NATIONAL TRANSFER ACCOUNTS
Understanding the generational economy

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Transferring resources between age groups: What roles do governments play?

Over the past 100 years, most governments have steadily expanded social programs that provide cash and services to children and the elderly. By the beginning of the 21st century, public transfers were equivalent to nearly one-fourth of Gross Domestic Product (GDP) in industrialized countries and more than one-half of their total government budgets. In most countries, public transfers are concentrated heavily in public pensions and in social-sector programs that finance education and healthcare.

These programs are funded by taxes paid largely by the working-age population. Thus changes in the relative size of the three age groups—children, working-age adults, and the elderly—have a significant impact on the size of government programs and on the resources available to pay for them.

Against a backdrop of declining mortality and fertility, governments around the world first enjoy expanding tax revenues as the proportion of their populations at working ages increases. At the same time, the costs of social programs financed by these revenues may go down as the proportion of children requiring education declines. Later on, costs begin to rise as elderly populations expand, leading to greater demand for pensions and healthcare services. And at the same time as governments are faced with rising costs, the proportion of working-age taxpayers is shrinking.

Faced with these changes, what should governments do? What extra resources will they enjoy when their working-age populations are large? And what extra expenses must they anticipate as their elderly populations expand?

Who pays for public benefits and who receives them?

The National Transfer Accounts (NTA) project helps shed light on government opportunities and challenges by providing information on taxes paid and public benefits received by all age groups. Figure 1 shows the typical age profiles of tax revenues and government expenditures for education, pensions, and healthcare in 20 NTA economies.

All age groups pay some taxes because they consume items that are subject to consumption taxes, such as sales, excise, and VAT taxes. The elderly pay additional taxes because they generally own more assets than other age groups so they are more likely to pay property taxes. But working-age adults pay the bulk of taxes—in the form of consumption taxes plus income tax and social-security contributions—beginning in their 20s when they enter the labor market, peaking in their early 50s, and then declining steeply when they retire. The mixture of revenue sources differs in specific economies, but the general pattern is that government tax revenues are drawn primarily from the working-age population.

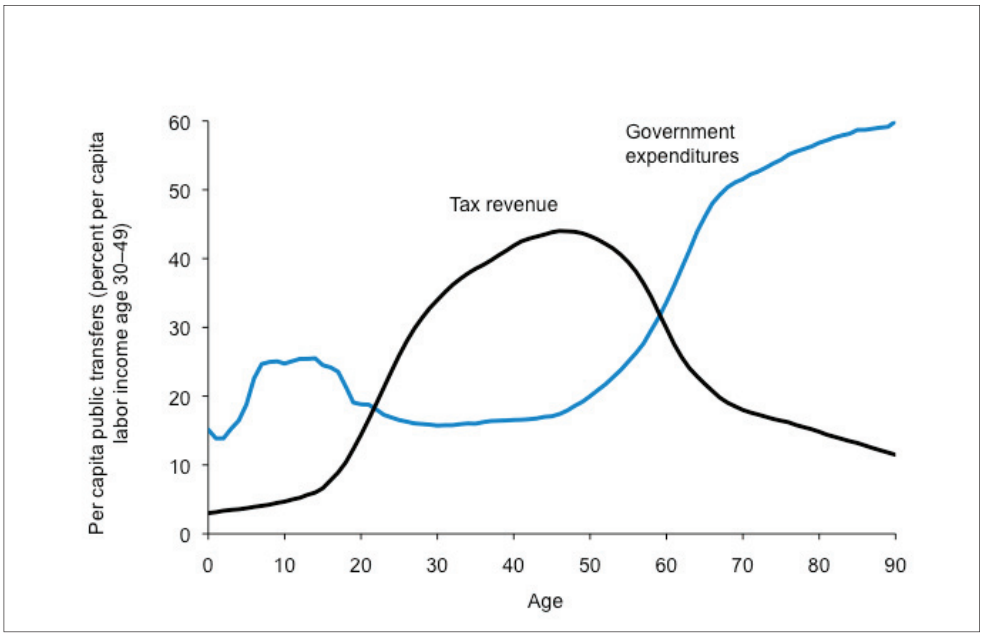

Figure 1. Per capita public-transfer inflows and outflows by age: 20 economies around 2000.
Source: **Author's calculations based on data from the NTA website (www.ntaccounts.org).**

Much of this revenue is used to support programs for children and the elderly. Children receive benefits mainly in the form of public education, which accounts for about 45 percent of public transfers to children in the 20 NTA economies. Figure 1 shows a plateau in public-transfer inflows from ages 6 to 18, corresponding to the ages of primary and secondary schooling.

Young workers receive a minimum of government spending, mainly in the form of general programs—such as public services, defense, and transportation—that are distributed equally to all members of the population. As workers age, they tend to receive more publicly funded health benefits and disability payments. Then sharp increases are seen as workers reach their late 50s and early 60s, reflecting pension benefits and the rising use of health services.

Who receives more: Children or the elderly?

Government spending programs vary widely in the resources they provide to children and to the elderly and the balance between the two groups. On an annual basis, average net benefits received by each child (age 0–19) range from 8 percent of the average labor income of an adult age 30–49 in Uruguay and the Philippines to 29 percent in Finland. The average net benefits received by an elderly person (age 65+) range from –2 percent of the average labor income of a prime working-age adult in Thailand, where the elderly pay more in taxes than they receive in benefits, to 87 percent in Brazil, where the elderly receive particularly generous government pensions.

The median values of net public transfers to children (16 percent of the per capita labor income of adults age 30–49) and to the elderly (38 percent) in 20 NTA economies divide Figure 2 into four quadrants. The general pattern that emerges is a strong positive correlation between public transfers to both age groups. Thus Japan and the European economies (with the exception of Spain) lie in the upper-right quadrant, with relatively large transfers to children and the elderly, while most Asian economies lie in the lower-left quadrant, with relatively small transfers to both groups.

Taiwan, Spain, and the United States (US) lie in the upper-left quadrant, with relatively high levels of transfers to children combined with low levels of transfers to the elderly. All Latin American economies have relatively low levels of public investment in children. Chile, Costa Rica, and Brazil stand out with low public transfers to children coupled with high public transfers to the elderly.

Although Japan and most European governments provide generous benefits overall, they all spend more in the

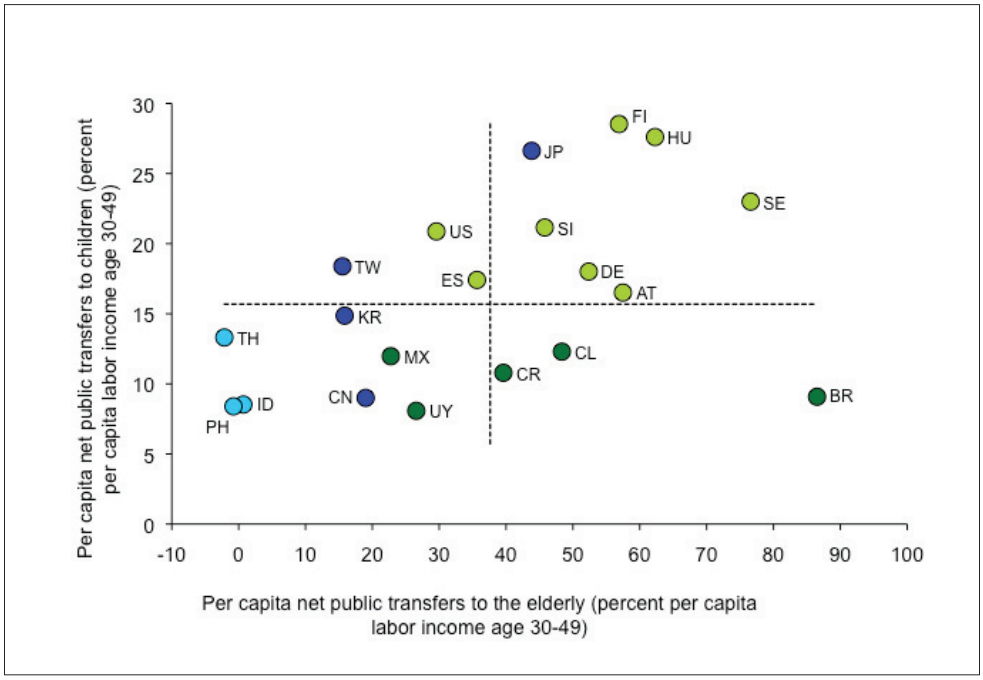

Figure 2. Per capita net public transfers to children and the elderly: 20 economies around 2000.
Source: **Author's calculations based on data from the NTA website (www.ntaccounts.org).**
Note: **The economies are Austria (AT), Brazil (BR), Chile (CL), China (CN), Costa Rica (CR), Germany (DE), Spain (ES), Finland (FI), Hungary (HU), Indonesia (ID), Japan (JP), South Korea (KR), Mexico (MX), Philippines (PH), Sweden (SE), Slovenia (SI), Thailand (TH), Taiwan (TW), United States (US), and Uruguay (UY).**

Table 1. Public-sector transfers in 20 economies around 2000: Balance between transfers to children and to the elderly.

Economy	Aggregate net public transfers to the elderly relative to transfers to children	Elderly population relative to child population	Average net public transfers to an elderly person relative to transfers to a child
Germany	2.56	0.88	2.91
Sweden	2.38	0.72	3.33
Austria	2.32	0.67	3.48
Japan	1.67	1.02	1.65
Hungary	1.65	0.73	2.26
Spain	1.62	0.79	2.05
Slovenia	1.58	0.73	2.16
Uruguay	1.39	0.42	3.29
Finland	1.34	0.67	1.99
Brazil	1.21	0.13	9.53
Chile	0.79	0.20	3.93
United States	0.63	0.44	1.42
Costa Rica	0.55	0.15	3.67
China	0.45	0.22	2.11
South Korea	0.26	0.25	1.07
Mexico	0.23	0.12	1.90
Taiwan	0.22	0.27	0.84
Indonesia	0.01	0.15	0.08
Philippines	-0.01	0.07	-0.09
Thailand	-0.03	0.21	-0.16

Source: **Miller forthcoming. Author's calculations based on population estimates and projections from the United Nations (2009) and age profiles of public transfers from data on the NTA website (www.ntaccounts.org).**

aggregate on the elderly than they do on children (Table 1). This is a product of their relatively generous public pension and healthcare programs and their large elderly populations.

Brazil is an interesting outlier in that it ranks with European countries by spending more in the aggregate on the elderly than on children, but its elderly population is relatively small (13 percent of its child population). In fact, the Brazilian government spends more than nine times as much on an elderly person as on a child. This anomaly is due to Brazil's generous public pension programs combined with its low level of investment in public education. Chile and Costa Rica are also notable in this regard—average net public transfers to the elderly are nearly four times those to children.

How does population change affect government budgets: The fiscal support ratio

To begin assessing the impact of population change on government budgets, the NTA project uses the age profiles of public transfers to calculate a "fiscal support ratio." This is defined as the ratio of tax revenues received to public transfers paid out for education, pensions, and healthcare.

As a population ages and the number of tax payers first rises and then falls in relation to the number of beneficiaries, the fiscal support ratio first goes up and then goes down. The upward change suggests how much extra funding will be available, either for expanding programs or for cutting taxes. The downward change indicates the relative size of the tax increases or benefit cuts that will be needed to return to the initial fiscal position.

Table 2 estimates changes in the fiscal support ratios of 20 NTA economies over a 100-year period. These estimates are based on the age profiles of public-transfer inflows and outflows observed in each economy for a recent year, combined with estimates and projections of the population by age from 1950 through 2050. The fiscal support ratio in the base year of 2010 is set to 100 percent, corresponding to a situation in which aggregate taxes are equal to aggregate benefits.

Underlying these calculations is the assumption that the shape of the age profiles for taxes and benefits remains fixed over time, shifting up or down at the same rate as the economy. Total taxes only rise or fall relative to benefits because of changes in the relative size of different age groups within the population.

Economies are ranked in the table according to the size of the fiscal adjustment they will need to make in the future in response to changes in population age structure. Of all the NTA economies, the fiscal impact of population aging is projected to be most severe in Brazil. Population aging there, combined with current age patterns of taxes and benefits, will lead to a 31 percent decline in the fiscal support ratio by 2050. Either benefits will need to be cut by 31 percent before 2050 or taxes will need to increase by 45 percent or some combination of the two.

Brazil is by no means alone in facing such mounting fiscal pressures. Among NTA members in Europe, declines in the fiscal support ratio by 2050 range from 28 percent in Slovenia to 14 percent in Sweden. Among other Latin American countries, declines in the fiscal support ratio range from 28 percent in Chile to 10 percent in Uruguay. In Asia, the three economies with the most severe projected fiscal impacts are Japan, with a projected decline of 26 percent, and China and South Korea, each with a decline of 20 percent. The fiscal support ratio in the US is projected to decline by 11 percent.

More realistically, we expect the age profile of public benefits to shift over time—for example, with increased investment in education for children and increased investment in healthcare for the elderly. In addition, reforms of public pensions toward mandatory saving programs for workers, such as those undertaken in Chile, Germany, and other Latin American and European countries, will lead to a significant shift in the burden of population aging away from public programs toward family resources and the use of savings and investment income. The NTA data can be combined with these more realistic assumptions about changing public benefits to produce medium- and long-term fiscal forecasts.

NTA: An important tool for policymakers

The National Transfer Accounts provide important information for public policy choices. They enable governments to monitor the full scope of their policy actions by accounting for the effects of tax policies and spending programs. They also allow governments to assess the roles played by other economic actors (financial markets, families, civil society) in providing support for dependent age groups. And because the NTA project brings together a diverse group of economies, governments can compare their policies, and the effects of those policies on the wellbeing of their populations, with the experiences of other societies.

Using population projections, NTA makes it possible to forecast the likely fiscal impact of population aging, given each economy's unique tax and benefit structure. This analysis shows that half of the economies facing severe fiscal shortfalls are in Latin America.

NTA analysis also sheds light on how governments balance their treatment of children and the elderly. Countries that provide significantly more resources to the elderly than to children include Brazil, Chile, Costa Rica, and Uruguay in Latin America and Austria and Sweden in Europe.

The NTA methodology provides the basis for long-term fiscal forecasts that are particularly important to governments for two reasons. First, some of the policy choices with the largest rewards, such as investment in public education, have very long delays between investment and payoff. A short-term policy focus will fail to measure the full extent of the return on long-term investments. Second, a long-term policy focus promotes modest "course corrections" that are politically more feasible than large, abrupt changes. Such a long-term approach provides smooth transitions in spending and tax policies and is less likely to burden any particular generation unfairly.

Table 2. Fiscal support ratios for 20 economies, 1950–2050.

	Fiscal support ratio (percent)					
Economy	1950	2010	2020	2030	2050	Year of most favorable age structure
Brazil	100	100	94	86	69	2000
Chile	94	100	93	83	72	2004
Slovenia	101	100	91	81	72	2002
Spain	94	100	96	87	73	2010
Austria	108	100	93	83	74	1950
Japan	91	100	92	87	74	1976
Germany	111	100	94	84	75	1950
Costa Rica	89	100	97	91	76	2012
Hungary	106	100	97	93	77	1950
Taiwan	68	100	99	92	79	2014
South Korea	76	100	97	89	80	2008
China	90	100	96	89	81	2011
Finland	108	100	92	87	83	1991
Mexico	85	100	102	99	86	2019
Sweden	115	100	96	90	86	1950
United States	99	100	96	92	89	2006
Uruguay	108	100	100	98	90	1959
Thailand	66	100	104	104	104	2039
Indonesia	79	100	106	110	108	2033
Philippines	87	100	106	111	116	2050

Source: **See Table 1.**
Note: **Economies are ordered by the severity of the projected fiscal impact in 2050. Revenues and expenditures are projected assuming that per capita taxes and public expenditures by single year of age remain constant at base-year values. Thus, values that differ from 100 percent are the result of changes in population age structure. Values less than 100 percent indicate a decline in tax revenues relative to expenditures.**

Additional resources

Miller, Tim. Forthcoming. The rise of the intergenerational state: Ageing and development. In Ronald D. Lee and Andrew Mason, eds. *Population aging and the generational economy: A global perspective.* Cheltenham, UK: Edward Elgar.

United Nations. 2009. *System of National Accounts.* http://data.un.org/Browse.aspx?d=SNA. Accessed 15 September 2009. New York: United Nations, Statistical Division of the Department of Economic and Social Affairs.