
\end{align*}
\]

The equation says that, for any individual or collection of individuals of a given age, the lifecycle deficit must be matched (or be financed) by inter-age reallocations consisting of asset-based reallocations and net private and public transfers. In the following sections, we will explain briefly the concepts and measures of each of the main components; methodological details are given in the NTA website (http://www.ntaccounts.org).

For Chile, two key micro-level databases for the years 1987 and 1997 estimates are the national Budget and Expenditures (BES) of 1987 and 1996/97, and the socioeconomic characterization surveys (CASEN) of 1987 and 1998. The BES is the main data source for the estimation of private consumption, as it reports in great detail on 726 categories of expenditures on goods and services in the household. Although both surveys contain information for each individual household member on their sources of income (labour income, income from assets, transfers), we prefer the CASEN survey for the estimation of labour income, because it contains greater detail of the categories of income (43 in all, against only 5 types in the BES) and because the individuals are classified in single ages (in the BES in 1997 they were categorized in 5-year age groups). The CASEN survey is also the official source for the statistics and analysis of income distribution, and the best available for analyzing the impact of government transfer programs on living conditions of the population, especially low income groups (MIDEPLAN, 2008).

We also use the aggregate figures of public expenditures by programs reported annually by the Budget Directorate of the Finance Ministry (http://www.dipres.cl/fr_estadisticas.html), and on the age profiles of income taxes provided by the National Tax Service (Spanish acronym SII), which together allow for the estimation of net public transfers. All the age profiles were scaled to match the relevant aggregates of the National and Income Accounts (NIPA), published on the Chilean Central Bank (http://www.bcentral.cl/esp/publ/estad/aeg/aeg15.htm).

2. a) Lifecycle deficit

Figure 1 displays the lifecycle deficit for Chile in 1997. The curve of per capita labour earnings (dark purple line) has the characteristic inverted U-shape although it declines rather slowly with age, displaying values somewhat above the average of NTA countries at the older ages. This general age pattern is similar to that of the less developed countries (with NTA estimates), with one major difference: labour earnings peak at age 46 in Chile, about 5 years later than the average of the less developed NTA countries.3

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3 In fact, the Chilean peak matches more closely that of the more developed countries, but labour earnings in Chile fall off much more gradually thereafter, and remain more significant into the older ages.
This result is partly due to the significant income from self-employment (dashed light blue line) of Chilean older workers, which represents up to one-fourth of their per capita labour income. We will discuss labour earnings profiles in more detail in section 3.

In accordance with international evidence, wages from employed work is the main component of labour income for most of the lifecycle, especially in the younger ages. In effect, the overall Chilean age pattern of labour income is similar to that of Taiwan, which in this particular regard is closer to what is observed in the more developed countries.

The per capita consumption profile (thick blue line) has a slightly humped shape, commonly observed in developing countries. The age pattern is dominated by private consumption (dashed yellow line), which represents 83% of total consumption. Public consumption, i.e., the value of the goods and services provided in-kind by the government, accounts for the other 17%. This is a value that falls in between the lowest registered to date in NTA developing countries such as those of Indonesia and Thailand, and the much higher values observed in developed countries such as Japan, Sweden and the United States. Compared with other Latin American countries, the Chilean shape of the total consumption curve is similar to that of Costa Rica and Uruguay, but differs somewhat from Brazil, which shows relatively high values at the older ages.

Public consumption (dashed pink line) has a dampened double-hump shape (more details in section 2.b), but the slightly larger per capita values at the older ages are not high enough to overturn the slope of the curve of total consumption upward, as it occurs

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4 We discuss in detail the different components of the lifecycle deficit, including of course private consumption, in Bravo and Holz (2007).
in today’s more developed countries with very large government expenditures in health and other social services for the elderly. In Chile, those public programs are also significant, but these data show that, perhaps as a result of the privatization reforms in the social security and health systems initiated in the 1980s, the elderly receive relatively less (in-kind) public services and rely more on their own labour earnings, cash public transfers (pensions), asset income and, in some cases, on private transfers provided mostly by their children. We will return to these issues in the latter sections of this chapter (sections 2.c and 2.e).

Another interesting aspect of the results on the lifecycle deficit is the ages at which individuals become net producers and net consumers. In Chile in 1997, we find that the first transition occurs at about age 26, and the second one at age 54; thus the mean period of net production is about 28 years, somewhat below the average of NTA countries, but well in line with the mean net production period of the Latin American countries.

Finally, we must note that although those younger than age 26 and older than 54 are “dependents” from the point of view of the lifecycle deficit (individuals in both groups produce less than what they consume), there are evident differences in their economic status, the nature and degree of economic dependency. First, unlike younger dependents, older dependents finance one-fifth of their consumption with their labour income, and another fifth with asset income, and thus rely to a much lesser extent on transfers as a source of support. As will be documented below, the public/private transfer mix is also very different across the different ages. Second, it can be argued that the public transfers that older adults receive can reasonably be considered a “pay-back” of the taxes they paid while economically productive, as in an implicit intergenerational social contract. In the case of children, this interpretation is much less clear.

2. b) Public Transfers

In the NTA framework, public transfers are inflows to individuals and refer to all government current expenditures, not only to specific cash programs, as generally understood in the public finance usage of the term. The concept is that the activities and associated spending of the public sector produce goods and services that are of direct or indirect benefit to the population. Some of these benefits accrue only to specific groups (e.g., spending in education, pensions, poverty programs, etc.) while others accrue to the population at large, such as public infrastructure, foreign relations, general government operational costs. The former are assigned to the pertinent population groups, while the latter are allocated on a uniform per capita basis to all age groups. Public transfer outflows refer to the payments (taxes and social security contributions) that individuals make to the government within a given year.

The NTA Public transfer inflows are also categorized as cash or in-kind, and by some social sectors; i.e., health, education, social security, and other. Under the method’s definitions, the ensemble of public transfer inflows equals public expenditure. Public transfer outflows consist of direct and indirect taxes, which refer to income and property taxes on the one hand, and consumption and excise taxes on the other.

2.b.1) Public inflows (expenditures)
In 1997, aggregate public *in-kind* transfers represented 11% of GDP, more than half of which (6% of GDP) was consumption of collective goods; the remaining 5% was accounted for by health and education programs. *Cash* transfers represented 4.8% of GDP, virtually all of which is accounted for by public pensions, together with a small proportion of spending in training and unemployment subsidies.

The next figure shows the components of in-kind public transfers, which are clearly concentrated in children and adolescents (mostly education expenditures, blue line), and public health programs for the elderly (pink line). Other in-kind transfers (yellow line) constitute an important part of total in-kind transfers, but do not affect the shape of the curve, as they are distributed uniformly by age.

![Figure 2. Per-Capita in Kind Transfers, Chile 1997](image)

Compared to other countries in the NTA project, Chile has public education and health transfers that are in an intermediate range, close to other developing countries such as Costa Rica and Taiwan, well above Indonesia, but much lower than developed countries such as Japan and the U.S. As expected and commonly observed in other countries, education expenditures are high for children, teenagers and young adults, while health expenditures benefit young children and, mainly, older adults (Bravo, 2007). Other public consumption expenditures have no clear correlation with age.

In the case of Chile, *cash transfers* consist basically of old age and survivor’s pensions geared mostly to the elderly, which constitute the lion’s share of the public transfers to this age group, as seen in figure 3.
This figure also shows that per capita public benefits for the elderly dwarf those received by children, but because the population age structure is still heavily tilted toward the younger ages, the total public expenditure in children and the elderly are of comparable aggregate magnitude (Bravo 2006).

From the point of view of the income distribution, it is interesting to ask about the incidence of these transfers on different age groups. In previous research (Bravo, 2007) we assessed, for several Latin American countries, the impact of government cash transfers on poverty rates by age, drawing from a procedure devised by Uthoff and Ruedi (2002). The previous studies found, and these results confirm, that cash transfer programs have a sizeable redistributive impact, although not always in an intended or desirable way: while many of the in-kind public transfer programs (health, education, housing, etc.) are mildly progressive, the major cash transfer program in most Latin American countries, social security, is regressive, only slightly less so than the primary income distribution. On the other hand, welfare programs, including conditional cash transfers, are much more progressive despite some leakage into higher-income groups ECLAC, 2007).

In figure 4, we display the estimates obtained in the same manner as in our previous work on cash transfers, in this instance for Chile 1998.
These results confirm our previous finding for Chile, also observed in varying degrees in Brazil, Mexico and El Salvador that the poverty-reducing effect of cash transfers is much greater for the elderly than for other age groups. Even though not negligible for younger adults and children, government cash transfers directed to these ages groups are nonetheless insufficient to impede that children end up with higher poverty rates than the other generational groups. This should be a cause of concern from the point of view of inter-generational equity, and from an inter-temporal economic perspective, to the extent that it can be read as a sign of under-investment in the younger generations, i.e., future productivity. In this context, the expansion of public education programs over the last decade and a half and the recently inaugurated government program emphasizing the well being and social protection of all children (MIDEPLAN, 2007), appear to be well targeted.

It must be noted, however, that cash transfers represent only one third of all public transfers, and that other components of government expenditure are targeted to young, adult and older generations (e.g., spending in education, health, housing, social welfare). A comprehensive assessment of the distributional effects of transfers should thus consider cash and in-kind transfers (ECLAC, 2007) as well as public transfer outflows (see next section), to provide a comprehensive view of the net generational impact of public policies. The series of NTAs that we are constructing will provide the basic data with which these more detailed, complete evaluations of incidence can be made.  

2.b.2) Public outflows (taxes)

The tax structure of Chile, as in many other Latin American and developing countries, is heavily concentrated in indirect taxes (they represent 64% of tax proceeds), and imply

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5 Ideally, one would also like to examine the incidence inter-temporally, allowing for a true generational analysis. This requires a long series of NTAs, which are not yet available for Chile (see Bommier and others, 2004, for an interesting analysis of long time series for the U.S. and France).
an age profile of public outflows different from the developed countries, where direct taxes on income and assets play a much more important role. Figure 5 shows the main results, where it can be seen that income (direct) taxes have a younger age profile than the indirect taxes, whose shape is to a large extent determined by the flat added-value (consumption) taxes.

Figure 5. Per-capita Public Outflows, Chile 1997

Considering now the ensemble of public transfers inflows and outflows, Figure 6 summarizes the results of net aggregate public transfers, which are especially relevant from the point of view of public finance and generational accounts, inasmuch as they reflect the total, net amounts transferred by the government by age, that is to say, the total benefits received from the government minus the taxes paid by the population in each age group.
Individuals under the age of 20 and those over 60 receive net public inflows from the government, while those between those ages pay more in taxes than the value of benefits they receive, especially and more intensely individuals between their mid thirties and early fifties. Note that, unlike the image projected by per capita public inflows, the elderly receive slightly less net aggregate transfers as those received children and teenagers. This could well change, even in the near future, as the recent reforms of the social security system are implemented and the Chilean population continues to age.

2. c) Private transfers

Transfers that take place amongst private individuals without the mediation of the government (i.e., “private transfers”) are for the most part intra-household, but can also be inter-household. Unfortunately, in the case of Chile, the household surveys ask only about transfers received, but has no information on the amounts given or on who are the givers of the transfers received. Thus even though we have the information of transfer receipt for each individual household member, in order to estimate net private inter-household transfers we had to use special assumptions about the givers vis-à-vis the receivers. We considered two basic possibilities: (1) following the standard methodology of the NTA project, all private transfers are assumed to take place only amongst household heads; alternatively, (2) the recipient is that person identified in the survey as such, and the givers are assumed to be the household heads only. In both cases, we assume giving is proportional to household total factor (“autonomous”) income.

The results for inter-household transfers in both cases are of course different. Under the first assumption, the young and the old receive a very small portion of net transfers while individuals of intermediate adult ages are large net givers. This reflects the assumption made, since most household heads are indeed middle-age adults. Under the second assumption, net inter-household transfers (results not shown here) are more evenly spread out over the age span. In any case, since inter-household transfers represent only 16% of private transfers, adopting one assumption or the other does not have a large effect on the estimated total net private transfers.
Figure 7 shows the estimates of private transfers using the standard assumptions to estimate the inter and intra-household components. Not surprisingly, the results show that the main net receivers of private transfers are children, teenagers and young adults. To a much lesser degree, the elderly above the age of 75 are also net receivers. This last result is interesting, as it does not conform to the common view that the elderly are heavily dependent on familial transfers and financial support.

Another noteworthy feature of this figure is that, for all ages above 16, individuals are both givers and receivers of private transfers, a fact consistent with findings from SABE surveys (Saad, 2005), which are representative of the population of selected Latin American major cities. Considering the net flows, our estimates indicate that adults are net transfer private transfers for most of their life, until as late as their mid-seventies. At the older ages where the elderly are net receivers of private transfers, they represent a very small fraction of their income and consumption.

Figure 7. Per-Capita private transfers, Chile 1997

2.d) Asset reallocations

Even individuals that do not generate substantial labour income nor receive transfers to finance their consumption may resort to inter-temporal asset-based reallocations. Recall that asset-based reallocations are the difference between asset income and saving of each age group.

Figure 8 display the estimates for Chile, 1997. Per-capita net asset reallocations start to increase from the late teens, first slowly and then more rapidly until the peak in the early 50s, after which they fall until age 85. Income from assets rise very rapidly until age 60, after which they fluctuate at relatively high values. Net savings are low and often negative until as late as age 45, after which they become strongly positive, until the trend
reverses past the age of 80. This pattern is very similar to that of other developing countries, but is different from other countries such as the U.S. and Costa Rica, where net asset reallocations have no turning point, but keep increasing even at the oldest ages when savings are falling toward negative values.

Figure 8. Asset Reallocation, Chile 1997

2.e) Finance of consumption at different stages of the lifecycle

Table 1 presents a summary of the aggregate values of the NTA components of the life-cycle deficit in Chile in 1997. Recall that life-cycle deficit, for any individual or group of individuals, equals the sum of the net public transfers, net private transfers and asset based reallocations. However, aggregate net public transfers and the net private transfers must equal zero, because the sum of resources that are transferred (or given), somebody else is receiving. Thus at this aggregate level, the life cycle deficit equals asset based reallocations.

Table 1. Aggregate NTA values, Chile 1997

<table>
<thead>
<tr>
<th>AGGREGATE NTA VALUES</th>
<th>TOTAL (1997 pesos)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor Income</td>
<td>16,375,784,510,101</td>
</tr>
<tr>
<td>Private Consumption</td>
<td>18,744,432,000,000</td>
</tr>
<tr>
<td>Public Consumption</td>
<td>3,860,475,000,000</td>
</tr>
<tr>
<td><strong>LIFE CYCLE DEFICIT</strong></td>
<td><strong>6,229,122,489,900</strong></td>
</tr>
<tr>
<td>Public Transfers Inflows</td>
<td>5,791,040,000,000</td>
</tr>
<tr>
<td>Public Transfers Outflows</td>
<td>(5,791,040,000,000)</td>
</tr>
<tr>
<td><strong>NET PUBLIC TRANSFERS</strong></td>
<td>-</td>
</tr>
</tbody>
</table>
### Private Transfers

**Inflows**
- 9,116,636,000,000

**Outflows**
- (9,116,636,000,000)

**NET PRIVATE TRANSFERS**
- -

**Public Capital Income**
- 131,840,000,000

**Private Capital Income**
- 9,450,883,666,667

**Savings**
- 3,353,601,176,767

**ASSET BASED REALLOCATIONS**
- 6,229,122,489,900

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One noteworthy feature of the NTA accounts for Chile in 1997 is that even though they confirm the importance of public transfers as a means to redistribute resources in the population, net private transfers are even larger, and thus merit at least as much attention as a reallocation mechanism.

Another way to summarize the results discussed in previous sections is to look at the different sources of financing of the lifecycle deficit by broad net “dependent” and net “supporter” age groups, as shown in figure 9.

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**Figure 9. Finance of Consumption, Chile 1997**

- **Adults** in the net producing ages earn labour income 27% higher than their own consumption, and obtain substantial positive net asset-based income equivalent to 39% of their consumption. This provides them with sufficient resources to be net transfer givers of both private and public transfers, in amounts that represent 44% and 22% of their consumption, respectively.

- **Children and youth** under the age of 25 and adults aged 55 and older are net consumers (“dependents”), but their sources of support and degree of “dependence” are radically different. About 3/5 of the consumption of the younger dependents is funded by (mostly intra-household) private transfers, and another 1/5 by net public transfers. Since their...
labour earnings are negligible, the other fifth of their consumption is covered by public transfers (13%) and asset-based reallocations (7%), basically dis-saving. On the other hand, the older dependents (on average, those 55 years and older) finance more than ½ of their consumption with their own labour, and count on asset reallocations to finance another 44% of their consumption. Despite the fact that their labour earnings fall below their level of consumption, their sizeable asset-based income allow them to be net givers of private transfers that amount to 1/5 of their consumption.

Comparing to the more commonly used cut-off age of 65 for the elderly population (last stacked bar in the figure), we see that as the income from labour naturally finances a smaller share (about 1/5) of their consumption, public transfers play an increasing role in financing the consumption of the elderly, accounting for more than one-half of their consumption. At this stage of the life cycle, income from assets (30% of consumption) is also important but is declining as a source of finance of consumption. Notably, those aged 65+ do not rely on private transfers for their support; they are, as a group, in fact modest net providers of private transfers (4% of their consumption). As indicated above (section 2.c), older adults do not become net receivers until their late seventies, and then only to a minimal extent.


Incorporating the 1987 NTA estimates that have become recently available, we examine next some of the main changes in the accounts during the 1987-1997 period.

3.a) Changes in the lifecycle deficit

As regards the life-cycle deficit, two main changes are noteworthy (see figure 10): 1. A significant increase in consumption relative to labour income in almost all ages. This change was made possible by the growth in total income and is explained partly by increases in expenditures on private and public education (see section 3.c), but clearly extends to other expenditures and age groups; and 2. A substantial shift in labour income towards older ages, which we analyze in more detail next.

These changes have produced a modest decline in the cut-off average age at becoming a net producer, from 27 in 1987 to 26 in 1997, and no change in the average age of 54 at becoming an older-age dependent (net consumer). This average length of the period of net production, of about 27 to 28 years, is relatively short by comparison to more developed regions or the Asian NTA countries, where the net production phase is more typically around 31 to 33 years, but is well in line with Latin American countries, where most values are between 25 and 29 years.
Figure 10: Lifecycle deficit, Chile 1987-1997

![Graph showing lifecycle deficit](source)

Regarding the shift in the labour earnings curve, it must be noted that it is not a random occurrence or a reflection of particular conditions in 1987 or 1997, since this has been a fairly consistent trend over the last two decades. What explains this large shift in labour earnings over a 10-year period? In order to identify the immediate factors, we carried out a decomposition analysis, which shows that most of the change in labour earnings is explained by the increases in labour force participation, especially for the older workers (Bravo and Holz, 2007). This postponement of retirement is accompanied by increases in earnings per worker at some of the older ages, but the age pattern is not very systematic and its overall effect is small. Unemployment rates were basically unchanged during this period, and thus did not affect per capita labour earnings in any significant way.

We did further analysis of this question comparing the evolution of labour income in Chile with that of Costa Rica during 1990-1999, as a function of the composition of employment (Bravo and Holz, 2007). We concluded that the Chilean increase in labour earnings at the older working ages during 1987-1997 is associated to a large increase in the salaries of wage earners aged 60 and more, and with a more than doubling of the share of “employers” among older workers (from 5% to 11% of all workers aged 60+), which have earnings 4 to more than 5 times higher than wage earners and self-

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6 Recognizing that per capita labour income at each age equals the product of the (age-specific) labour force participation, the employment rate (1 minus the unemployment rate) and labour income per worker.

7 Defined by the ILO (2008) as “workers who, working on their own account or with one or a few partners, hold the type of job defined as a self-employed job, and in this capacity, on a continuous basis (including the reference period) have engaged one or more persons to work for them in their business as employees”.

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employed workers in this age group. By comparison, in Costa Rica, older managers earn only 2 to 3 times as much as other workers, and although their share among older workers is higher, they did not increase as much as in Chile.

The increase in the real incomes of older workers and the extension of the net production phase of the lifecycle is probably also an important factor behind the real increase of consumption at the older ages relative to mean earnings. The longer net production life-span also implies that the more recent generations are generating and accumulating more resources that they can use to finance consumption in the latter part of their life-cycle.

3.b) Public transfers

Consistently with the rightward shift of the curve of labour income by age, during 1987-1997 Chileans are remaining net tax payers for 6 additional years, from age 55 in 1987 to 61 in 1997, but they also are starting to pay net taxes from a slightly older age (starting at 19 years in 1987, 21 years in 1997). These new cut-off ages imply a period of net tax payment in 1997 of 40 years, not uncommon internationally.

The postponement of the beginning of net taxpayer phase is due to reduced labour force participation rates for youth under the age of 22, associated to the extension of their education. The shift in the age at becoming a net recipient of public transfers is mostly due to the increase of labour and non-labour direct income taxes, which gained importance vis-à-vis the value added taxes during this period.

3.c) Public and private education

The Chilean educational system has undergone significant changes over the last several decades. The military government (1973-1989) sought to privatize and to introduce market mechanisms into the system, with the declared aim of improving efficiency. In
this context, a 1981 reform included the decentralization of the operation and financing of the public schools, displacing those functions from the central government to municipalities. The reform also introduced a voucher system, and stimulated the creation of private universities while instituting much larger co-payments in the existing public universities. During the 1980s, private education expanded significantly, including fully and partially subsidized private primary and secondary schools, and numerous new private establishments (universities as well as post-secondary “institutes of technical training”). However, the system became more unequal, as resources were increasingly concentrated in the more expensive private schools while a reduced proportion and much lower per-capita resources were devoted to the public schools, serving a great majority of the middle and lower income population.

After the return to democracy, in 1991, a new reform was put in place with the objective of improving equity, introducing salary incentives for teachers and performance incentives for schools in lower income localities, with the aim to improve the quality of education in schools serving lower socio-economic groups. The student loan programs for higher education also expanded, targeting specifically students from lower income families. In recent years, new legislation has been approved that will further increase the government subsidies for the primary and secondary levels. As a result of these policies, real public expenditures during the 1990-97 has more than doubled, while real private spending also increased (by 42%) during this period.

The NTA estimates for 1987 and 1997, together with supplementary data from the CASEN survey, allows us to analyze in more detail the impact of these policies on the school-age population belonging to different socio-economic strata. As anticipated in section 3.a), per capita “consumption” in education increased significantly during 1987-1997, by an overall 50% (56% in public expenditures, 40% in private). The accounts further show (see figure 12) that private consumption in education increased mainly for pre-school children and the college-age youth, while public consumption expanded mostly in the secondary level but has actually contracted, on a per-capita basis, in the tertiary level.
Figure 12. Public and private per capita consumption in education, Chile 1987-1997

Consumption in Education, Chile 1987-1997 (relative to average labor income 30-49)

Source: NTA estimates for Chile, Bravo and Holz (2007)

Part of the increased per capita spending is explained by an increased coverage of the relevant population age groups, that is to say, higher attendance rates of the school-age population (see figure 13) of all the educational levels, more markedly so in the pre-primary and tertiary school-age populations.
Figure 13: School attendance rates by age: Chile 1987-1997

Source: CASEN surveys Bravo and Holz (2007)

Figure 13 makes also clear that there is still much room for improving the population coverage of pre-schoolers and college-age youngsters, while those in the primary and most in the secondary level ages are nearly universally covered.

Still, and in spite of continuous improvement over the last 20 years, the socioeconomic disparities in attendance remain large. For example, children from households in the highest income quintile in 1997 had primary-level attendance rates that doubled those of the kids from the lowest quintile; at the secondary level that gap was 20%, and in the tertiary level, that difference was more than 5-fold (CASEN 1998). More recent data (CASEN 2006) suggest that these income-differentials have lessened significantly (to 8% higher attendance rates in 5\textsuperscript{th} quintile vis-à-vis the 1\textsuperscript{st} quintile, and 3,4-fold in the tertiary level). Differences in per-student expenditures across income quintiles are not as wide as those in attendance rates, (with the exception of the primary level, where attendance is virtually universal across all socioeconomic strata) but are still very substantial and thus reinforces the inequalities in attendance.

In sum, government policies emphasizing the improvement of equity in the educational system are well placed as the socio-economic differences in attendance, in spending and in the quality of education remain large, in spite of their gradual improvement over the last couple of decades. Recent initiatives and policies focusing on young children are particularly foresighted. The NTA data provides additional perspective and detailed evidence on these issues, by identifying the specific generational groups that have
benefitted from the ensemble of public expenditure (not just the cash transfers of some specific social programs), that is to say, secondary-age teenagers and in more recent years, pre-school children. Taking a broader time perspective, we can hypothesize that a number of generations, especially those that reached post-secondary ages during the 1980s and early 1990s, did not benefit from the coverage and quality of public education as the previous generations did, and will not benefit from the more progressive policies initiated during the 1990s.

The NTA accounts also reveal that per capita public expenditures in the tertiary level, that corresponds to the late teen ages and early twenties, have not kept up pace with those of younger children. Providing more extensive access and better quality education to this population group will remain a key policy concern in years to come, and an intensification of the policies in this regard could make an important contribution to the development of the country on various accounts: a) the compliance with basic rights to education of good quality and equal opportunities for all; b) consequent favourable effects on health, labour force participation, employment, and thus increased present and future productivity; c) extending further the net production phase of the life-cycle, allowing for the generation and accumulation of more resources to finance retirement.

4. Conclusions

This examination of new results and analysis of intergenerational reallocations for Chile during 1987-1997 on the basis of NTA accounts, allows us to make the following observations.

Labour earnings in Chile are an important source of maintenance for the great majority of adults, even for the elderly, in a greater proportion than in countries with similar levels of development and social security coverage. Consumption displays a smooth, somewhat dampened age profile that falls in between the more pronounced inverted-U shape found in the lowest income countries and the upward-sloping consumption curve observed in today’s more developed countries.

In 1997, those under the age of 27 and older than 54 are on average economically dependent, in the sense that individuals in both groups produce less than what they consume. But there are clear differences in their economic status and degree of economic dependency: older adults are much less “dependent” on sources of income beyond the resources that they can avail themselves through work and asset reallocations. In 1997, this may well be reflecting the effects of the privatization reforms initiated in the 1980s, especially that of the pension system which has increased private saving for old-age and gradually reduced the weight of publicly-provided pensions.

Public inflows (benefits) to individuals are mostly in-kind health, education and collective goods received in different intensities by all population age groups. Pension cash transfers received by the elderly represent about one third of all public transfers, and constitute by far the largest public transfer on a per capita basis, several times larger than those received by children or younger adults. However, since there are still many more younger than older persons in the population, the aggregate public spending on children and teenagers is roughly comparable to that on the elderly.
Cash public transfers appear to have a much greater impact in reducing poverty among the elderly than any other age group. In this regard, there is a legitimate concern that poverty is still heavily concentrated in children, the future generations of citizens, producers and taxpayers. Nonetheless, a careful and comprehensive distributional analysis must also take into account in-kind transfers and public outflows (taxes). The appropriate information basis to allow for this in generational terms is being generated by the NTA time series under construction.

Private transfers are the main source of financing consumption for children, but are not of great importance for any other age group. As stated before, the elderly rely to a significant extent on net public transfers, but are not substantial receivers of net private transfers. Interestingly though, persons in all the adult age groups both give and receive private transfers, confirming previous evidence from Chile and other Latin American countries that private support among adults tends to be mutual.

Asset reallocations finance more than two-fifths of the consumption of adults, and they are a particularly important increasing source of support for the elderly. Asset reallocations will probably increase over time, considering the aggregate trend in private savings and the accumulation of private pension funds since the 1980s.

Form 1987 to 1997 there was little change in the length of the “net producer” period in the lifecycle, which remained at about 28 years, a value well in line with that of other Latin American countries, but several years lower than in developed countries and in developing countries in Asia. Consumption rose in almost all ages, spurred by increasing incomes and in the case of school-aged children and youth, by significant increases in public expenditures in education.

During this period, labour earnings increased substantially and shifted toward older ages mainly as a result of increased labour force participation and changes in the composition of employment at the older ages. This development will allow for a more extended period of lifetime accumulation of assets and probably reinforce the trend toward greater reliance on asset reallocations at the older ages. The lifecycle phase of “net taxpayer” was extended significantly over 1987-1997, by almost 6 additional years, due to increased income in the middle and older adult ages, and of direct income taxes.

Both private and public spending in education increased substantially over this period, with public spending making an important contribution to reduce the inequalities in attendance and the quality of education received by children and youth from the lower socio-economic strata. Progress still needs to be made in expanding the population coverage of children under 5 years of age and in tertiary education, but the recently inaugurated programs for early child development and policies that will increase subsidies for the primary and secondary levels will probably continue to reduce inequities in the education sector. They will also contribute to increase the productivity of the labour force and to strengthen the basis for financing lifetime consumption of the future generations of workers and the elderly.
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