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ABSTRACT

This study uses fiscal gap accounting (FGA) and generational accounting (GA) to compare US and Italian fiscal solvency. FGA and GA incorporate all government outlays and receipts, whether put on or kept off the books. FGA measures, in the form of reduced net outlays, the constant share of each future year's GDP needed to balance the government's intertemporal budget. GA calculates the lifetime net tax rate – lifetime taxes divided by lifetime labor earnings -- facing future generations if current generations pay nothing more, on net, than current policy mandates. Deficit accounting suggests that Italy's 135 percent debt-to-GDP ratio places it in worse fiscal shape than the US with its 123 percent ratio. But on a fiscal-gap basis, Italy appears in far better shape regardless of the discount rate used. Based on the theoretically appropriate rate – the average real return to national wealth, the U.S. fiscal gap is 7.4%. Italy's is 4.0%. These requisite solvency adjustments are far larger if delayed or if the UN's more pessimistic demographic projections prevail. Neither country can expect future generations, on their own, to cover their government's red ink. Doing so requires levying lifetime net tax rates, in each country, that exceed 100%.

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1 Introduction

Postwar aging, low labor productivity growth, and intergenerational transfer policies threaten the fiscal solvency of advanced economies. This paper examines and compares long-term fiscal sustainability in the US and Italy. It does so based not on traditional deficit accounting, but rather on fiscal gap accounting (FGA) and generational accounting (GA). Official deficits, despite their ubiquitous calculation and citation, are linguistic constructs, not measures of a well-defined economic concept. Indeed, they are no better defined by economics than absolute time and absolute distance are defined by physics. This reflects the labeling problem (see Kotlikoff (1986), Kotlikoff (1988), Kotlikoff (1989a), Kotlikoff (1992), Kotlikoff and Burns (2004), Kotlikoff and Green (2009), Kotlikoff (2003), and Kotlikoff and Burns (2012)) – the ability of governments to arbitrarily declare particular liabilities official (on the books) and others unofficial (off the books). The labeling problem is intrinsic. It applies to all economic models, which, of course, comprise equations whose collective implications are independent of the language, including fiscal labeling, with which their equations are discussed.

Economic models include those with uncertain policies, including reneging on payment commitments. But the arguments of such probabilistic distribution functions are economic states of nature, not elements of grammar. Hence, calling a government promise "official" does not tell us about the probability of payment. Given the infinite number of internally consistent and state-contingent ways to label a government's past, current, and projected future outlays and receipts, there is an infinite number of deficit paths available for construction and perusal. But none in itself bears any necessary relation to a nation's underlying fiscal condition. This holds equally well for the "official" deficit. The government's word choice isn't sacrosanct and its deficit reports, past and projected, are as economically arbitrary as any other.

In contrast, fiscal gap and generational accounting are invariant to fiscal labeling. Fiscal gap accounting determines the constant share of GDP required, in the form of reduced outlays, higher receipts, or a combination of the two, to eliminate the fiscal gap – the present value difference between projected future outlays (including official debt service) and receipts. The ratio of the fiscal gap to the present value of projected GDP conveys the immediate and permanent adjustment to the path of net outlays required for fiscal solvency. The framework readily conveys the degree to which delay raises requisite permanent spending cuts or tax hikes. Generational accounting considers a particular means of closing a country's fiscal gap. It measures what future generations – born next year and thereafter – will need to pay in lifetime net taxes – the present value, to a cohort's year of birth, of its annual future taxes paid net of transfer benefits received – if current generations pay nothing more, on net, than current policy mandates.

This paper uses the latest US and Italian official fiscal and demographic projections to calculate and compare the two countries' fiscal solvency. Our central finding is striking. Italy is in far better fiscal shape than is the US for all plausible discount rates. If we follow the European Commission, Directorate-General for Economic and Financial Affairs (2025) and use a low, in our case, 2-percent real discount rate, Italy's

fiscal gap is 0.7 percent of annual GDP. This sanguine description of Italy's fiscal sustainability accords with European Commission findings reported in its Fiscal Sustainability Reports, which date back to 2006 (see *The Long-Term Sustainability of Public Finances in the European Union* (2006)). These FGA studies have consistently ranked Italy as one of the most fiscally sustainable countries in the EU. This ranking is at complete odds with that based on country-specific, official debt-to-GDP values. Italy's official debt ratio is the second highest among the 27 EU member countries. Luxembourg has the EU's third lowest debt-to-GDP ratio, but the third highest fiscal gap.[1] Hence, deficit accounting is far off the mark, not just in theory, but in practice.

Discounting at 4.0 percent – the, as argued below, theoretically more appropriate rate given the average real return on Italian national wealth, produces a 3.99 annual percent of GDP fiscal gap. In this case, a modest – 7.3 percent – immediately and permanent increase in the path of Italian tax revenues suffices to close the gap. So does a modest – 7.4 percent – immediate and permanent decrease in government spending, apart from paying interest and principal on official debt. Obviously, combinations of tax hikes and spending cuts can also achieve fiscal solvency. In particular, our Italian results do not incorporate recent European fiscal rules that mandate relatively high future primary structural surpluses. Hence, our Italian fiscal gap and generational accounting results are, arguably, upper bounds.

The US total government (federal and state) fiscal gap is both far higher and far less sensitive to the discount rate. It equals 4.25 percent of annual GDP based on 2.0 percent discounting and 7.4 percent of annual GDP based on 6.0 percent discounting – roughly the average real return on postwar US national wealth. Based on 2 percent discounting, the immediate and permanent increase in the annual path of US taxes or reduction in the path of annual non-interest spending needed to achieve fiscal balance are 15.2 percent and 13.5 percent, respectively. At 6.0 percent real discounting, the respective adjustments are 26.5 percent and 23.9 percent.

Although Italy can achieve fiscal balance and, thus, generational balance without massive fiscal adjustments if it does so quickly, relying on future generations to close its fiscal gap is infeasible regardless of the discount rate. Doing so would require levying astronomical lifetime net tax rates on all future Italians. This reflects the relatively small number of projected future Italians available to share the fiscal burden as well as Italy's projected low rate of labor-productivity growth.[2]

Leaving future generations to cover America's fiscal gap is also infeasible based on appropriate, 6 percent, discounting. Such a policy requires levying a 104.2 percent lifetime net tax rate on those born next year and thereafter. Using a 2 percent discount rate, the requisite lifetime net tax rate on future generations is modest - only 9.1 percent, but it is still 22 percentage points higher than the −12.9 lifetime net tax rate facing today's newborns.

Given the very different shapes of US and Italian net-tax age profiles, generational accounting for both

[1] EU S2 fiscal gaps.

[2] Italy's labor productivity growth rate has averaged 0.6 percent since 2000 and is projected to average 0.6 percent from 2025 through 2049, rising to 0.7 percent thereafter according to the Ministry of Finance.

countries is highly sensitive to the choice of discount rates. Moreover, lifetime net tax rates facing US newborns are negative for all discount rates considered. In contrast, they are very high for Italian newborns at low rates, becoming negative at very high rates. Negative lifetime net tax rates can arise due to treating educational expenditures on primary, secondary and tertiary education as transfer payments to the relevant age groups. Our findings are robust to reasonable variations (± 0.5 percentage points) in assumed productivity growth rates. But adoption of UN, rather than official government demographic projections makes some difference, slightly improving our US fiscal sustainability measures and slightly worsening our Italian measures.

To summarize, based on appropriate discounting, three things are clear. First, the US fiscal gap is roughly twice Italy's. Second, achieving fiscal solvency – eliminating each country's fiscal gap – requires across-the-board spending cuts or tax hikes that are almost three times larger for the US than for Italy. Third, neither country can leave future generations to close their fiscal gaps. Doing so would require levying confiscatory lifetime net tax rates – rates above 100 percent – on future US and Italian generations.

Section 2 proceeds with a brief review of the literature. Section 3 provides a brief demographic and economic overview of the two countries. Section 4 recapitulates the mathematics of fiscal gap and generational accounting. Section 5 makes the case for discounting at the real return to national wealth, which is much higher for each country than its real government borrowing rate. Section 6 discusses data and assumptions behind our exercise. Section 7 presents a baseline fiscal gap that accounts for both countries, and the fiscal cost of delay. Section 8 turns to generational accounting. Section 9 shows the limited impact of even 20 percent reductions in discretionary spending/consumption of the general government. Section 10 examines the sensitivity of our results to alternative demographic projections, primarily those of the UN. Section 11 summarizes and concludes.

2 Literature Review

Kotlikoff first questioned the theoretical grounding of deficit accounting in Kotlikoff (1986). He expanded his critique, on his own and with co-authors, in Kotlikoff (1988), Kotlikoff (1989b), Auerbach and Kotlikoff (1987a), Kotlikoff (1992), Kotlikoff (2003), Kotlikoff and Burns (2004), and Kotlikoff and Green (2009). Kotlikoff (2003) is particularly instructive. It presents a series of models that illustrate the labeling problem under uncertainty, time-inconsistent policy, credit constraints, imperfect markets, incomplete markets, and work and saving disincentives. Kotlikoff and Green (2009) provides a general proof that the labeling problem arises in all rational economic models, models comprising equations whose collective workings bear no connection to how they are discussed or the manner in which agents communicate. Auerbach et al. (1991) introduced fiscal gap accounting (FGA) and generational accounting (GA) as an alternative to deficit accounting. Subsequent methodological and country-specific FGA and GA studies include Auerbach et al. (1991), Franco et al. (1994), Auerbach et al. (1992), Kotlikoff (1992), Auerbach et al. (1993), Fehr and

Kotlikoff (1995), Auerbach et al. (1999), Kotlikoff and Raffelhüschen (1999), Raffelhüschen (1999), Kotlikoff and Raffelhuschen (1999), Cardarelli et al. (2000), Kotlikoff and Green (2009), and Bonin (2013).

GA in Italy dates back to the early 1990s. Franco et al. (1994) is the first non-US application of generational accounting. Sartor (1997), Sartor et al. (1999), Cardarelli and Sartor (2000) and Rizza and Tommasino (2010) provided updated Italian GA assessments through 2008. Sartor (2001) examined Italian pension reforms through the lens of GA. Balassone et al. (2011) compared sustainability indicators and intergenerational fairness for selected EU countries. And Arevalo et al. (2019) applied GA to all EU-member countries.

Since their initial development in 1989, FGA, GA, or both have been conducted in close to 50 countries. The list includes essentially every major advanced economy and a range of middle-income and emerging economies, including Thailand, Argentina, Brazil, Mexico, South Korea, Russia, and El Salvador. As indicated, since 2006, the European Commission has measured the fiscal gap, which it calls the S2 indicator, for all 27 European Union members as part of its triennial Fiscal Sustainability Report. (European Commission, Directorate-General for Economic and Financial Affairs (2025)). Other governmental bodies and international institutions have conducted or facilitated fiscal gap and generational accounting studies.[3] GA is more data intensive than FGA. In particular, it requires projecting how much existing generations will pay under current policy in taxes net of transfers, all valued in the present. This, in turn, necessitates calculating age-tax and age-transfer profiles for use in forming generation-specific, lifetime net tax payments, and lifetime net-tax rates – the present value of lifetime net taxes divided by the present value of lifetime labor earnings.

Both FGA and GA are partial equilibrium frameworks meant to provide policymakers with a basic assessment of their countries' fiscal sustainability and the potential fiscal burdens being imposed on future generations. Partial equilibrium misses, of course, economic-feedback effects. Diamond (1996) stressed the importance of adjusting generational accounting for such general equilibrium (GE) impacts. Fehr and Kotlikoff (1995) used the Auerbach-Kotlikoff model (Auerbach and Kotlikoff (1987b)) to do so. They found, as expected, that FGA and GA understate the costs to young and future generations of any policy that expands current consumption, be it intergenerational redistribution that induces older generations to spend more or the decision to increase current government discretionary spending. The added economic injury reflects the crowding out of capital and its associated increase in real returns and reduction in real wages arising from such policies. Such GE impacts are, of course, smaller for a small open economy, like Italy, which accounts for just 2 percent of world GDP, than for the US, which accounts for roughly one-quarter of world output. Thus, FGA and GA provide lower-bound estimates of the welfare losses visited on a country's progeny from running fiscally unsustainable policy.

Ideally, one would simulate current policy in a fully stochastic, overlapping generations, general equilib-

[3]The list includes the US Treasury, the US Office of Management and Budget, the General Accountability Office, H.M. Treasury, the Bank of Japan, the Bank of Italy, UNICEF, the Netherlands Bureau for Economic Policy Analysis, the Bundesbank, the World Bank, the IMF, Statistics Canada, the Australian Treasury, and the Treasury of New Zealand.

rium model. Doing so would require specifying policy adjustments over time. This said, generational policy is a zero-sum game. Hence, if early generations consume more, future generations will collectively be forced to consume less regardless of the precise nature and timing of the adjustment to unsustainable policy.[4]

Progress has been made in developing such models. Harenberg and Ludwig (2015), Hashanhodzic and Kotlikoff (2019), and Hasanhodzic and Kotlikoff (2024) are examples. Each study simulates a large-scale stochastic OLG in full general equilibrium. Harenberg and Ludwig (2015) incorporates both idiosyncratic and macro shocks. They avoid the Curse of Dimensionality by using Krussell-Smith's (Krusell and Smith Jr (1999)) sufficient-statistic method to approximate the state space. Hashanhodzic and Kotlikoff (2019) and Hasanhodzic and Kotlikoff (2022) feature 80-period models with both productivity and depreciation shocks. Their solution incorporates the entire state space, but uses the projection method to avoid the curse. Kotlikoff et al. (1986) is an early application of the projection method. But Marcet (1988), Marcet (1991), and Den Haan and Marcet (1990) are the seminal contributions with Judd (1996), Judd et al. (2010), Judd et al. (2012), Maliar (2012), and Maliar and Maliar (2015) further extending and applying this methodology.

3 The US and Italy – a Demographic and Economic Overview

As table 1 indicates, the US now has close to 350 million people – almost six times Italy's 59 million population. Although both countries' fertility rates are below the 2.1 zero population growth (ZPG) replacement rate, Italy's 1.22 rate is well below the 1.62 US rate. As figure 1a shows, Italy's fertility rate started falling in the mid 1960s, hit the current US rate in 1980, and then continued to fall until the mid 1990s. After rebounding somewhat through 2010, it began to fall again with the current rate close to a postwar low. In 2007, U.S. fertility was at ZPG. Since then, it has steadily declined.

Their different fertility histories and Italy's past lower rate of net migration (figure 1b) largely explains the relative population growth of the two countries. Since 1950, the US population has more than doubled. In contrast, the Italian population has risen by only 26 percent. Part and parcel of growing at a slower rate is aging at a faster speed. Roughly one in three Italians is now 60 and older compared with roughly one in four Americans. This sizeable difference in the elderly's population share also reflects a third key factor. Italians live four years longer, on average, than do Americans.

According to the CBO (the Congressional Budget Office) and ISTAT (the Italian National Institute of Statistics), the US fertility rate is projected to remain roughly fixed, whereas Italy's rate is projected to rebound somewhat, but gradually – from its recently reported 1.18 2024 rate to 1.43 in 2075. Immigration rates are projected to decline in both countries. On balance, both countries will substantially age. By 2075, 34 percent of Americans and 42 percent of Italians will be 60 plus. Both figures can be compared with the

[4]This abstracts from policy changes that deliver economic efficiency gains arising, for example, from improved intergenerational risk sharing; see Bohn (1995), Bohn (1998), Blanchard and Weil (2001), Smetters (2003), Krueger and Kubler (2006b), Ball and Mankiw (2007), Bohn (2009), Blanchard (2019), Brumm et al. (2022), and Brumm et al. (2024).

current 36 percent elderly share of the world's oldest nation – Japan.

The major demographic concern facing all countries with lower than ZPG fertility is population implosion. Demographic collapse doesn't occur overnight. Fertility declines can take decades to materially reduce population sizes. In the short run, populations can grow even as their fertility rates fall as large birth cohorts in recent decades move into their child-bearing years. This is the US medium-term population story. Its 2075 population is scheduled to reach 373 million – up from 350 million today. But, as figure 2 shows, that will likely represent the country's population peak with population declining thereafter. Italy with its very different fertility and immigration history, will see a massive 20 percent population decline over the next half century – from 59 million today to 47 million in 2075.

As table 2 and figure 2 show, the UN projects much more rapid US population growth than the CBO, entailing an additional 55 million Americans at the end of the century. In contrast, the UN is far more pessimistic than ISTAT about Italy's future population decline. The UN foresees around 35 million Italians in 2100. On the other hand, EUROSTAT – the Statistical Office of the European Union – suggests there will be 10 million more Italians in 2100 than does ISTAT.[5] Table 2 presents the UN version of table 1. The UN projects markedly higher life expectancy for the US and markedly lower net immigration for Italy. These appear to be the main factors leading to the major divergence in future projected population counts. Interestingly, the UN projections of population age distributions are quite similar for both countries to official government values.

Although the U.S. population is now just under six times that of Italy, U.S. GDP (see table 3) is 13 times larger.[6] US GDP per capita is, thus, more than twice that of Italy.[7] Given higher projected U.S. population and productivity growth, US GDP will be 18 times Italy's GDP in 2075. US per capital GDP will also increase relative to Italy's, albeit not by much. Italian workers not only earn far less than US workers, on average. But Italy, as a whole, earns a lower real return on its national wealth. The average post-1946 US real return is 6.02 percent. As detailed below, annual returns are backed out of the standard wealth accumulation equation using national data on wealth, labor earnings, household consumption, and government consumption. The Italian national wealth series begins in 2006. Since then, Italy's real return has averaged 4.02 percent.

Figure 3 reports official debt-to-GDP ratios for the two countries dating back to 1960. As indicated, the two countries had roughly the same ratio in the 1960*s* after which Italy's ratio rose dramatically, exceeding 150 percent in 2020. The dramatic rise occurred in the 1980s, doubling from 60 to 120 percent by 1992. Afterwards, Italian debt-to-GDP declined to about 100 percent until the global financial crisis of 2008. Then, as a result of extremely low growth, due to that crisis and the following sovereign-debt crisis, it rose sharply again to about 135 percent where it remains. The official US debt ratio grew rapidly starting in 2000. The CBO projects that official federal debt held by the public, which is currently 102 percent of GDP, will rise,

[5] We extend ISTAT's population projections, which end in 2080, through 2100 by applying post-2080 UN annual more unfavorable population growth rates.

[6] It's only 8 times larger on a PPP basis.

[7] It's only 1.4 times on a PPP basis.

given the OBBBA budget bill, to 228 percent in 2050.[8] In its medium-term structural budget plan, the Italian government projects Italy's 2040 debt-to-GDP ratio at 116 percent of GDP[9], with 125 percent in the least favorable considered scenario.

Table 1: Official Population Statistics

	United States			**Italy**		
	2025	2050	2075	2025	2050	2075
Total population (millions)	349.81	371.52	372.87	58.9	54.8	47.1
Population growth rate (yoy - %)	0.71	0.04	-0.04	-0.05	-0.49	-0.48
Fertility Rate (%)	1.62	1.60	1.59	1.22	1.38	1.45
Net immigration Rate (per 1,000 people)	5.75	3.00	2.99	4.20	3.00	3.50
Life expectancy at Birth (years)	78.92	81.77	84.32	83.5	86.5	87.7
Population Shares (%)						
0–17	0.21	0.18	0.16	0.15	0.13	0.13
18–30	0.17	0.14	0.13	0.13	0.11	0.12
31–59	0.37	0.39	0.36	0.40	0.35	0.33
60+	0.24	0.29	0.34	0.32	0.41	0.42

Sources: CBO and ISTAT

Table 2: UN Population Statistics

	United States			**Italy**		
	2025	2050	2075	2025	2050	2075
Total population (millions)	346.37	380.41	402.44	59.25	52.09	41.80
Population growth rate (yoy - %)	0.52	0.23	0.23	-0.35	-0.75	-0.74
Fertility Rate (%)	1.62	1.64	1.64	1.21	1.35	1.43
Net immigration Rate (per 1,000 people)	3.54	3.35	3.42	1.28	0.83	0.93
Life expectancy at Birth (years)	79.61	83.24	86.38	84.03	87.23	90.06
Population Shares (%)						
0-17	0.21	0.19	0.18	0.15	0.13	0.13
18-30	0.17	0.15	0.15	0.13	0.11	0.12
31-59	0.37	0.36	0.34	0.39	0.33	0.31
60+	0.25	0.29	0.33	0.33	0.43	0.43

Source United Nations

[8]Debt held by the public equals gross debt less Treasury securities held by federal trust funds and other government accounts. This projection comes from a CBO "Alternative Scenario" produced in March 2025 based on an early version of the One Big, Beautiful Budget bill, but one that is close to the final legislation.

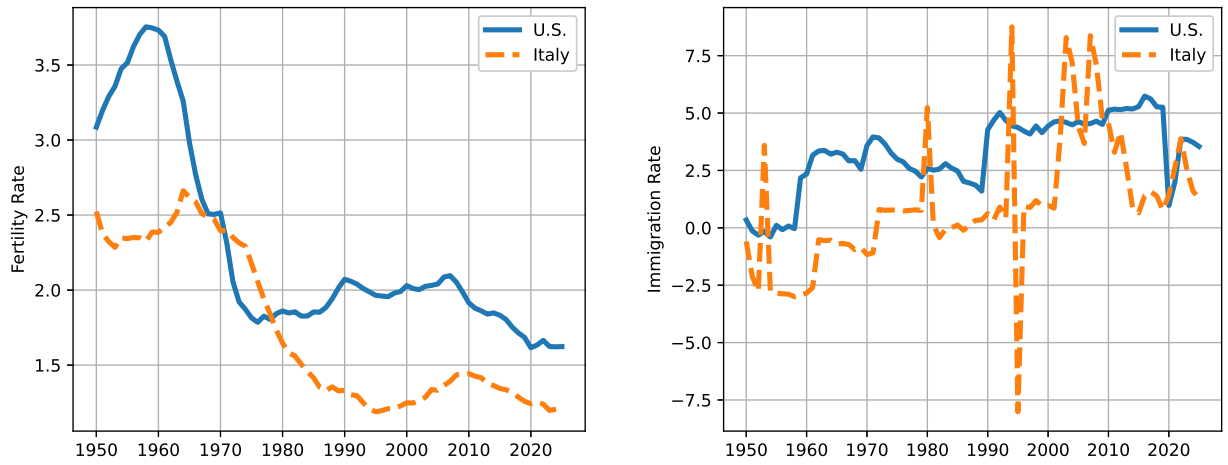
[9]This projection assumes compliance with the primary balance adjustment path through 2031. Thereafter, it adopts a "no-policy-change" scenario, which holds the structural primary balance constant while factoring in the growing fiscal pressures of an aging population, as projected by the European Commission (EC).

Table 3: Macroeconomic Statistics

	United States			Italy		
	2025	2050	2075	2025	2050	2075
RGDP (trillion, 2025 USD-EUR)	29.35	43.58	59.36	2.26	2.63	3.22
RGDP per capita (thousand, 2025 USD-EUR)	83.90	117.30	159.19	38.26	47.93	68.24
	1946-2024	2000-2024		1960-2024	2000-2024	
RGDP growth rate (%)	2.91	2.21		2.50	0.60	
RGDP per capita growth rate (%)	1.76	1.41		2.25	0.44	
	1946-2024	2000-2024		2006-2023	2010-2022	
Avg. real return to nat. wealth (%)	6.02	6.26		4.02	3.49	

Sources: **United States** — RGDP references Real GDP. RGDP and RGDP per capita are from the CBO, "Long-Term Budget Outlook: 2025–2055". Values after 2054 are projected to 2075 by holding per-capita growth constant at the 2054 rate. RGDP Growth rate is calculated using the FRED series for RGDP [GDPCA]. RGDP per capita is calculated using the BEA series [A939RC0A052NBEA] and [A191RD3A086NBEA], retreived from FRED. The computations of the average real return to national wealth are described in section 6. **Italy** — RGDP and RGDP per capita are from the State General Accounting Department, "Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems", September 2024.

Figure 1: US and Italian Fertility and Immigration Rates, 1950-2023

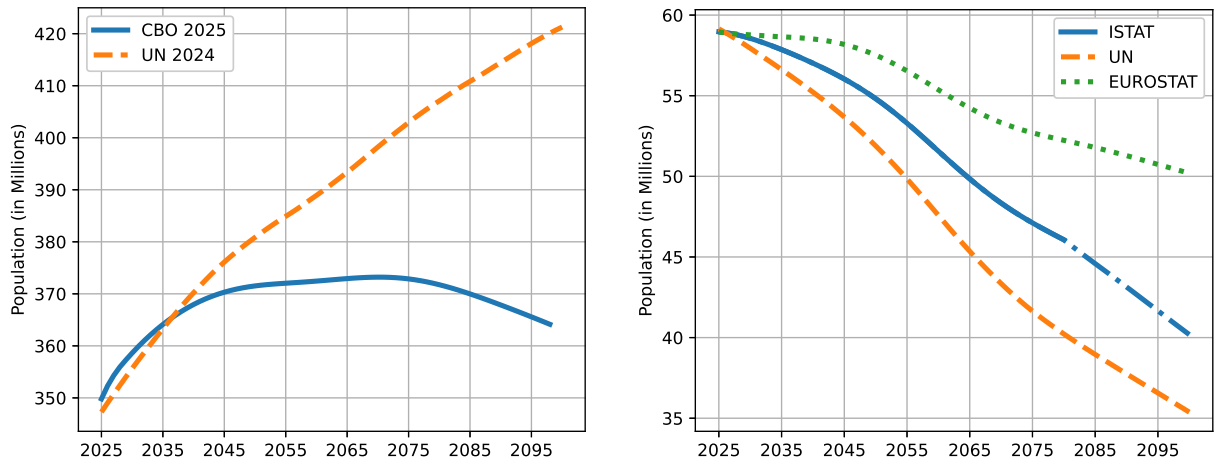


(a) Fertility Rate

(b) Immigration Rate

The left panel plots the annual fertility rate. The right panel plots the annual net migration rate – net migration per 1000 persons. *Source:* United Nations.

Figure 2: US and Italian Population Projections

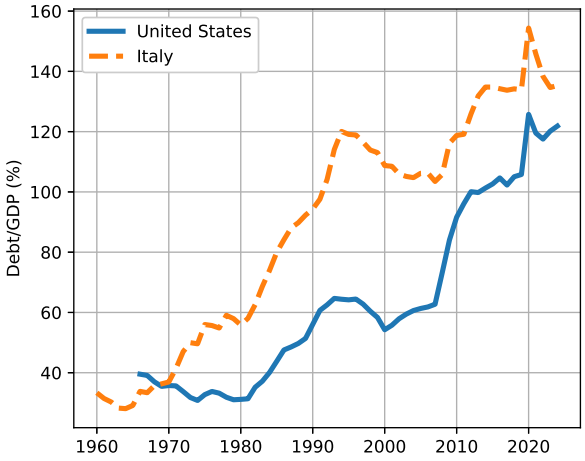


(a) US

(b) Italy

Source: The left panel plots U.S. CBO (solid line) and UN (dashed line) population projections. The right panel plots Italian ISTAT (solid line), UN(dashed line), and Eurostat (dotted line) population projections. We extend ISTAT's population projections, which end in 2080, through 2100 by applying post-2080 UN annual more unfavorable population growth rates.

Figure 3: Public Debt as Percent of GDP



Source: The Federal Reserve, ISTAT, and the Bank of Italy.

4 Fiscal Gap and Generational Accounting.

This section borrows, partially verbatim, from Cardarelli et al. (2000)'s presentation of fiscal gap and generational accounting. In what follows, r_t is the time-t real return to national wealth and g_t is the time-t growth rate of real GDP.

The government's time-t intertemporal budget constraint is given by:

$$\sum_{s=0}^{D} GA_{t,t-s}\, P_{t,t-s} \;+\; \sum_{s=1}^{\infty} \frac{GA_{t,t+s}\, P_{t,t+s}}{(1+r_t)^s} + W_t^g \;=\; \sum_{s=0}^{\infty} \frac{G_{t+s}}{(1+r_t)^s}, \tag{1}$$

where $GA_{t,j}$ is the present value, at time t, of the lifetime net tax payments of individuals born in year j; r_t is the real interest rate at time t; and $P_{t,j}$ is the size, at time t, of the cohort born in year j. When $j > t$, $P_{t,j}$ denotes the projected population at time t of those who will be born in year j. G_t denotes government consumption, and W_t^g is the government's net wealth.[10]

The left-hand side of equation (1) collects the resources the government has available to finance the present value of its consumption. The first term on the left is the sum of the generational accounts of cohorts alive at time t. The second term is the present value, to time t, of the sum of the generational accounts of future cohorts. The third term is the government's time-t net wealth. The constraint requires that the time-t present value of lifetime net tax payments of current and future generations plus government net wealth suffice to pay for the present value of government consumption. In stochastic economies, the government's intertemporal budget holds along each path, i, the economy may traverse through time. In this case, each term in the constraint, including r_t, would be indexed by i. Thus, government fiscal flows are always discounted at the realized path of the return to national wealth.

Using the term "government net wealth" does not imply that the concept is well defined. On the contrary, each internally consistent historic labeling of government outlays and receipts will produce a higher or lower value of government net wealth. But each language-driven change in W_t^g produces an equal and opposite change in the sum of the generational accounts of current generations.[11]

The generational account of a representative in cohort j at time t is defined as

$$GA_{t,j} \;=\; \sum_{s=\max(t,\,k-D)}^{k+D} \frac{P_{s,j}}{P_{t,j}} \frac{T_{s,j}}{(1+r_t)^s} \tag{2}$$

where $T_{s,j}$ is the projected average net payment to the government made in year s by a member of the generation born in year j. A generation's average net payment in year s equals taxes paid (income, payroll, consumption, etc.) minus transfers received (Social Security, welfare, unemployment benefits, etc.). The term $P_{s,j}/P_{t,j}$ indicates the proportion of members of cohort j alive at time t who will also be alive at time

[10] Note that government net wealth can be relabeled as the present value of debt service – payment of principal plus interest. If the assumed discount rate doesn't equal the real rate paid on official debt, the difference can be treated/labeled as a net tax levied on those holding government bonds, which is paid in the year interest is paid. Such relabeling would make no difference to the question fiscal gap accounting answers, namely the immediate and permanent percentage increase (decrease) in non-debt-related taxes (non-interest outlays) needed to close the fiscal gap.

[11] Consequently, like government debt, taxes, total and and average transfer payments, disposable income, personal income, private saving, government saving, and private net wealth, government net wealth is not economically well defined. Indeed, communism and capitalism aren't economically well defined since a) the former features the means of production being "owned" by the state and the latter features the opposite and b) labeling choices can change putative ownership of a nation's wealth as desired. From the perspective of households, alternative labeling conventions will increase (decrease) private net wealth dollar for dollar with the associated decrease (increase) in government net wealth. Moreover, any labeling-based change in any household's net wealth will be associated with an equal and opposite change in that household's generational account leaving the household the same intertemporal consumption capacity. Labeling changes also make no difference to the state-dependent prices households face in making economic choices. In short, as formally shown in Kotlikoff and Green (2009), labeling changes are purely cosmetic.

s. Hence, it represents the probability that a particular member of the year-j cohort who is alive in year t will survive to year s to pay the net taxes levied, on average, in that year on year-k cohort members. For generations born before year t, the summation begins in year t. For generations born in year $j > t$, the summation begins in year j. Regardless of the generation's year of birth, all flows are discounted to year t.

Rearranging equation (1) yields the fiscal gap:

$$\text{fiscal gap}_t \;=\; \sum_{s=0}^{\infty} \frac{G_{t+s}}{(1+r_t)^s} - W_t^g \;-\; \sum_{s=0}^{D} GA_{t,t-s}\, P_{t,t-s} \;-\; \sum_{s=1}^{\infty} \frac{GA_{t,t+s}\, P_{t,t+s}}{(1+r_t)^s} \tag{3}$$

A positive fiscal gap means that the present value of projected taxes minus projected transfers of current and future generations plus government net wealth are insufficient to cover the present value of projected government consumption. If government consumption can't be reduced, immediately or over time, current or future cohorts must pay more, on net, to satisfy the government's intertemporal budget constraint. Generational accounting calculates the lifetime net tax payment $\overline{GA}_t$ required of future generations to eliminate the fiscal gap, assuming that a) current generations' generational accounts – their remaining lifetime net taxes – remain fixed, b) successive future cohorts' lifetime net taxes grow at the economy's rate of labor-productivity growth, g_t, and c) government consumption is not reduced.

$$\sum_{s=1}^{\infty} \overline{GA}_t\, P_{t,t+s}\, \frac{\prod_{j=1}^{s}(1+g_{t+j})}{(1+r_t)^s} \;=\; \sum_{s=0}^{\infty} \frac{G_{t+s}}{(1+r_t)^s} \;+\; W_t^g \;-\; \sum_{s=0}^{D} GA_{t,t-s}\, P_{t,t-s} \tag{4}$$

The comparison between $\overline{GA}_t$ and current newborn's generational account, $GA_{t,0}$, constitutes generational accounting. It provides what may be the most salient measure of a country's fiscal imbalance, namely the size of the lifetime net tax bill facing individuals in future generations if the fiscal gap is left solely for them to resolve. If $\overline{GA}_t$ exceeds $GA_{t,0}$, individuals in future generations are required to contribute more, on a growth-adjusted basis, than current newborns to close the fiscal gap. This said, with sufficiently high productivity or population growth, closing a positive fiscal gap could still leave future generations paying less, on a growth-adjusted basis, than today's newborns. Similarly, with sufficiently low productivity or population growth, closing a negative fiscal gap could still leave future generations paying more, on a growth-adjusted basis, than today's newborns.

5 Theoretical Basis for Discounting at the Real Return to National Wealth

Fiscal sustainability is ultimately a question of economic feasibility. Unsustainable fiscal policy entails the government orchestrating a path of national consumption (government plus private) that exceeds or can be expected to exceed the nation's resources. Countries must live within their means along each path the economy may traverse. This places a limit on fiscal policy, particularly generational policy.

An economy's intertemporal budget constraint is where, to use the American expression, the rubber meets the road. Yes, governments can do many things to alter the future path of their economy.[12] This includes policies that improve economic efficiency, permitting one or more generations to enjoy a higher level of lifetime welfare.[13] Yet, regardless of policy, including efficiency improvements that expand the economy's intertemporal budget, if the government consumes more in the present or arranges for current elderly or other contemporaneous generations to do so, it will reduce investment and, thereby, limit the economy's future consumption opportunities.[14]

This tradeoff will be path dependent with the opportunity cost of increased current consumption, namely, the amount of foregone future consumption, determined by the ensuing, path-specific, cumulative realized real returns on national wealth. Diamond and Mirrlees (1971) showed that the economy's intertemporal budget is the sum of the household sector's and government's intertemporal budget. Kotlikoff (2003) derivation of these constraints makes explicit the state-dependent nature of their arguments. Since a path of the economy references a sequence of period-specific states of nature that differ with respect to the economy's states in at least one future period, the paths are mutually exclusive. Hence, the intertemporal budgets effectively hold for each path the economy may follow. Each government, whether deliberately or not, divides its economy's intertemporal budget between itself and the household sector and does so based on the economy's realized intertemporal terms of trade (path-specific returns to national wealth). Since the future path of these returns is uncertain, we emphasize FGA and GA results based on the historical average real return, but also consider a range of alternative values.

Note that the government's generally safer, if not fully safe borrowing rate plays no direct role in the economy's intertemporal budget, no matter its path. Yet, this rate is routinely used in official fiscal sustainability studies. Unfortunately, since macroeconomic risk is undiversifiable, there is, economically speaking, no aggregate supply of safe assets. This macroeconomic fact of life does not preclude some agents from insuring others, either on their own or via financial-market or government intermediation. Such explicit or implicit markets don't mitigate macro risk. They simply share it. Thus, private agent, A, can directly or indirectly, sell a safe I.O.U. to private agent, B. Since undertaking sure repayment in an unsure economy entails risk, the transaction transfers risk from B to A. As for the issuance and servicing of government bonds, it may be associated with risk sharing, riskless redistribution, or some combination of the two.

As for government borrowing, it may simply be part of an alternative labeling with no economic impact whatsoever. Consider, in this regard, a two-period model in which identical agents work when young and consume when old, each earning either RH or RL, where R references the average return to capital and $H > 1 > L$, on their savings depending on a macro shock. Suppose the government borrows Δ from each

[12] They can consume more or less. They can redistribute across and within generations. They can distort work, saving, and other decisions. They can mitigate or exacerbate a wide range of market failures, including those arising from asymmetric information, moral hazard, market incompleteness, and multiple equilibria. They can facilitate or undermine intergenerational and intragenerational risk sharing. They can provide appropriate or inappropriate levels of public goods. They can support or restrict international trade and investment. And they can encourage or deter technological change.

[13] Kotlikoff et al. (2024) illustrates this point in the context of global carbon taxation.

[14] It may also, as shown in Brumm et al. (2022), limit the set of available efficiency improvements.

young worker promising to pay the safe rate, S, where $RH > S > RL$. Finally, assume the government invests its borrowing and levies a tax on each retired agent of $\Delta(S - RL)$, when the economy's investment return is low and makes a transfer of $\Delta(RH - S)$ to each retired agent when the economy's investment return is high. Once one adds together debt service and the old-age tax or transfer, agents end up, in each state, consuming exactly what they'd otherwise have consumed. The government is, according to this labeling, simply investing on behalf of young agents. This example shows that even a government that does nothing can be described as doing something.

But what if the government's borrowing of Δ is associated with real policy. An example is the government's borrowing of Δ from the young for purposes of immediate consumption. Does the government's ability to repay at the safe rate lower the lifetime net tax burden on the contemporaneous young, assuming they will face the bill? The answer is no. To see this, consider a labeling under which the young pay Δ as a "wage tax." This clearly limits the young's future consumption opportunities. But one can relabel this policy as a loan of Δ when young to the government, a payment to the young when old of ΔS , reflecting principle plus interest, and a tax when old of ΔS. Any distortions of labor supply can be accommodated with the alternative language by simply making the second-period tax a function of first period labor earnings such that, in present value, it collects the same tax revenue and produces identical first-period work disincentives. Predicating current net payments on past work and saving decisions is ubiquitous in the US fiscal system. Social Security's Primary Insurance Amount benefit formula is illustrative. Its formula makes future benefit payments a highly non-linear function of annual past covered earnings.

In short, the fact that the government can borrow, or, indeed, can be said to be borrowing at the economy's risk-free rate doesn't mean that the cost, in terms of foregone future consumption opportunities, of more government or private consumption today is determined by anything other than the ensuing path of returns to national wealth.[15]

Regardless of why the real, risk-free rate is low, some economists, e.g., Blanchard (2019) and Blanchard

[15]An alternative description of government borrowing helps clarify this point. Suppose the government always borrowed on risky terms. For example, suppose it always borrowed shares of stock from the public, called T-Shorts, with repayment in the future equal to principle plus the accumulated return on the borrowed shares. Also, assume the government sold T-Longs – insurance policies guaranteeing a sure return on its T-Shorts. In this foreign-language version of the same economy, no one would think of the government as borrowing at a safe rate. Instead, they would see the government as engaged in selling insurance against adverse macroeconomic conditions with the price of the insurance higher, the higher the likelihood of such conditions. Were the real risk-free return close to the average real return to national wealth, the choice of discount rate would be of little concern. But the opposite is true, particularly for the US. Indeed, the remarkably high US risk premium – the premium for insuring against bad market returns – was famously dubbed the "equity-premium puzzle" by Mehra and Prescott (1985). The size of the premium remains a puzzle insofar as it defies simple resolution, notwithstanding an enormous search for *the* supposedly single, critical missing puzzle piece. Constantinides et al. (2002), Abel (1990), Epstein and Zin (1991), Jermann (1998), Campbell and Cochrane (1999), Campbell (2001), Miao and Ju (2012), and Liu and Miao (2014) posited alternative preferences. Jermann (1998), Tallarini (2000), Boldrin et al. (2001), and Liu and Miao (2014) considered capital frictions. Rietz (1988), Barro (2006), Gabaix (2012), and Wachter (2013) invoke rare disasters. Krueger and Kubler (2006a) introduced significant stochastic depreciation. Farmer (2014) turned to non-fundamental shocks (sunspots). Barberis et al. (2001) resorted to behavioral models, including some based on prospect theory. Uhlig (2007) focus on habit formation and labor-market rigidities. Other economists have asked whether arrangements for pooling macro risk across and within generations are efficient, i.e., whether better risk sharing would lower the insurance premium charged on investment return risk. They've also asked whether government policies, are themselves, either exacerbating or mitigating macroeconomic as well as idiosyncratic risk. Relevant studies here include Bohn (1998), Shiller (1999), Bohn (2001), Diamond and Geanakoplos (2003), Bovenberg et al. (2006), Ball and Mankiw (2007), Gomes et al. (2012), Blanchard (2019), Blanchard and Weil (2001), Brumm et al. (2022), and Brumm et al. (2024).

and Weil (2001), suggest that its tendency to lie well below the growth rate g alters the economy's intertemporal budget frontier, permitting governments to run otherwise fiscally unsustainable policies. The argument harks back to the discussion of dynamic inefficiency and the Golden Rule (see Samuelson (1958), Phelps (1961), Phelps (1965), Diamond (1965)). In deterministic models, an excess of the growth rate, g, over the return to capital, r, signals the government's ability to perpetually redistribute from young to old generations, improving everyone's welfare. Since this redistribution can be arranged under the rubric "deficit policy," deficits can, theoretically, be free up to a point. In neoclassical models, the return to capital rises as capital becomes scarce. Redistributing to contemporaneous elderly from young and future generations, regardless of how such policy is characterized, induces more consumption and, thus, crowds out capital raising r to g making additional redistribution a zero-sum intergenerational game.[16] Hence, efficient deficit policy is limited in scope, i.e., it is inframarginal in terms of the economy's policy-path-dependent intertemporal budget frontier. This means that the economy's intertemporal terms of trade remain determined by realized returns to national wealth.[17] I.e., if we could outgrow debt up to a point, this wouldn't alter, except inframarginally, the decisive determinant of fiscal sustainability, namely the economy's intertemporal budget, no matter its inframarginal expansion.

The world, of course, is anything but deterministic. The same holds for the return to a nation's wealth. Take the postwar variability of the excess real return on the S&P 500. It's roughly three times its mean. Blanchard (2019) suggests that one can assess dynamic inefficiency in stochastic economies by comparing an economy's risk-free real rate with its growth rate. But as Brumm et al. (2022) and Brumm et al. (2024) show, this is not the case. Indeed, governments can engineer very low risk-free rates simply by making their policies uncertain. Blanchard (2019) rests his case on a highly stylized two-period, life-cycle model that substantially raises the potential for efficiency gains from government-arranged intergenerational risk sharing. As Ball and Mankiw (2007) and Brumm et al. (2024) clarify, bidirectional intergenerational redistribution in Blanchard (2019)'s model – transferring from the young to the old in some states of the world and doing the opposite in others – comprises efficient government risk-sharing policy. Yes, unidirectional redistribution, i.e., always taking from the young to give to the old, can, under extreme assumptions, Pareto improve as in Blanchard (2019). But unidirectional redistribution policies are clearly second best and, as shown in Hasanhodzic and Kotlikoff (2024), are far from Pareto-improving in a realistically calibrated, large-scale, stochastic life-cycle model. In short, dynamic stochastic economies can be replete with inefficiencies whose correction by the government can improve the welfare of some generations at no sacrifice to others. Inefficient intergenerational risk sharing, which may be associated with a low safe rate, even one routinely far lower than the growth rate, is one such inefficiency. But such inefficiencies have nothing intrinsically to do with the potential for dynamic inefficiency in deterministic growth models.[18] When such inefficiencies arise, they need to be directly and

[16] In single agent models, correcting dynamic inefficiency would entail increasing all generations' consumption, but still crowd out aggregate capital.

[17] Moreover, the start date of efficient redistribution policy, were such policy feasible, determines, at least in OLG models, how the policy's Pareto gains are distributed across generations as well as potentially precluding particular Pareto improvements (see Brumm et al. (2022)). And returns to national wealth determine the associated generation-specific tradeoffs.

[18] Stated different, one cannot substitute the safe rate, S, for the sure rate r, in assessing dynamic inefficiency in stochastic

properly addressed, not used as a pretext for one-way intergenerational redistribution.

6 Data and Assumptions

This section describes budget data, construction of age-tax and age-transfer profiles, and demographic projections. Projected tax and transfer aggregates, together with their age profiles, are used in constructing 2025 Italian and US generational accounts.[19]

6.1 Fiscal Data and Projections

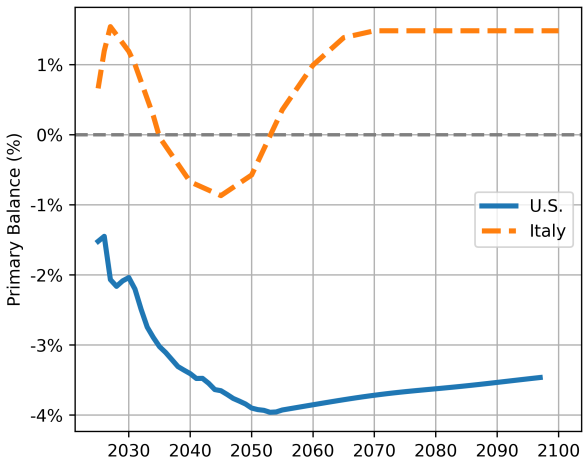
We use the "Net debt, General government, Domestic currency" series from the IMF's World Economic Outlook (WEO) for both US and Italian FGA. In 2024, reported net debt equaled €2.74 trillion for Italy and $28.17 trillion for the US. The CBO and Italian statistical bodies report government receipts and expenditures by type for 2024. They also provide type-specific projections for both receipts and expenditures. In the case of the US, these projections extend through 2054. For Italy, government projections extend through 2027, with separate long-term, age-related expenditure projections through 2070. US 2024 fiscal data come from the Bureau of Economic Analysis (BEA). US fiscal projections are based on a special alternative version of the CBO's March 2025 Long-Term Budget Projection CBO. The version assumes adoption of the original House version of President Trump's Big, Beautiful Budget Bill (Public Law 115-97).[20] As described in the Appendix, we project state government fiscal flows in concert with the CBO's projection. Unfortunately, the CBO's tax projections do not incorporate likely higher US tariff revenue. To incorporate these taxes, we assume tariff receipts will equal 0.8 percent of GDP – an estimate developed by the Tax Foundation. The Appendix details US data sources and procedures for extending CBO's fiscal projections through 2098. Figure 4 plots our projected primary surplus relative to GDP. It is negative at around 1.5% and steadily declines until 2054, reaching negative 4%. After that, it slightly improves, converging to negative 3.5% by the end of our sample.

economies.

[19] Our use of official fiscal data and projections in FGA and GA does not make these data meaningful *in of themselves*. As indicated, any internally consistent relabeling of these data will produce identical FGA and GA results.

[20] See Projections of Deficits and Debt Under Alternative Scenarios for the Budget and Interest Rates.

Figure 4: Projected US and Italian Primary Surpluses



Source: Authors' calculation

Our Italian long-term fiscal projection combines historical data with official short- and long-term government forecasts. Our primary data sources are ISTAT, the Ministry of Economy and Finance (MEF), and the State General Accounting Department (Ragioneria Generale dello Stato, RGS). We use tax revenue and COFOG-classified expenditure data from ISTAT (*Taxes and social contributions by subsector - Government sector* (2025) and *Social benefits by policy area, risk and need - Government sector* (2025)) and incorporate medium-term projections (2025–2027) from the government's Economic and Financial Document (*Documento di finanza pubblica - Sezione II - Analisi e tendenze della finanza pubblica* (2025)). For the main forecast horizon (2028–2070), we adopt the detailed demographic, macroeconomic, and fiscal projections of age-related expenditures from the RGS (*Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024)), where we assume revenues grow at the same rate as GDP (see tables 25 and 26). For the post-2070 period, we assume all fiscal variables grow in line with total GDP, which we project by extrapolating per-capita GDP at its 2070 growth rate and applying official demographic forecasts (see Appendix A.1). This projection implies a dynamic path for the primary balance, shown in figure 4. Italy is forecast to maintain a primary surplus through 2034 followed - absent any policy intervention - by aging-related primary deficits, which are scheduled to peak at 0.9 percent of GDP in 2045. As Italy's aging subsides, and the impact of the pension reforms enacted in the past[21] is completely phased-in, the primary balance gradually recovers, stabilizing at a 1.5 percent of GDP primary surplus in 2055.

This "no policy change" baseline is standard for sustainability analysis, though it is less stringent than the path required by the new EU governance. The Italian government's medium-term structural budget plan (Ministry of Finance (2024)), in compliance with these rules, targets structural primary surpluses of around 3% of GDP from 2030 onward. Because our baseline projection does not assume this level of fiscal consolidation, our resulting fiscal gap estimates for Italy represent a conservative upper bound.

[21] See Appendix A.3.2.

6.2 Relative Age Profiles

Constructing generational accounts requires distributing annual current and future aggregate taxes and expenditures by age. This, in turn, requires tax- and expenditure-specific profiles. We assume profiles are time-invariant except for the age profile of Italian pensions, which are highly year-specific.

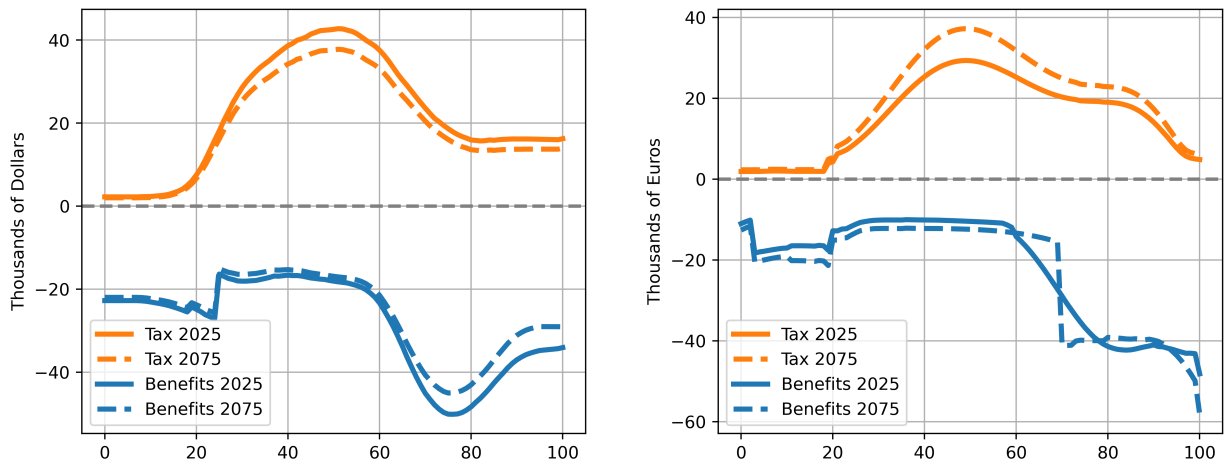
For the US, We use several data sets to construct US relative-age profiles – the Annual Social and Economic Supplement (ASEC) to the 2023 Current Population Survey (CPS), the Consumer Expenditure Surveys (CEX), and the Centers for Medicare & Medicaid Services Statistics Reports (CMS). As detailed in the Appendix A.3.1, the CPS permits construction of separated profiles for federal income taxes, state income taxes, FICA payroll taxes, welfare benefits, Social Security benefits, unemployment benefits, worker's compensation, veterans benefits, and disability benefits. The CEX is used to build age-consumption profiles, which, in turn, are used to produce our age-sales/excise-tax profile. The CMS reports average Medicare and Medicaid outlays by age and sex. Finally, for education, we assume separate uniform age profiles for expenditures on primary education, secondary education, and higher education, and general (non-age-specific) education. Table 21 shows profile assignments for each budget item.

For Italy, we estimate age profiles for taxes and public expenditures using several micro-data sources. For taxes, pensions, and education, we use the Banca d'Italia's tax-benefit microsimulation model, BIMic (Curci et al. (2017)), applied to the 2022 wave of the Survey on Household Income and Wealth (SHIW, Bank of Italy (2024)). Age profiles for public healthcare consumption are derived from Italy's European Health Interview Survey (EHIS), provided by ISTAT (*European Health Interview Survey (EHIS)* (2015)). We constructed a detailed microsimulation model to capture, through profiles, the evolution of the generosity of old-age pensions of different cohorts over our projection horizon. This model accounts for the transition dynamics of Italy's major legislated pension reforms. The resulting 21 age-tax and age-expenditure profiles are listed in tables 22 and 23. Full details on their construction are provided in Appendix A.1. Our use of the 2022 SHIW as a baseline is supported by the findings of Dicarlo (2021). They show that these age profiles have been broadly stable over the past decade based on the 2014 and 2016 waves. Figure 5 shows, for 2025 and 2075, average taxes paid and transfer benefits received (measured as negative values) by age scaled by projected 2025 and 2075 values of GDP. The US and Italian profiles show noticeable differences through time. Interestingly, scaled average taxes are lower in 2075 than 2025 in the US starting around age 30. The reverse is true for Italy. As for the average age-benefit profile, it's higher after age 60 in the US and smoother after 60 in Italy. These findings reflect both demographics, productivity growth, and Italy's evolving pension system.

6.3 Demographic Projections and other Data

We need annual projected population counts by age to construct values $P_{s,k}$ in equation 2. For the US, we use the 2025 CBO's "Demographic Outlook: 2025 to 2055", which provides these population estimates

Figure 5: Average Tax and Benefits by Age



(a) U.S.

(b) Italy

through 2098. We assume constant age-sex population counts thereafter. For Italy, our annual demographic projections, shown in figure 2b, are taken from ISTAT through 2080 (Istat (2025)). These projections are consistent with the RGS's long-term expenditure forecasts, ensuring coherence between the demographic and fiscal assumptions. For the years 2081 to 2100, we extrapolate the population using age- and sex-specific growth rates from the UN World Population Prospects. Beyond 2100, we hold the population constant at its 2100 level in both size and structure. Section 5.1 tests the sensitivity of our results to this baseline assumption base on two alternative projections: one from the RGS's aging scenario consistent with the European Commission methodology (2024 Aging Report), which is based on 2023 demographics projections Eurostat (2024), and another based entirely on UN forecasts.

Calculating Returns on National Net Wealth The rate of return on national wealth is derived from the standard equation for wealth accumulation, where the change in wealth between periods t and $t+1$ equals national saving – the return on existing wealth at time t, W_t, plus the difference between national labor income, E_t and national consumption, both household, C_t and government, G_t:

$$W_{t+1} - W_t = (E_t - C_t - G_t) + r_t W_t \tag{5}$$

Solving for r_t we obtain a formula one can use to compute the rate of return on national wealth

$$r_t = \frac{(W_{t+1} - W_t) - (E_t - C_t - G_t)}{W_t}. \tag{6}$$

We use annual nominal data for each of these variables to solve for r_t. The nominal return is adjusted for inflation using each nation's consumer price index. Appendix A.4 provides more details for the data sources.

Lifetime Labor Income: Projections are discounted using the real discount rate and age-specific mortality rates. For the US, labor income is defined as the sum of non-farm business income, farm income, and wages and salaries[22]. For employee compensation, we use the value $12 401.1 trillion from BEA Table 2.1, "Personal Income and Its Disposition". For Italy, we rely on the distribution of labor income (analogously defined as for the US) from the internal microsimulation model which matches the distribution of income reported in the official tax declarations. Mortality rates for both countries are taken from the *UN World Population Prospects 2024*. Lifetime labor income is computed as the expected present value of future earnings for a newborn. To project these earnings, we apply the most recent age–earnings profile, rescale it to match the 2024 employee compensation amount from budgetary data, and grow it at the rate of real GDP per capita.

7 Results: Fiscal Gap Accounting

Tables 4 and 5 report our FGA results for Italy and the US. At our preferred 4 discount rate for Italy and 6 percent discount rate for the US, the Italian fiscal gap is 3.99 percent – far below US 7.42 percent gap. Moreover, the requisite Italian adjustments needed to eliminate its fiscal gap – a 7.4 percent immediate and permanent non-interest spending cut or a 7.3 immediate and permanent increase in taxes – are far more manageable than closing the US gap. Doing so requires either an immediate and permanent 23.9 percent non-interest spending cut or a 26.5 percent immediate and permanent tax increase.

The tables are remarkable for another reason. In Italy, the fiscal gap is actually smaller than official debt. Discounting at 4 percent, the Italian fiscal gap is $2.34 trillion, whereas Italian official net debt is $2.74 trillion. The US fiscal gap, discounted at 6 percent, is larger than official debt. It's $48.73 trillion compared to official debt of $28.17 trillion.

Italy clearly puts more of its obligations on the books and keeps less off the books. The US does very much the opposite. At a 2 percent discount rate, the Italian fiscal gap is very small – 0.72 percent. In contrast, the US gap remains quite high – at 4.25 percent. Based on an 8 percent discount rate, both countries have roughly 10 percent fiscal gaps.

Tables 6 and 7 show the cost of delay in closing the fiscal gap. The tables are based on our baseline discount rates. Waiting for a quarter century to start permanently cutting spending or raising taxes leads to roughly a doubling of the required Italian fiscal adjustments and a more than tripling of the required US fiscal adjustments.

[22] This corresponds to the sum of the CPS series INCBUS, INCFARM, and INCWAGE.

Table 4: Italy Fiscal Gap

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	0.72%	2.40%	3.99%	5.51%	6.98%	8.42%	9.83%
Required Decrease in Spending	1.4%	4.5%	7.4%	10.2%	12.9%	15.6%	18.2%
Required Increase in Taxes	1.3%	4.4%	7.3%	10.1%	12.8%	15.4%	18.0%
PV Net Transfers	1.66	0.71	0.40	0.26	0.20	0.16	0.14
Gov. Net Wealth	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74
Fiscal Gap	1.08	2.03	2.34	2.48	2.55	2.58	2.60
PV Real GDP	150.45	84.62	58.79	45.03	36.49	30.68	26.48

Note: Trillions of euros. PV references present value.

We assume GDP per capita grows at 1.31% in the long run, and Real GDP at 0.7%.

Table 5: US Fiscal Gap

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	4.25%	5.02%	5.81%	6.61%	7.42%	8.24%	10.45%
Required Decrease in Spending	13.5%	16.0%	18.6%	21.2%	23.9%	26.6%	29.3%
Required Increase in Taxes	15.2%	18.0%	20.8%	23.6%	26.5%	29.4%	32.4%
PV Net Transfers	-132.11	-60.13	-37.76	-26.91	-20.56	-16.42	-13.53
Gov. Net Wealth	-28.17	-28.17	-28.17	-28.17	-28.17	-28.17	-28.17
Fiscal Gap	160.28	88.31	65.93	55.08	48.73	44.59	41.71
PV Real GDP	3772.93	1757.37	1134.25	833.11	656.54	540.88	399.04

Note: Trillions of dollars. PV references present value.

We assume GDP per capita grows at 1.23% in the long run, and Real GDP at 1.10%.

Table 6: Delayed Adjustments, Italy

Real Interest Rate	2025	2030	2040	2050
Required Decrease in Spending	7.4%	8.7%	12.1%	16.8%
Required Increase in Taxes	7.3%	8.6%	11.9%	16.4%

Note: Assumes 4% discounting.

Table 7: Delayed Adjustments, US

Real Interest Rate	2025	2030	2040	2050
Required Decrease in Spending	23.9%	29.4%	45.7%	72.1%
Required Increase in Taxes	26.5%	33.0%	51.9%	82.0%

Note: Assumes 6% discounting.

8 Results: Generation Accounting

The first rows of tables 8 and 9 show lifetime net tax rates of current newborns – zero-year-olds – in the two countries. GA(0) references the present expected (based on survival) value of lifetime net taxes – the generational accounts – of current zero-year-olds, i.e., those born in 2025. Lifetime Labor Income (0) is their corresponding present expected values of lifetime labor earnings.

GA(-1) and Lifetime Labor Income (-1) are the generational accounts of those born next year, i.e., in 2026. As indicated above, GA(-1) is computed such that a) all individuals in generations born after generation -1 make the same lifetime net tax payment (have the same generational account) apart from an adjustment for growth, and b) the present value, back to the current year, of the generational accounts of those born next year and beyond suffices to close the fiscal gap.

Tables 8 and 9 tell the same generational accounting story for both countries. Neither can afford to leave their fiscal gaps for future generations to pay. Doing so, at least based on economically appropriate discounting, entails levying lifetime net tax rates above 100 percent. This is clearly infeasible.

For Italy, with its long-term declining labor force and low labor-productivity growth rate, the 4 percent fiscal-gap-eliminating lifetime tax rate on current newborns is 42 percent. If future Italians are faced with the full fiscal gap, the required tax rate is 104 percent. For American newborns, the 6 percent tax rate is actually negative 54.6 percent. This reflects the substantial value of educational transfers early in life. The rate flips to positive 104.2 percent for future Americans assuming, again, that current generations make no contribution to reducing the US fiscal gap.

Table 8: Generational Accounting, Italy

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	52.7%	49.2%	42.0%	31.3%	17.1%	-1.0%	-22.5%
GA(-1) / Lifetime Labor Income (-1)	73.1%	83.0%	104.0%	143.6%	213%	327.6%	510.4%
Ga(0)	476.18	292.19	166.79	84.51	31.81	-1.26	-20.84
Ga(-1)	664.76	495.91	415.53	390.27	399.53	430.51	476.61
Lifetime Labor Income (0)	902.93	593.61	396.95	269.81	186.27	130.51	92.73
Lifetime Labor Income (-1)	909.25	597.76	399.73	271.70	187.58	131.43	93.38

Note: Amounts in thousands of euros. GA(0) and G(-1) reference lifetime net taxes of 2025 and 2026 newborns, respectively. We assume GDP per capita grows at 1.31% in the long run, and Real GDP at 0.7%.

Table 9: Generational Accounting, US

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	-12.9%	-17.1%	-25.4%	-37.8%	-54.6%	-76.2%	-103.1%
GA(-1) / Lifetime Labor Income (-1)	9.1%	20.3%	36.6%	62.5%	104.2%	170.1%	271%
Ga(0)	-257.71	-223.05	-220.49	-223.28	-223.43	-219.67	-212.75
Ga(-1)	183.10	268.11	321.42	373.27	431.23	495.77	565.46
Lifetime Labor Income (0)	1997.83	1303.73	868.97	590.80	409.18	288.31	206.40
Lifetime Labor Income (-1)	2025.20	1321.59	880.88	598.90	414.79	292.26	209.23

Note: Amounts in thousands of dollars. GA(0) and G(-1) reference lifetime net taxes of 2025 and 2026 newborns, respectively. We assume GDP per capita grows at 1.23% in the long run, and Real GDP at 1.10%.

9 Can a 20% Discretionary Spending Cut Achieve Fiscal Balance?

In its Fall 2024 conception, the putative aim of the first US Department of Government Efficiency (DOGE) pledged was to shrink US federal government spending by approximately one-third and the federal government workforce by 75 percent. Seven months later, these goals were dramatically curtailed to cutting less than 3 percent of federal spending and eliminating 12 percent of federal employment.

General federal government spending, called Discretionary Spending by Congress, comprises only one quarter of federal government outlays and only one eight of total (federal plus state and local) government expenditures. Italy's budgetary framework doesn't have a formal category equivalent to US "Discretionary Spending". However, we can construct a comparable metric by considering total government outlays net of spending on major social entitlements, primarily pensions, healthcare, and education. Such non-entitlement spending constitutes approximately 44% of total government expenditures in Italy.

Tables 10 through 13 explore the impacts on Italian and US FGA and GA of immediately and permanently lowering US discretionary spending or the approximate Italian equivalent by 20 percent. The Italian fiscal gap, based on 4-percent discounting, falls from 3.99 percent to 2.50 percent of annual GDP. The US 6-percent discount-rate gap decreases from 7.42 percent to 5.72 percent. These are important reductions, but they clearly leave major fiscal gaps in place. For Italy and the US, eliminating their remaining fiscal gaps require respective 4.6 percent and 21.9 percent immediate and permanent increases in *all* taxes, i.e., each country's annual projected path of tax receipts must rise by these percentages. Leaving future generations to handle the remaining fiscal gap remains infeasible as tables 12 and 13 show. Despite the posited 20 percent reduction in discretionary spending, the lifetime net tax rate on those born in 2026 and thereafter needed to achieve intertemporal budget balance, on their own, is 84.2 percent in Italy and 81.1 percent in the US.

Table 10: Fiscal Gap, Italy: 20% Percent Reduction in Discretionary Spending

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	-0.70%	0.95%	2.50%	3.99%	5.43%	6.84%	8.23%
Required Decrease in Spending	-1.4%	2.0%	4.8%	7.6%	10.4%	13.0%	15.7%
Required Increase in Taxes	-1.3%	2.0%	4.6%	7.3%	10.0%	12.5%	15.1%
PV Net Transfers	3.79	1.94	1.27	0.95	0.76	0.64	0.56
Gov. Net Wealth	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74
Fiscal Gap	-1.05	0.80	1.47	1.80	1.98	2.10	2.18
PV Real GDP	150.45	84.62	58.79	45.03	36.49	30.68	26.48

Note: Trillions of euros. PV references present value.

We assume GDP per capita grows at 1.31% in the long run, and Real GDP at 0.7%.

Table 11: Fiscal Gap, US: 20% Percent Reduction in Discretionary Spending

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	2.87%	3.57%	4.27%	4.99%	5.72%	6.46%	8.31%
Required Decrease in Spending	9.8%	12.4%	15.1%	17.8%	20.6%	23.5%	26.4%
Required Increase in Taxes	10.6%	13.4%	16.2%	19.0%	21.9%	24.9%	27.9%
PV Net Transfers	-82.17	-36.63	-22.41	-15.53	-11.51	-8.92	-7.13
Gov. Net Wealth	-26.05	-26.05	-26.05	-26.05	-26.05	-26.05	-26.05
Fiscal Gap	108.22	62.67	48.46	41.57	37.56	34.96	33.17
PV Real GDP	3772.93	1757.37	1134.25	833.11	656.54	540.88	399.04

Note: Trillions of dollars. PV references present value.

We assume GDP per capita grows at 1.23% in the long run, and Real GDP at 1.10%.

Table 12: Generational Accounting, Italy: 20% Reduction in Discretionary Spending

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	52.7%	49.2%	42.0%	31.3%	17.1%	-1.0%	-23.2%
GA(-1) / Lifetime Labor Income (-1)	64.0%	69.6%	84.2%	114.7%	171.0%	267.2%	423.2%
Ga(0)	476.18	292.19	166.79	84.51	31.81	-1.26	-21.53
Ga(-1)	581.94	415.79	336.58	311.64	320.71	351.19	395.20
Lifetime Labor Income (0)	902.93	593.61	396.95	269.81	186.27	130.51	92.73
Lifetime Labor Income (-1)	909.25	597.76	399.73	271.70	187.58	131.43	93.38

Note: Amounts in thousands of euros. GA(0) and G(-1) reference lifetime net taxes of 2025 and 2026 newborns, respectively.

We assume GDP per capita grows at 1.31% in the long run, and Real GDP at 0.7%.

Table 13: Generational Accounting, US: 20% Reduction in Discretionary Spending

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	-8.7%	-12.7%	-20.4%	-32.1%	-47.9%	-68.2%	-93.4%
GA(-1) / Lifetime Labor Income (-1)	6.9%	15.1%	27.1%	47.3%	81.1%	136.2%	222.6%
Ga(0)	-174.66	-165.30	-177.59	-189.66	-195.97	-196.50	-192.74
Ga(-1)	138.63	198.51	238.44	282.54	335.70	397.06	464.54
Lifetime Labor Income (0)	1997.83	1303.73	868.97	590.80	409.18	288.31	206.40
Lifetime Labor Income (-1)	2025.20	1321.59	880.88	598.90	414.79	292.26	209.23

Note: Amounts in thousands of dollars. GA(0) and G(-1) reference lifetime net taxes of 2025 and 2026 newborns, respectively.

We assume GDP per capita grows at 1.23% in the long run, and Real GDP at 1.10%.

10 Sensitivity to Demographic Projections

How important are the differences in the UN's demographic projections to FGA and GA? Recall that the UN projects very different population totals over time. In 2075, the UN is forecasting 402 million Americans, which is 8 percent higher than the CBO forecasts. In contrast, the UN foresees a larger decline in the Italian population between now and 2075, from 59 million now to 42 million. ISTAT projects a drop to 47 million. Hence, the Italian government is predicting a 20 percent decline whereas the UN is forecasting a 29 percent decline.

To provide apples-to-apples comparisons of FGA and GA based on different demographics, we hold fixed per-capita fiscal treatment of each age cohort, as determined in the baseline, while altering the population size of each cohort according to the UN forecast. Specifically, for each projected year and for each fiscal category (e.g., pension spending), we use our baseline age-profiles and population data to calculate the average per-capita tax or transfer amount for each age group. We then multiply, for each future year, this age-specific per-capita value by the number of individuals in the corresponding age group in the UN's demographic projection. Summing these amounts across all age groups yields the new annual values of aggregate expenditures and taxes. The GDP path is adjusted analogously. We hold GDP per capita constant at the level of the final forecast year from the baseline scenario and multiply it by the UN's projected population to generate a new GDP series.

Italian old-age pension spending requires different treatment due to legislated structural changes to its pension system. Specifically, we assume that total old-age pension expenditures remains a constant share of GDP, identical to the ratio projected in our baseline scenario. This choice is motivated by the automatic stabilizers embedded in Italy's Notional Defined Contribution (NDC) pension system, which ensure that outlays are intrinsically linked to macroeconomic and demographic conditions. Specifically, the NDC system's key stabilizers include the revaluation of accrued pension wealth based on nominal GDP growth, the calculation of initial benefits using "transformation coefficients" (*coefficienti di trasformazione*) that are an actuarial function of life expectancy at retirement, and the automatic indexation of the statutory retirement age to changes in average life expectancy. Holding this ratio constant across scenarios is, therefore, more realistic than assuming a fixed per-capita transfer.[23]

Tables 14 through 17 present UN-demographic-based FGA and GA analyses. Compared to official demographic projections, FGA produces a larger fiscal gap for Italy but a smaller fiscal gap for the US at all discount rates. For Italy, discounting at 4 percent produces a 4.95 percent fiscal gap compared with 3.99 incorporating official demographic projections. The 2 percent fiscal gap is now 2.00 percent, not 0.72 percent. The US fiscal gap is slightly lower for high discount rates. At 6 percent, it is now 6.94 percent rather than 7.42 percent. At lower discount rates, it's significantly smaller, namely 2.92 percent rather than 4.25 percent. Pinning down the precise sources of these differences is difficult. But the UN's projected slower

[23] We show results relaxing this assumption in Appendix A.2

population growth in the Italian workforce means less future tax revenues relative to benefit payments. And the UN's projected faster US population growth spells relatively higher GDP. It's discounted present value is, of course, far higher based on a 2 percent rather than a 6 percent discount rate.

Tables 16 and 17 consider GA based on UN demographics. As a comparison of tables 8 and 16 shows, Italian GA is essentially unaffected by switching to the UN forecasts. For example, applying a 4 percent discount rate, future Italians face a 104 percent lifetime net tax rate assuming official demographic forecasts. This figure is 108 percent based on the UN forecast. Automatic stabilizers are essential to the sustainability of Italy's pension system. Lacking these, the figure would rise to 125 (see table 29 and table 30). In contrast, US GA now looks significantly better, although far too high to transform giving current generations a fiscal pass into a feasible policy option. The table 9 lifetime tax rate facing future Americans was 104 percent. With UN demographics, its lower, namely 87 percent. Of course, trying to collect such as high average lifetime net tax would entail confiscatory marginal taxation that would dramatically lower Americans' labor supply and saving if not lead to wholesale emigration from the country.

Table 14: Fiscal Gap, Italy: UN Demographic Projections

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	2.00%	3.50%	4.95%	6.36%	7.74%	9.10%	10.46%
Required Decrease in Spending	3.7%	6.4%	9.1%	11.7%	14.2%	16.7%	19.2%
Required Increase in Taxes	3.7%	6.4%	9.1%	11.7%	14.2%	16.7%	19.2%
PV Net Transfers	0.13	0.02	0.00	0.01	0.02	0.03	0.05
Gov. Net Wealth	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74
Fiscal Gap	2.62	2.72	2.74	2.73	2.72	2.71	2.70
PV Real GDP	130.71	77.84	55.39	43.01	35.16	29.75	25.79

Note: Trillions of euros. PV references present value.

We assume GDP per capita grows at 1.31% in the long run, leading to a GDP growth of 0.5%.

Table 15: Fiscal Gap, US: UN Demographic Projections

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	2.92%	4.13%	5.15%	6.06%	6.94%	7.80%	10.01%
Required Decrease in Spending	10.6%	14.3%	17.4%	20.2%	23.0%	25.9%	28.7%
Required Increase in Taxes	11.7%	15.8%	19.2%	22.4%	25.4%	28.4%	31.5%
PV Net Transfers	-123.62	-53.79	-34.30	-24.64	-18.85	-15.03	-12.36
Gov. Net Wealth	-28.17	-28.17	-28.17	-28.17	-28.17	-28.17	-28.17
Fiscal Gap	151.80	81.96	62.47	52.81	47.03	43.21	40.54
PV Real GDP	5192.22	1982.25	1213.98	871.01	677.60	553.79	404.87

Note: Trillions of dollars. PV references present value.

We assume GDP per capita grows at 1.23% in the long run leading to a GDP growth of 1.37%.

Table 16: Generational Accounting, Italy: UN population

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	43.6%	40.2%	33.3%	23.0%	9.1%	-8.4%	-30.2%
GA(-1) / Lifetime Labor Income (-1)	71.1%	83.5%	107.7%	151.7%	226.7%	348.7%	539.9%
Ga(0)	393.62	238.82	132.21	61.98	17.04	-11.01	-28.01
Ga(-1)	642.02	495.62	427.60	409.21	422.20	455.08	500.65
Lifetime Labor Income (0)	902.93	593.61	396.95	269.81	186.27	130.51	92.73
Lifetime Labor Income (-1)	907.44	596.57	398.93	271.16	187.20	131.17	93.19

Note: Dollar amounts (GA(·) and NPV entries) are in thousands of dollars.

We assume GDP per capita grows at 1.31% in the long run, leading to a GDP growth of 0.5%.

Table 17: Generational Accounting, USA: UN population

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	-9.9%	-14.0%	-22.1%	-34.3%	-51.0%	-72.4%	-99.2%
GA(-1) / Lifetime Labor Income (-1)	5.0%	14.4%	28.1%	50.4%	87.0%	145.8%	237.3%
Ga(0)	-198.49	-182.01	-191.79	-202.92	-208.74	-208.87	-204.67
Ga(-1)	102.03	190.55	247.86	301.82	360.81	426.06	496.58
Lifetime Labor Income (0)	1997.83	1303.73	868.97	590.80	409.18	288.31	206.40
Lifetime Labor Income (-1)	2025.20	1321.59	880.88	598.90	414.79	292.26	209.23

Note: Amounts are in thousands of dollars.

We assume GDP per capita grows at 1.23% in the long run leading to a GDP growth of 1.37%.

10.1 Sensitivity to the European Commission Italian Fiscal Scenario

We next consider an alternative fiscal scenario based on the harmonized Economic Policy Committee Working Group on Aging (EPC-WGA) forecast. This scenario is designed for EU-wide comparability and assumes more favorable demographic and economic trends. Under these assumptions, Italy's fiscal outlook improves significantly. The projected primary deficit is smaller and shorter lived, and the long-term primary surplus stabilizes at a higher level of GDP – approximately 2.4%, compared with 1.5% in our baseline. (Appendix A.2 provides scenario assumptions.)

Italy's fiscal gap using 4 percent discounting is 2.76 percent compared with 3.99 percent in our baseline. And at a 2 percent discount rate, Italy's fiscal gap is negative based on the European Commission's projections – −0.99, not 0.72 percent. These fiscal gaps remain, however, too high for resolution by future generations alone. GA based on 4% discounting implies a 103.5% lifetime tax rate for future Italians. With 2% discounting, the tax rate is 72.8%.

Table 18: Fiscal Gap, Italy: EPC-WGA forecast

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	-0.99%	0.95%	2.76%	4.46%	6.08%	7.65%	7.65%
Required Decrease in Spending	-1.9%	1.8%	5.2%	8.4%	11.4%	14.3%	14.3%
Required Increase in Taxes	-1.9%	1.8%	5.1%	8.2%	11.2%	14.0%	14.0%
PV Net Transfers	4.97	1.79	0.97	0.62	0.44	0.34	0.34
Gov. Net Wealth	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74	-2.74
Fiscal Gap	-2.22	0.95	1.78	2.13	2.30	2.41	2.41
PV Real GDP	223.94	99.81	64.40	47.64	37.87	31.46	31.46

Note: Trillions of euros. PV references present value.

We assume GDP per capita grows at 1.43% in the long run leading to a GDP growth of 1.2%.

Table 19: Generational Accounting, Italy: EPC-WGA forecast

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	63.1%	60.4%	53.5%	42.9%	28.7%	10.6%	14.9%
GA(-1) / Lifetime Labor Income (-1)	72.8%	82.6%	103.5%	143.1%	212.2%	326.3%	459.2%
Ga(0)	570.20	358.61	212.51	115.82	53.40	13.83	13.83
Ga(-1)	664.76	495.91	415.53	390.27	399.53	430.51	430.51
Lifetime Labor Income (0)	902.93	593.61	396.95	269.81	186.27	130.51	92.73
Lifetime Labor Income (-1)	912.86	600.14	401.31	272.78	188.32	131.95	93.75

Note: Euro amounts (GA(·) and NPV entries) are in thousands of euros.

We assume GDP per capita grows at 1.43% in the long run leading to a GDP growth of 1.2%.

11 Conclusion

Economic theory provides clear guidance for measuring a nation's fiscal solvency. The answer, in a nut shell, is to consider the big picture – all aspects of policy. Unfortunately, the standard measure of fiscal sustainability – official debt – leaves off the books whatever a government wishes to label as unofficial. This renders a country's reported debt economically arbitrary and its use a semantic argument, not a means to discern a country's true fiscal condition. Fiscal gap and generational accounting are, in contrast, label-free measures of fiscal health. The reason is simple. They incorporate all fiscal receipts and payments no matter their official designations.

FGA and GA provide a solid baseline for assessing whether a country can, over time, afford what its government spends. However, methodologies fail to capture general equilibrium feedback effects, including work and saving responses to fiscal policy, macro- and micro-shocks, and a range of other real-world factors. Macroeconomists are developing large-scale stochastic OLG models that incorporate the entire gamut of fiscal policies. Although still in their infancy, they do indicate that FGA and GA provide a lower bound on the damage fiscally profligate current generations are inflicting on future generations.

This study compares the fiscal solvency of the US and Italy according to FGA and GA. Its findings are striking. Notwithstanding its higher official debt-to-GDP ratio, Italy has a smaller fiscal gap than does the US where the gap is measured as the permanent annual share of GDP needed to achieve intertemporal government budget balance. This said, neither country is running sustainable fiscal policy if one properly discounts future government cash flows at the return to national wealth – a country's fundamental intertemporal terms of trade. This, not the generally far lower return to government bonds, which reflects the cost of insuring against macro-return risk, conveys the true cost to future generations of current fiscal excess.

Eliminating the US fiscal gap requires either an immediate and permanent 26.5 percent higher path of tax receipts or an immediate and permanent 23.9 percent lower path of non-interest spending. For Italy, the 4.0 percent discount rate tax and spending adjustments are 7.3 percent and 7.4 percent, respectively. If one discounts at a 2 percent real return – roughly the real rate now being paid on countries' governments' ten-year Treasuries, the US fiscal gap is 4.25 percent of GDP and the Italian Gap is 0.72 percent of GDP. In this case, the requisite fiscal balance adjustments for the US are roughly half as large and those for Italy are trivially small.

But based on economically appropriate discounting, neither country can leave future generations to cover their government's red ink. Doing so requires levying lifetime net tax rates – lifetime net taxes divided by lifetime labor earnings – above 100 percent on both future Americans and future Italians. For the US, this hypothetical confiscatory tax burden reflects the magnitude of its fiscal imbalance. For Italy, it reflects the dearth of future Italian workers of sufficiently high productivity to cover the costs of Italy's smaller percent-of-GDP fiscal gap.

Even a massive 20 percent reduction in US and Italian government discretionary spending would fail to

immunize future American and Italian children from a future of confiscatory net taxation – paying virtually every penny they earn in net taxes – if current generations were to pay no more or accept no less than current policy mandates. As for alternative demographic outcomes, the UN's projection provides a bleaker picture for Italy and an only slightly improved picture for the US. Finally, delaying fiscal adjustment until, say, the middle of the century comes at a major price. The requisite Italian permanent tax hikes or spending cuts starting in 2050 are roughly twice as large. For the US, they are roughly three times as large.

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A Appendix: Data and Assumptions

This appendix provides the technical foundation for our analysis. It details the data sources, projection methodologies, and construction of age-specific fiscal profiles for both the United States and Italy. Furthermore, it outlines the assumptions behind the alternative scenarios used for robustness checks and describes the calculation of the real return on national wealth.

A.1 Data, Projections, and Methods

US Data for 2024 US government receipts and expenditures are those reported by Bureau of Economic Analysis (BEA), specifically "Table 3.1. Government Current Receipts and Expenditures". To split personal current taxes into federal versus state & local components, we draw on: "Table 3.2. Federal Government Current Receipts and Expenditures" and "Table 3.3. State and Local Government Current Receipts and Expenditures". Because 2024 data by function are not yet available, we take the 2023 data "Table 3.16. Government Current Expenditures by Function" and assume the 2023 share of spending devoted to education is unchanged in 2024. Similarly, we apply the 2023 breakdown into "elementary and secondary", "higher", and "libraries and other" to allocate 2024 education spending. We further disaggregate "government social benefits to persons" using "Table 3.12. Government Social Benefits". As the most recent detail is for 2023, we carry those 2023 shares forward to allocate the 2024 benefits. We assume higher tax revenues to account for tariff. According to the estimate of the Tax Foundation, we project a raise tax revenues equal to 0.8 percent of GDP. The March 2025 CBO Long-Term Budget Projections from CBO provides estimates for spending and revenues from 2025 until 2055 as a share of GDP. We supplement this with the 2024 values from the January 2025 projections. Given CBO's baseline projections of deficits and debt reflect the scheduled expiration of certain provisions of the 2017 tax act (Public Law 115-97) under current law, we use the values from Projections of Deficits and Debt Under Alternative Scenarios for the Budget and Interest Rates which simulate the scenario in which all provisions of that act were extended permanently. Specifically, we use the revenues series from Alternative Scenario 2. Given the projections, we compute the growth rates until 2055. We assume the shares remain constant after that year.

Table 20: CBO Projections

	Revenues Alternative scenario	Social Security	Medicare,	Medicaid, CHIP, Marketplace	Other mandatory	Discretionary spending	Total non-interest spending
2024	17.1	5.0	3.2	2.6	3.2	6.3	20.4
2025	17.2	5.2	3.1	2.7	3.0	6.1	20.2
2026	17.2	5.3	3.2	2.7	2.8	6.1	20.0
2027	16.9	5.4	3.3	2.7	2.8	6.0	20.1
2028	16.8	5.5	3.3	2.7	2.5	5.9	20.0
2029	17.1	5.6	3.4	2.7	2.7	5.8	20.2
2030	17.1	5.7	3.5	2.7	2.6	5.7	20.2
2031	17.1	5.8	3.6	2.7	2.6	5.6	20.2
2032	17.0	5.8	3.7	2.7	2.5	5.5	20.3
2033	16.9	5.9	3.8	2.7	2.5	5.5	20.3
2034	16.9	5.9	3.9	2.7	2.4	5.4	20.3
2035	16.9	6.0	4.0	2.7	2.4	5.3	20.4
2036	16.9	6.0	4.1	2.7	2.4	5.2	20.4
2037	16.8	6.0	4.2	2.7	2.3	5.2	20.4
2038	16.8	6.0	4.3	2.8	2.3	5.1	20.4
2039	16.8	6.0	4.4	2.8	2.3	5.1	20.5
2040	16.8	5.9	4.4	2.8	2.3	5.1	20.5
2041	16.8	5.9	4.5	2.8	2.2	5.1	20.5
2042	16.8	5.9	4.6	2.8	2.2	5.1	20.6
2043	16.8	5.9	4.6	2.8	2.2	5.1	20.6
2044	16.8	5.9	4.7	2.8	2.2	5.1	20.7
2045	16.8	5.9	4.8	2.8	2.1	5.1	20.7
2046	16.8	5.9	4.8	2.9	2.1	5.1	20.8
2047	16.8	5.9	4.9	2.9	2.1	5.1	20.8
2048	16.8	5.9	4.9	2.9	2.1	5.1	20.9
2049	16.8	5.9	5.0	2.9	2.0	5.1	20.9
2050	16.8	5.9	5.0	2.9	2.0	5.1	20.9
2051	16.8	5.9	5.0	2.9	2.0	5.1	21.0
2052	16.9	6.0	5.1	2.9	2.0	5.1	21.1
2053	16.9	6.0	5.1	2.9	2.0	5.1	21.1
2054	16.9	6.0	5.1	2.9	1.9	5.1	21.1
2055	17.0	6.1	5.2	2.9	1.9	5.1	21.2

The table reports the CBO long term economic projections for federal spending and revenues. Values represents the percentage of GDP.

Italy Baseline data for 2024 come from ISTAT's national government consolidated budget. Specifically, tax revenue data are from *Taxes and social contributions by subsector - Government sector* (2025), while data on education, pensions, and healthcare expenditures are based on the COFOG classification from *Social*

Table 21: BEA 2024 Government Receipts and Expenditures

Item	Amount	Profile Assignet	Growth Rate
Receipts	8115.7		
Fed: Personal current taxes	2394.3	CPS: FEDTAXAC	cbo-R
State&Local: Personal current taxes	641.4	CPS: STATETAXAC	cbo-R
Gov: Taxes on production and imports	1968.2	CEX	cbo-R
Gov: Taxes on corporate income	654.9	CPS: INCIDR	cbo-R
Gov: Taxes from the rest of the world	37.5	CEX	cbo-R
Gov: Contributions for government social insurance	1905.0	CPS: FICA	cbo-R
Gov: Current transfer receipts	284.5	CEX	cbo-R
Gov: Tariffs	229.9	constant	GDP
Expenditures	8 538.6		
Gov: Consumption expenditures			
• Non Education	2617.6	constant	GDP
• Education			
- Primary & Secondary	893.4	1/19 between 0-18, 0 ow	GDP-pop:: 0-18
-Higher	263.7	1/6 between 19- 24, 0 ow	GDP-pop: 19-24
-Other	142.1	1/25 between 0-24, 0 ow	GDP-pop: 0-24
Gov: Government social benefits - To the rest of the world	33.8	CPS: INCWELFR	GDP
Gov: Other current transfer payments	87.6	CPS: INCWELFR	GDP
Gov: Subsidies	94.6	CPS: INCWELFR	GDP
Fed: Government social benefits - To persons			
• Social Insurance Funds			
-Social Security	1441.8	CPS: INCSS	cbo -SocialSecurity
-Medicare	1073.1	CMS: Medicare	cms-Medicare
-Unemployment Insurance	35.3	CPS: INCUNEMP	cbo-mandatory
-Railroad retirement	15.2	CPS: INCSS	cbo -SocialSecurity
-Pension Benefit guaranty	1.0	CPS: INCSS	cbo -SocialSecurity
-Veterans' life Insurance	0.4	CPS: INCVET	cbo-mandatory
-Workers' compensation	3.6	CPS: INCWKCOM	cbo-mandatory
-Military Medical Insurance	7.2	CPS: INCWAGE	cbo-mandatory
• Veterans' Benefits	208.7	CPS: INCVET	cbo-mandatory
• Supplemental Nutrition Assistance Program	118.1	CPS: INCWELFR	cbo-mandatory
• Black lung benefits	0.2	CPS: INCWELFR	cbo-mandatory
• Supplemental security income	61.5	CPS: INCSSI	cbo-mandatory
• Direct relief	0	CPS: INCWELFR	cbo-mandatory
• Refundable tax credits	203.2	CPS: INCWELFR	cbo-mandatory
• Other	87.9	CPS: INCWELFR	cbo-mandatory
State&Local: Government social benefits - To persons			
• Social Insurance Funds			
-Temporary Disability Insurance	12.4	CPS: INCDISAB	GDP
-Workers' compensation	9.0	CPS: INCWKCOM	GDP
• Public Assistance			
-Medicaid	932.9	CMS: Medicaid	cbo-Medicaid
-Other medical care	14.8	CPS: INCWELFR	cbo-Medicaid
-Family Assistance	22.8	CPS: INCWELFR	cbo-Medicaid
-Supplemental Security Income	5.3	CPS: INCSSI	cbo-Medicaid
-General Assistance	39.0	CPS: INCWELFR	cbo-Medicaid
-Energy assistance	6.7	CPS: INCWELFR	cbo-Medicaid
-Other medical care	22.3	CPS: INCWELFR	cbo-Medicaid
• Education	78.6	CPS: INCWELFR	cbo-Medicaid
• Employment and training	1.5	CPS: INCWELFR	cbo-Medicaid
• Other	3.3	CPS: INCWELFR	cbo-Medicaid

The table reports the BEA Government Receipts and Expenditures, along with the profile and growth rate applied for the future.
The source is the Bureau of Economic Analysis (BEA) tables: Table 3.1. Government Current Receipts and Expenditures, Table 3.16. Government Current Expenditures by Function, Table 3.12. Government Social Benefits.

benefits by policy area, risk and need - Government sector (2025). Tables 22 and 23 present the detailed breakdown for each category.

Table 22: Government Consolidated Budget, 2024: Revenues

Broad category	Table code	Amount (million euros)	Assigned profile
REVENUES			
Personal income tax		232836	PIT
• Personal income tax and surcharges	D51AC01		
Direct taxes paid by corporations		55702	Corp
• Corporation tax	D51BC02		
• Capital gains tax on sell-off	D51C2C01		
• Tax on actuarial reserve	D51AC13		
• New tax on imputed income derived from the appreciation of corporate assets	D51BC08		
Taxes on deposits		14549	Deposits
• Withholding tax on income from deposits paid by households	D51AC04		
Taxes on savings and insurance schemes		4880	Savings
• Tax on invested savings	D51C1C02		
• Tax on life insurance and supplementary pension schemes	D51AC12		
Taxes on stocks		7983	Stocks
• Capital gains tax on shares	D51C1C01		
• Withholding tax on company dividends paid by households	D51AC10		
Tax on games of skill and betting		1272	VAT
• Tax on games of skill and betting – levied on current income and assets	D51DC01		
Taxes on rental and other properties		5723	RE
• Tax on boats and aircrafts — Payments for public-broadcasting services – households	D59AC01; D59AC02		
• Substitute tax on income from rental property	D51AC14		
Taxes on driving licences and motor-vehicles		5657	Driving Licences
• Driving licence tax	D59DC01		
• Motor-vehicle duty paid by households	D59DC02		
Other current direct taxes (includes residual)		14584	PIT
• Other current taxes on income and wealth	D59FC01		
Value-added tax (VAT)		210121	VAT
• Value-added tax (VAT)	D211C01		
• Excise duty on mineral oils	D214AC01		
• Regional special tax on dumping	D214HC03		
• Excise duty on beer	D214AC04		
• Excise duty on refinery gas	D214AC02		
• Excise duty on electricity and general electricity-system charges	D214AC05		
• Excise duty on methane and general gas-system charges	D214AC03		
• Local surcharge on electricity duty	D214AC06		
• Excise duty on spirits	D214BC02		
• Excise duty on tobacco	D214BC01		
• Entertainment tax	D214EC01		
• Casino takings, special duties, etc.	D214EC02		
• Single tax on games of skill and betting – levied indirectly on production	D214FC02		
• Tax on lotto, lotteries and betting	D214FC01		
• Tax on Totip game and horse-race bets	D214FC03		
• Tax on Totocalcio game	D214FC04		
• Taxes and duties on imports excluding VAT	D2121D2122C		
Substitute tax on income from rental property			
• Taxes related to real estate		45054	RE
• Registration tax	D214BC05		
• Stamp duties	D214BC04		
• Tax on insurance	D214GC02		
• Mortgage taxes and land-registry duties	D214BC06		
• Surcharges accruing on cadastral acts	D214BC07		
• Municipal tax on building licences	D214HC02		
Municipal real-estate tax (IMU) — Tax on Indivisible Services (TASI)	D29AC01+C02		
Taxes on motor vehicles, communications and pollution		11087	Driving Licences
• Public motor-vehicle register tax	D214DC01		
• Provincial tax on motor-vehicle insurances	D214GC01		
• Municipal tax on advertising	D214HC01		
• Motor-vehicle duty paid by firms	D29BC01		
• Duty on official franchises	D29EC02		
• Levy on communication-sector operators (Communications Authority)	D29HC03		
• Taxes on pollution	D29F_T		
Other corporate and production taxes		32458	Corp
• Other special duties on production	D29HC01		
• Regional tax on productive activities (IRAP)	D29HC06		
• Other taxes on production	D29HC02		
• Other minor indirect taxes	*including* D59AC04; D29AC03; D29HC04; D29HC05; D214CC01; D29HC12; D29HC005	10408	VAT
Capital taxes	*including* D51EC01	1784	PIT
Social-security contributions		275193	SSC
• Old-age, survivor, disability related	D61T		
• Other contributions (10 % proxy)			
Other revenues		103578	
•	residual		
Total		1032867	

Note: Millions of 2025 euros. Source: ISTAT (*Taxes and social contributions by subsector - Government sector* (2025)).

Table 23: Government Consolidated Budget, 2024: Expenditures and Primary Balance

Broad category	Table code	Amount (million euros)	Assigned profile
EXPENDITURES			
Education		-83243	
• Primary education			Primary
• Secondary education			Secondary
• Tertiary education			Higher
Healthcare		-130054	
• Drugs			Drugs
• General practitioners			GP
• Specialized practitioners			SP
• Hospitalizations			Hosp
• Diagnostic tests and other expenditures			DT
Pensions and LTC		-361081	
• Old-age pensions			Oldage
• Disability pensions			Disability
• Survivors pensions			Survivor
• LTC payments			LTC
Other non-age-related expenditures		-448856	
Total		-1023234	
PRIMARY BALANCE		9633	

Note: Amounts are in millions of euros. Source: ISTAT (*Social benefits by policy area, risk and need - Government sector* (2025)).

Medium-Term Projections (2025-2027). For the medium term (2025–2027), we reconcile 2024 baseline data with official government forecasts presented in the latest Economic and Financial Document (DEF) (*Documento di finanza pubblica - Sezione II - Analisi e tendenze della finanza pubblica* (2025)). The key figures from this document are reported in Table 24. This step is necessary to incorporate the projected path of fiscal aggregates under current legislation, most notably the planned phase-out of temporary measures such as expenditures tied to the National Recovery and Resilience Plan (PNRR) and the "Superbonus" tax credit scheme.

Table 24: Official Government Forecasts, 2025-2027

	Final	Forecast		
	2024	**2025**	**2026**	**2027**
Expenditures				
Total current (excl. interest)	905 394	933 458	955 384	965 197
of which pensions	336 984	344 410	355 300	365 620
Interest expenditure	85 180	88 972	92 405	99 872
Total current	990 574	1 022 430	1 047 789	1 065 069
Total capital	117 840	124 125	126 588	120 021
Total spending	**1 108 414**	**1 146 554**	**1 174 377**	**1 185 089**
Revenues				
Taxes	654 134	659 324	675 790	694 699
direct	343 185	342 705	350 208	361 512
indirect	309 128	315 017	323 976	331 579
capital	1 821	1 602	1 606	1 608
Social security contributions	275 193	298 455	308 046	317 316
Other current revenues	94 173	100 179	103 201	98 221
Total current revenues	1 026 097	1 060 858	1 090 015	1 113 293
Non-tax capital revenues	4 949	10 052	18 185	7 105
Total revenues	**1 032 867**	**1 072 512**	**1 109 806**	**1 122 005**
Primary balance	**9 633**	**14 929**	**27 833**	**36 787**
Nominal GDP	2 192 182	2 256 114	2 323 480	2 383 966

Note: Values are in millions of euros. The table reports key fiscal aggregates as projected in the government's Economic and Financial Document. Source: *Documento di finanza pubblica - Sezione II - Analisi e tendenze della finanza pubblica* (2025).

Long-Term Projections (2028-2100). Long-term projections from 2028 onward are based on the latest report from RGS (*Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024)). For the period 2028–2070, all tax revenues are projected to grow at the same rate as GDP projected by RGS (Table 25). Projections for age-related expenditures are taken directly from the RGS report as a share of GDP (Table 26). Beyond 2070, we assume per-capita GDP growth remains constant at its 2070 level; the growth rate of total GDP is then determined by the growth of the projected population. All fiscal aggregates are then projected to grow at this derived rate of total GDP.

Table 25: RGS Long-Term Macroeconomic Projections

	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Real GDP (bln € 2020)	1.670	1.954	2.023	2.068	2.116	2.187	2.278	2.383	2.493	2.595	2.692
NominalGDP (bln € 2020)	1.670	2.256	2.568	2.898	3.274	3.736	4.296	4.962	5.733	6.589	7.546
Real GDP per-capita (€ 2020)	28.001	33.142	34.550	35.741	37.113	39.020	41.547	44.710	48.353	52.071	55.693
Real GDP per-employee (€ 2020)	74.603	80.860	81.423	84.262	89.242	96.062	102.966	109.997	117.321	125.122	133.204
Nominal GDP per-capita	28.001	38.257	43.857	50.092	57.428	66.663	78.369	93.112	111.179	132.191	156.100
Nominal GDP per-employee	74.603	93.339	103.358	118.094	138.092	164.117	194.220	229.078	269.760	317.641	373.354
GDP deflator	100,0	115,4	126,9	140,2	154,7	170,8	188,6	208,3	229,9	253,9	280,3
HCPI	100,0	119,4	131,2	144,8	159,9	176,5	194,9	215,2	237,6	262,3	289,6

Note: Source: *Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024).

Table 26: RGS Projections for Age-Related Expenditures (% of GDP)

	2020	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Pensions	16,90%	15,30%	15,70%	16,70%	17,10%	16,80%	16,00%	14,90%	14,10%	13,90%	14,00%
Healthcare	7,30%	6,30%	6,20%		6,70%		7,10%		7,30%		7,20%
LTC	1,10%	1,00%	1,60%		1,80%		2,20%		2,40%		2,30%
Education	3,90%	3,70%	3,40%		3,20%		3,40%		3,30%		3,10%
Total	29,30%	26,40%	26,70%		28,80%		27,60%		25,80%		26,60%

Note: Source: *Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024).

A.2 Alternative Scenarios for Robustness Analysis

To test the sensitivity of our baseline results, we construct two alternative scenarios. In the case of Italy in both scenarios, the budgetary data for 2024 and the official government projections for 2025–2027 remain unchanged from the baseline. The scenarios differ in their long-term assumptions from 2028 onward.

Scenario 1: The UN Demographic Projection

To construct the fiscal projections based on the UN demographics we first rescale each item of the tax and transfer baseline fiscal projections by the UN population at the cohort-sex level. Hence we obtain fiscal projections that are coherent with the UN demographics. Second, we compute the growth rate for each projection year in the future and apply the growth rate to the 2025 revenues expenditure levels. This guarantees that the projections based on CBO and ISTAT population values are identical in 2025 to the ones using UN values.

Scenario 2: The EPC-WGA Baseline

The second alternative scenario for Italy uses the "EPC-WGA baseline" projections provided by the RGS (*Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024)). This scenario is developed in coordination with the European Commission's Economic Policy Committee -

Working Group on Ageing (EPC-WGA) to ensure comparability across EU member states. It differs from the national baseline scenario in several key assumptions:

- **Demographic Assumptions:** The scenario is built on the more optimistic EUROPOP2023 demographic projections from Eurostat (based on 2022 data). Compared to the national projections (based on 2023 data), the Eurostat series assumes higher fertility rates and stronger net migration flows.
- **Economic Assumptions:** The scenario projects a more favorable trajectory for productivity and output (Table 27). Real GDP is projected to grow at an average annual rate slightly above 1% between 2028 and 2070, supported by a 1.3% annual increase in labor productivity. The contraction in employment is consequently less pronounced.
- **Capital Accumulation:** The treatment of capital diverges from the baseline scenario. While the latter one assumes a constant investment-to-GDP ratio, the EPC-WGA approach transitions to a capital-to-GDP rule after 2043. This change decouples capital accumulation from employment dynamics, contributing to stronger long-term output growth.

As shown in Table 28, these more favorable assumptions translate into a lower projected path for public spending. Pension expenditure, for instance, is projected to be 13.8% of GDP in 2070, compared to 14.0% in the national baseline.

Table 27: EPC-WGA Scenario: Macroeconomic Projections

Indicator	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**2065**	**2070**
Real GDP (bln € 2020)	1.670	1.954	2.002	2.033	2.104	2.212	2.354	2.518	2.690	2.865	3.030
Nominal GDP (bln €)	1.670	2.256	2.541	2.850	3.256	3.780	4.441	5.243	6.186	7.273	8.493
Real GDP per capita (€ 2020)	28.001	33.160	34.073	34.683	35.978	38.053	40.967	44.571	48.639	52.883	56.889
Real GDP per employee (€ 2020)	74.603	80.860	81.771	84.693	90.112	97.639	105.487	113.550	121.775	130.122	138.545
Nominal GDP per capita (€)	28.001	38.278	43.252	48.608	55.672	65.011	77.274	92.822	111.837	134.252	159.453
Nominal GDP per employee (€)	74.603	93.339	103.800	118.699	139.438	166.810	198.979	236.478	280.000	330.334	388.325
GDP deflator	100.0	115.4	126.9	140.2	154.7	170.8	188.6	208.3	229.9	253.9	280.3
HCPI	100.0	119.4	131.2	144.8	159.9	176.5	194.9	215.2	237.6	262.3	289.6

Note: Source: *Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024).

Table 28: EPC-WGA Scenario: Age-Related Expenditures (% of GDP)

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**	**2055**	**2060**	**2065**	**2070**
Pensions	16.90%	15.30%	15.90%	16.90%	17.10%	16.80%	15.80%	14.70%	13.80%	13.50%	13.80%
Healthcare	7.30%	6.30%	6.30%	6.50%	6.70%	7.00%	7.10%	7.10%	7.20%	7.20%	7.20%
LTC	1.10%	1.00%	1.00%	1.10%	1.20%	1.20%	1.40%	1.50%	1.50%	1.50%	1.50%
Education	3.90%	3.70%	3.40%	3.20%	3.20%	3.30%	3.40%	3.40%	3.30%	3.20%	3.10%
Total	29.30%	26.40%	26.70%	27.80%	28.20%	28.30%	27.60%	26.70%	25.80%	25.40%	25.60%

Note: Source: *Mid/Long-Term Trends for the Pension, Health and Long-Term Care Systems – September Update* (2024).

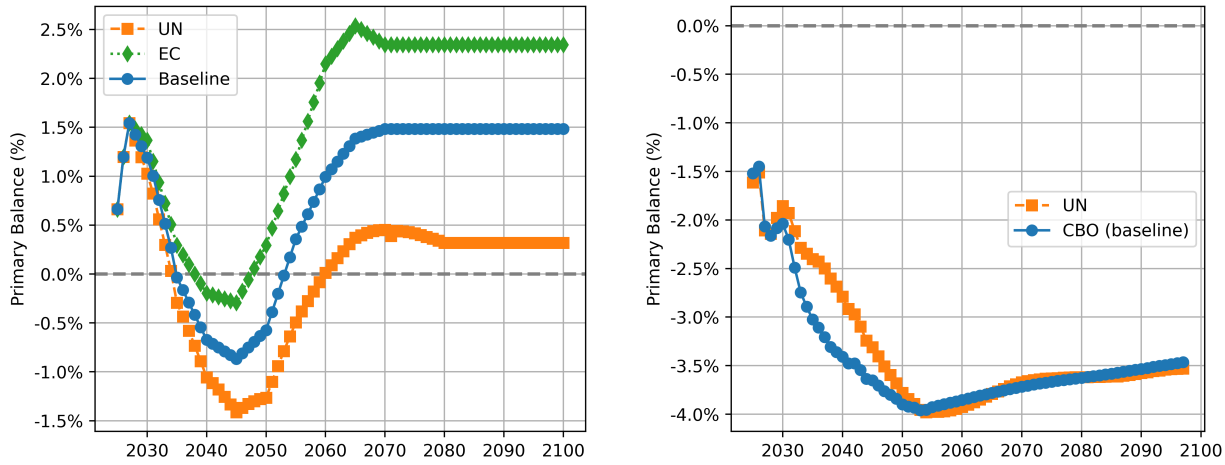
Comparison of Primary Balance Trajectories

Figure 6 compares the path of the primary balance under the baseline and the two alternative scenarios. The trajectory of the primary balance worsens under the UN demographic projections and improves under the EPC-WGA scenario.

While following a similar trend to the baseline, the UN scenario anticipates an earlier and deeper deterioration, with the primary balance turning negative from 2035 and reaching a deficit of 1.5% of GDP. The recovery is also slower, with the balance returning to surplus only after 2060 and stabilizing at a lower long-term level of around 0.3% of GDP.

In contrast, the EPC-WGA scenario is significantly more favorable. It projects only a modest and short-lived deficit-around 0.3% of GDP between 2039 and 2047-followed by a steady improvement. The primary balance returns to surplus and continues to rise, eventually stabilizing at approximately 2.4% of GDP in the long run.

Figure 6: Path of Primary Balance Under Alternative Scenarios



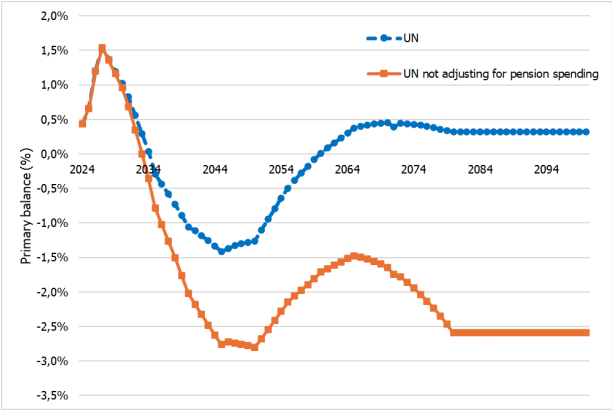
(a) Italy

(b) U.S.

Relaxing the assumption on the Italian NDC pension system

The automatic stabilizers embedded in Italy's NDC pension system are crucial for its long-term sustainability. Relaxing the assumption that these stabilizers hold pension spending constant as a share of GDP leads to a significant deterioration in the fiscal outlook under the UN demographic scenario. As illustrated in Figure 7, the primary balance path worsens, resulting in a deeper and more persistent deficit. Consequently, the fiscal gap, reported in Table 29, increases to 6.4 percent at a 4 percent discount rate. This larger imbalance places an unsustainable burden on future generations, whose required lifetime net tax rate rises to 124.5 percent, as shown in Table 30.

Figure 7: Path of Primary Balance relaxing assumption on pensions



(a) Italy

Table 29: Fiscal Gap, Italy: UN Demographic Projections, relaxing assumption on pensions

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
Fiscal Gap / PV Real GDP	4.3%	5.3%	6.4%	7.6%	8.8%	10.0%	11.2%
Required Decrease in Spending	7.5%	9.4%	11.5%	13.6%	15.8%	18.1%	20.4%
Required Increase in Taxes	7.8%	9.7%	11.8%	13.9%	16.1%	18.3%	20.6%
PV Net Transfers	2.8	1.4	0.8	0.5	0.3	0.2	0.2
Gov. Net Wealth	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Fiscal Gap	5.6	4.1	3.6	3.3	3.1	3.0	2.9
PV Real GDP	130.7	77.8	55.4	43.0	35.2	29.8	25.8

Note: Trillions of euros. PV references present value.

We assume GDP per capita grows at 1.31% in the long run, leading to a GDP growth of 0.5%.

Table 30: Generational Accounting, Italy: UN population, relaxing assumption on pensions

Real Discount Rate	2%	3%	4%	5%	6%	7%	8%
GA(0) / Lifetime Labor Income (0)	38.0%	36.3%	30.6%	21.1%	7.9%	-9.3%	-30.8%
GA(-1) / Lifetime Labor Income (-1)	79.1%	95.9%	124.5%	173.3%	253.9%	382.5%	581.5%
Ga(0)	342.7	215.7	121.5	57.0	14.7	-12.2	-28.6
Ga(-1)	714.2	569.0	494.2	467.6	472.9	499.2	539.2
Lifetime Labor Income (0)	902.9	593.6	396.9	269.8	186.3	130.5	92.7
Lifetime Labor Income (-1)	907.4	596.6	398.9	271.2	187.2	131.2	93.2

Note: Dollar amounts (GA(·) and NPV entries) are in thousands of dollars.

We assume GDP per capita grows at 1.31% in the long run, leading to a GDP growth of 0.5%.

A.3 Profiles

This section details the construction of the age-specific profiles used to allocate aggregate fiscal items to different cohorts. These profiles are a crucial input for the generational accounting model, as they determine the distribution of taxes and transfers across the population. The methodology for constructing these profiles differs by country based on data availability and institutional context, as detailed below.

A.3.1 US

This section details the methodology used to construct the US age-specific profiles. The main sources for profiles are the Annual Social and Economic Supplement (ASEC) to the 2023 Current Population Survey (CPS), the Consumer Expenditure Surveys (CEX), and the Centers for Medicare & Medicaid Services Statistics Reports (CMS). From the CPS provides individual data which we aggregated by age and sex using survey weights `ASECWT` to derive the following profiles: federal income tax liability after all credits (FEDTAXAC), state income tax liability after all credits (STATAXAC), interest, dividends, and rent (INCIDR); Social Security retirement payroll deductions (FICA); welfare income (INCWELFR); wage and salary income (INCWAGE); social security income (INCSS); unemployment benefits (INCUNEMP); worker's compensation (INCWKCOM); veteran's benefits (INCVET); supplemental security income (INCSSI); and disability benefits (INCDISAB). The original data report single-year age groups up to age 80, with a single category for age 85 and older. We fill in ages 81–84 by linearly interpolating between the values for ages 80 and 85, and assign the age-85 value to ages 86–100. Finally, we smooth the resulting series using a Gaussian-weighted centered rolling mean with a 10-year window and a standard deviation of 5. Figures 8 and 9 plot the original and smoothed series. The CEX reports average consumption expenditure for seven groups of age ("Under 25", "25-34", "35-44", "45-54", "55-64", "65-74", "75 and over"). We assign the average value to each age level within the group and smooth the series using a Gaussian-weighted centered rolling mean with a 15-year window and a standard deviation of 4. Figure 10 plots the original and smoothed series. We apply a similar procedure for the Medicare and Medicaid outlays by five age groups ("0-18", "19-44", "45-64", "65-84", "85+") and sex from the CMS. We smooth the series using a a Gaussian-weighted centered rolling mean with a 20-year window and a standard deviation of 5. Figure 11 plots the original and smoothed series.

Finally, for education, we assume separate uniform age profiles for expenditures on primary and secondary education (0-18), and higher education (19-24), and general (non-age-specific) education (0-24). Table 21 shows the profile assignments for each budget item.

Figure 8: US CPS Profiles 1/2

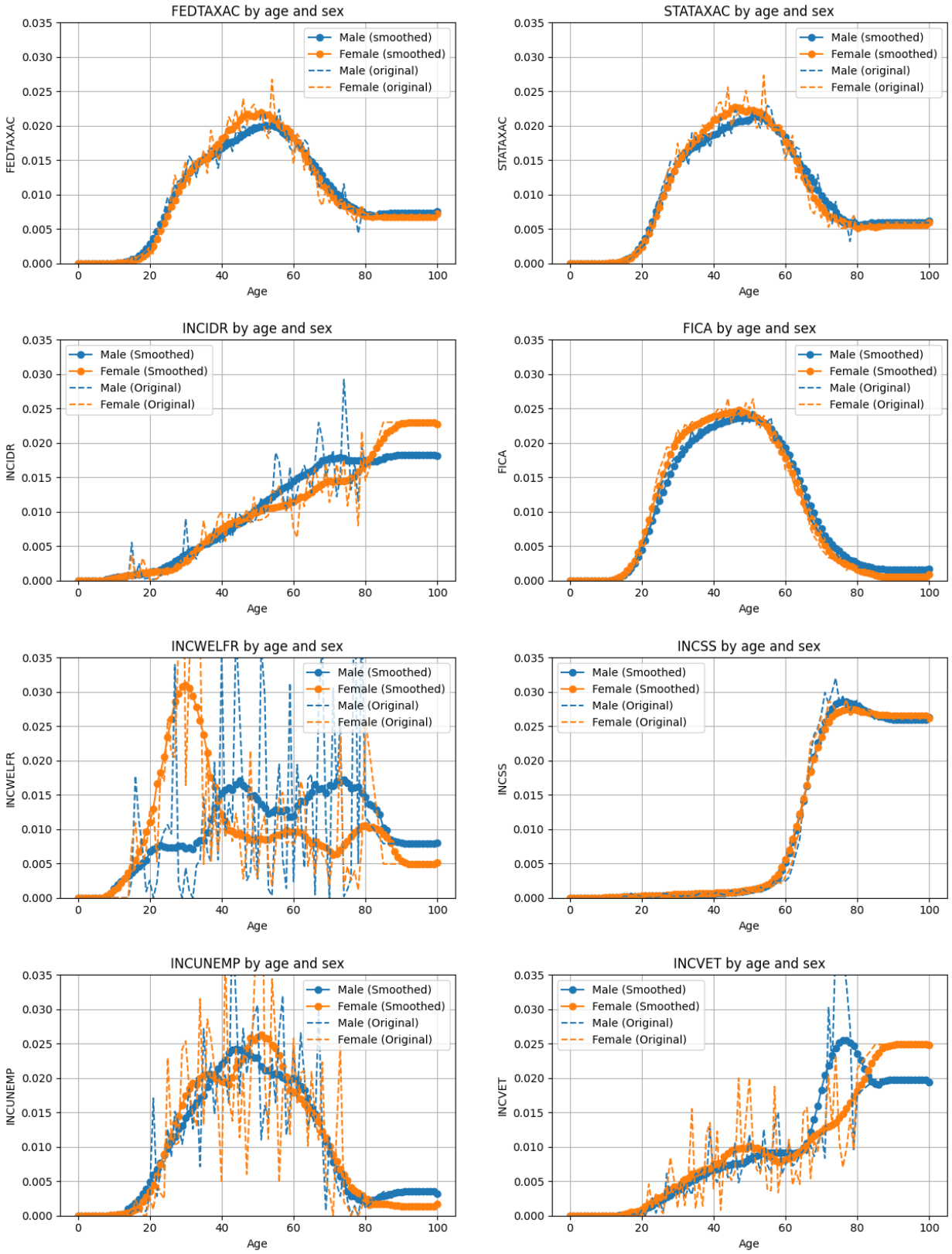


Figure 9: US CPS Profiles 2/2

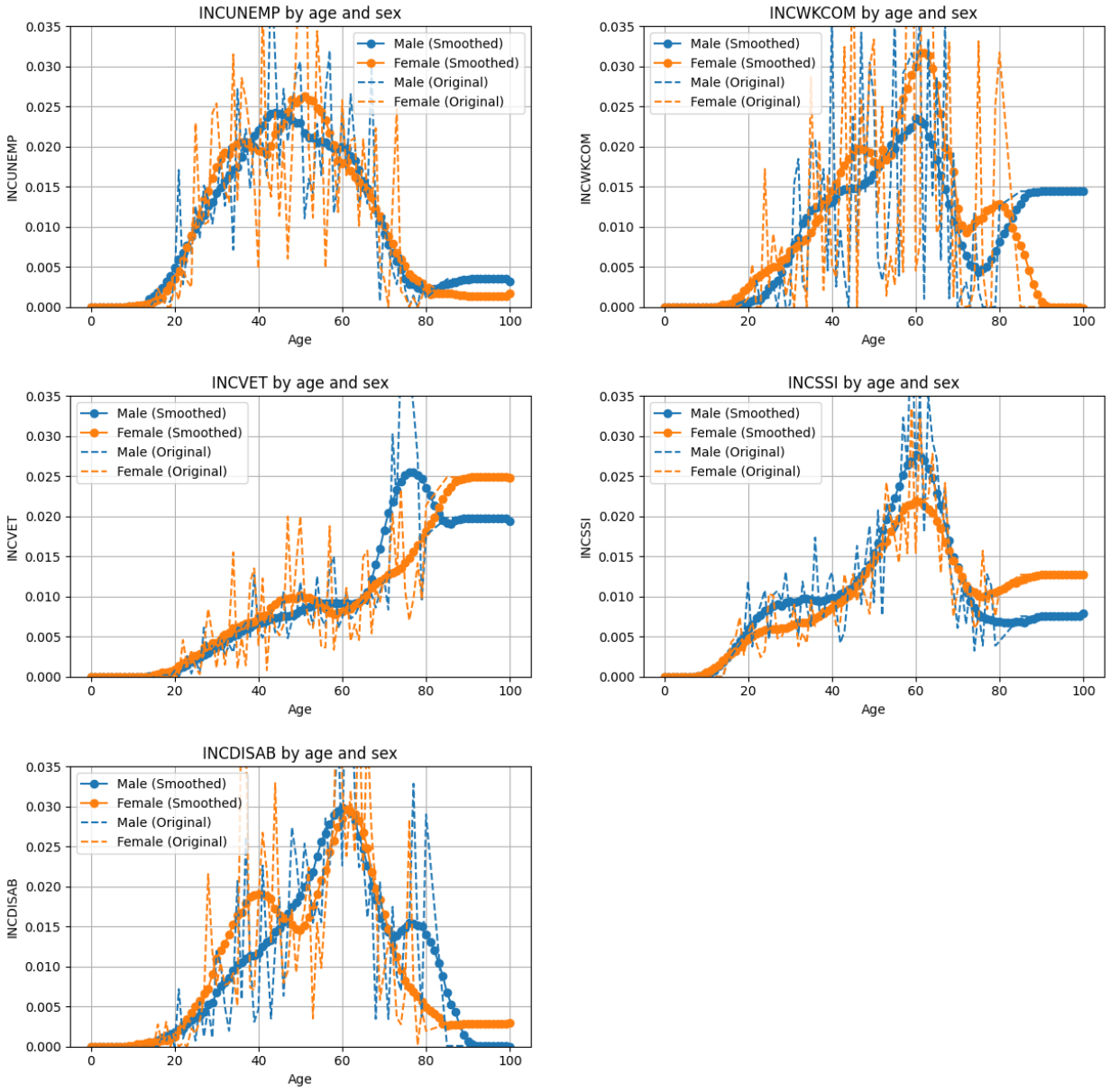


Figure 10: US CEX profile

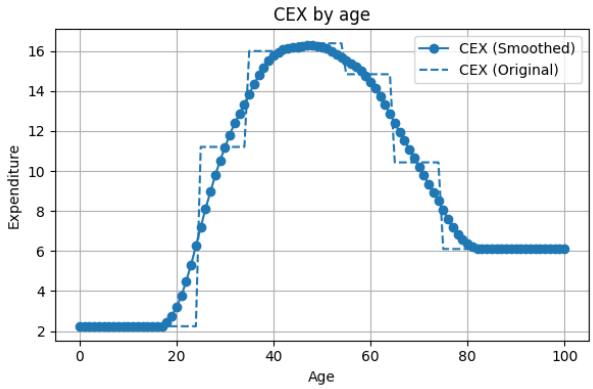
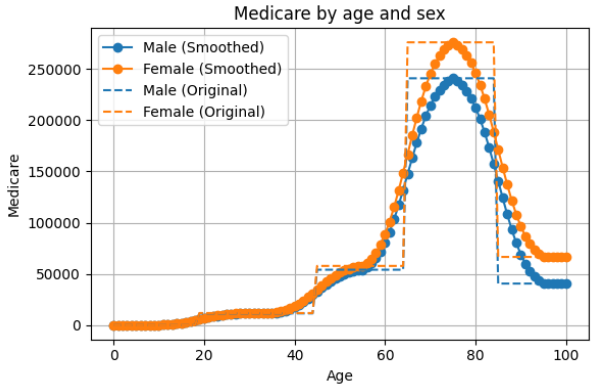
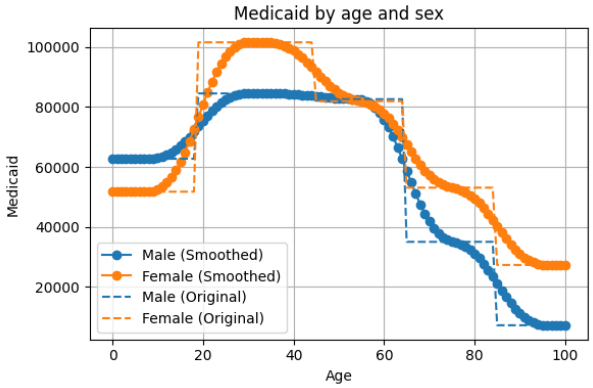


Figure 11: US CMS Profiles





A.3.2 Italy

This section details the methodology to construct age-specific profiles for major fiscal categories in Italy.

Revenue Profiles. We construct 9 distinct profiles for revenues, which are applied to the tax items listed in Table 22: Personal Income Tax (PIT), Corporate Taxes (Corp), Taxes on Deposits, Taxes on Stocks, Taxes on Savings and Insurance Schemes, Value Added Tax (VAT), Real Estate Taxes (RE), Taxes on Driving Licences and Motor Vehicles, and Social Security Contributions (SSC). The construction methodology varies by tax type:

- **Progressive Taxes (PIT and SSC):** Profiles for the progressive personal income tax and for social security contributions are estimated using the Banca d'Italia's tax-benefit microsimulation model (BIMic).
- **Proportional Taxes (VAT, Financial, and Wealth):** For taxes assumed to be proportional, we derive profiles from the distribution of the relevant tax base in the Survey on Household Income and Wealth (SHIW). The VAT profile is based on household consumption patterns. Profiles for taxes on financial instruments (deposits, stocks, savings) are based on household holdings of those assets. The real estate tax profile is based on the value of properties reported in the survey.
- **Corporate Taxes:** We assume the incidence of corporate taxes falls on taxpayers and use the age distribution of net income from the SHIW as a proxy for the profile.
- **Flat-Profile Taxes:** Taxes on driving licences and motor vehicles are allocated with a flat profile across all individuals aged 18 and over. All other residual revenues are also assigned a flat profile across all cohorts.

Figures 12 and 13 display the resulting set of revenue profiles.

Expenditure Profiles. We construct profiles for the main age-related public expenditures: healthcare, pensions, and education. These items account for approximately two-thirds of total government spending. The remainder, which includes non-distributable items such as defense, justice, and general administrative spending, is allocated using a uniform profile across all age cohorts.

- **Healthcare:** Following the 2015 ISTAT survey on health conditions (*European Health Interview Survey (EHIS)* (2015)), we create profiles for five spending categories: pharmaceuticals (Drugs), hospitalizations (Hosp), diagnostics (DT), general practitioner consultations (GP), and specialist consultations (SP). The profiles are based on the reported use of these services by age-sex cohort, as shown in figure 14.
- **Non-Contributory Pensions:** Profiles for non-contributory benefits (long-term care, disability, and survivor pensions) are derived from the SHIW, based on the amount of benefits households report receiving. These are shown in figure 15.

- **Education:** Spending is split into three categories: primary/pre-primary, secondary, and tertiary education. We allocate primary and secondary spending assuming compulsory schooling up to age 16. For tertiary education, we rely on student enrollment data from the SHIW. This approach yields similar profiles to using aggregate enrollment data from the Ministry of Education. Figure 16 displays the education profiles.

The Time-Invariance Assumption. A key assumption in our analysis is that the age-profiles described above are time-invariant, except for the old-age pension and contribution profiles detailed below. This approach is standard in the literature and relies on the premise that the relative patterns of consumption, income, and wealth across age groups are stable over time. While this is a strong assumption, it primarily affects the inter-cohort distribution of future taxes and transfers, not their aggregate levels, thus leaving the overall fiscal gap estimates largely unaffected.

Dynamic Old-Age Pension and Contribution Profiles. The generosity of Italy's old-age pension system has changed significantly over the past three decades due to a series of major reforms aimed at ensuring long-term fiscal sustainability. This history necessitates the estimation of time-varying profiles for old-age pensions and contributions using a dedicated microsimulation model.[24]

The model captures the effects of the gradual transition from a defined-benefit system to a Notional Defined Contribution (NDC) system. This shift introduced powerful automatic stabilizers that intrinsically link pension outlays to macroeconomic and demographic trends. The Dini Reform (1995) was pivotal, establishing the NDC framework where the value of each worker's accrued pension wealth (montante contributivo) is directly linked to the growth rate of nominal GDP. Later, the Fornero Reform (2012) accelerated the transition and strengthened the link to longevity through two key mechanisms: it systematized the use of "transformation coefficients" (*coefficienti di trasformazione*), which are actuarial factors that convert accumulated contributions into an annual pension based on life expectancy at retirement, and it indexed the statutory retirement age itself to changes in average life expectancy. Our model does not account for certain temporary early retirement windows (e.g., "Quota 100"), as these schemes have largely phased out or affect a small number of workers in the long run.

The simulation model starts with current contribution data from the SHIW, projects individual wage growth in line with aggregate productivity growth, and applies the specific eligibility and benefit calculation rules of each pension regime to the relevant cohorts. We assume workers retire as soon as they meet the minimum old-age and contribution requirements. While simplified, this model effectively captures the main trend in the evolution of pension generosity across cohorts. Figure 17 plots the resulting dynamics of the old-age pension profiles, which shift from single-peaked to bimodal and back as the new system phases in and older generations exit.

[24] A fully consistent projection would also adjust PIT profiles for the lower taxable income of future retirees. Doing so would primarily redistribute the tax burden from future retirees to future workers, slightly increasing the fiscal burden on future generations but having a limited impact on the aggregate gap.

Figure 12: Italy: Revenue Profiles by Tax Type (1/2)

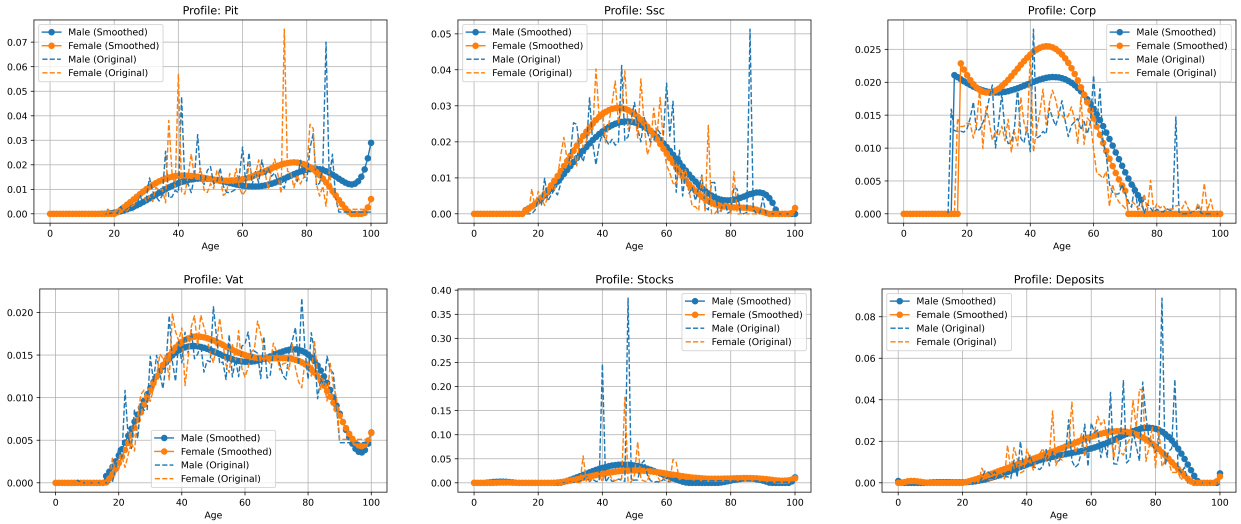


Figure 13: Italy: Revenue Profiles by Tax Type (2/2)

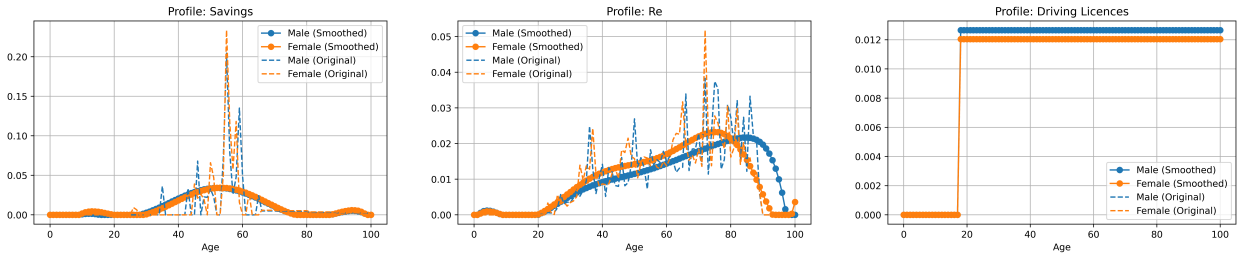


Figure 14: Italy: Healthcare Expenditure Profiles

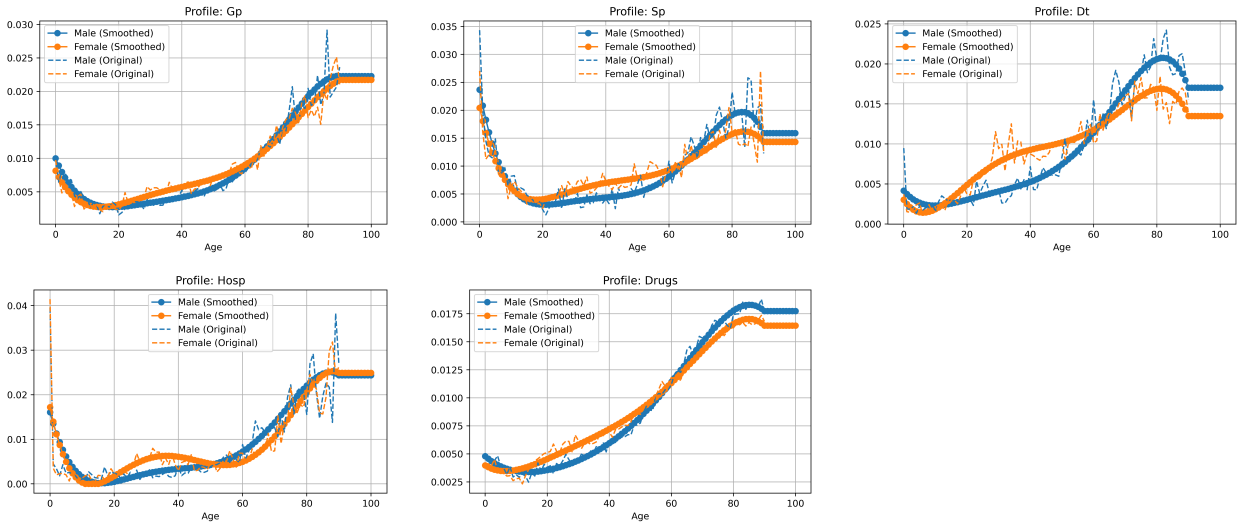


Figure 15: Italy: Non-Contributory Pension Profiles

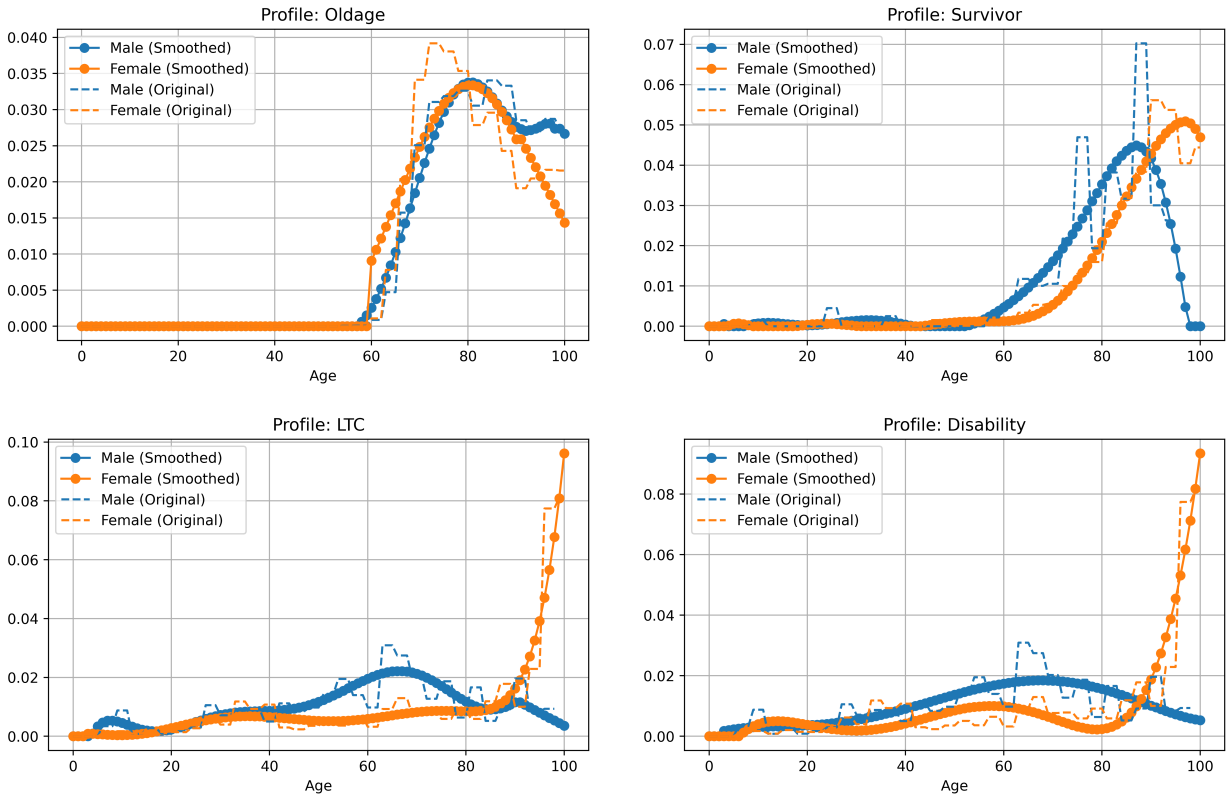


Figure 16: Italy: Education Expenditure Profiles

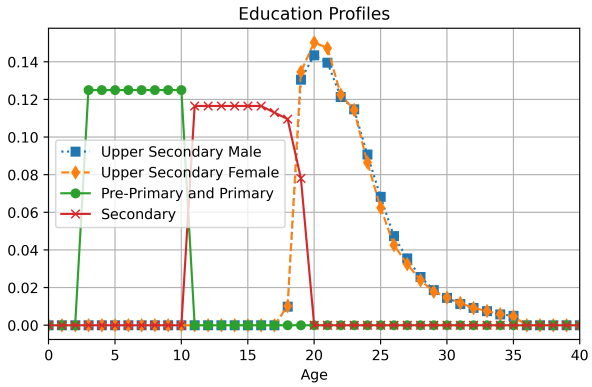
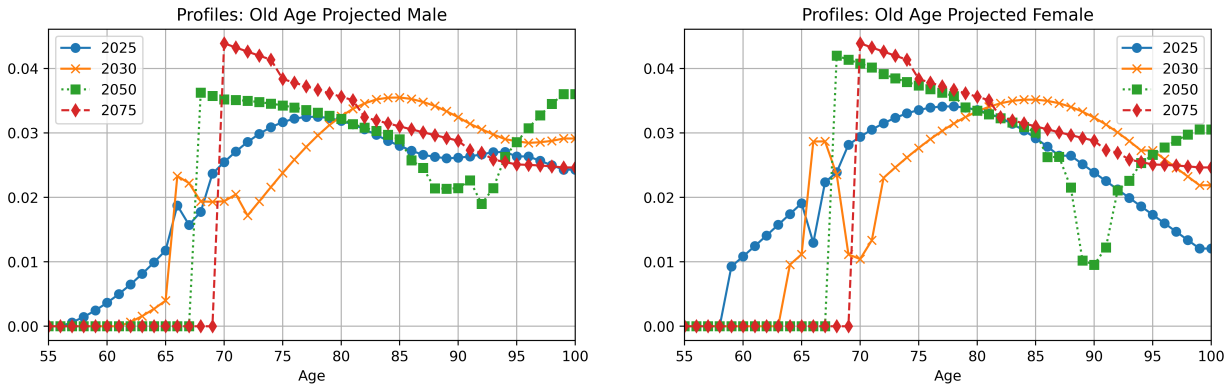


Figure 17: Italy: Simulated Dynamics of Old-Age Pension Profiles



A.4 Return on Net Wealth

Following identity (5), we calculate the real rate of return on national wealth based on official macroeconomic data as detailed below. This identity expresses the change in national wealth ($W_{t+1} - W_t$) as the difference between national income (E_t) and total consumption ($C_t + G_t$), plus the return on existing wealth (rW_t).

US Our data for calculating historic returns to US wealth come from the Federal Reserve and the BEA. National Net Worth (W_t) is constructed by summing three FRED series: Household and Non-Profit Net Worth (`TNWBSHNO`), Federal Government Net Worth (`FGNETWQ027S`), and State and Local Government Net Worth (`SLGTPAQ027S`). Annual values are the average of each year's quarterly values. Net National Saving ($E_t - C_t - G_t$) is computed from the BEA's National Income and Product Accounts (NIPA), where E_t, C_t, and G_t reference national labor earnings, household consumption, and government consumption, respectively. E_t is measured as the product of national income at producer prices (NIPA Table 1.7.5, Line 32, multiplied by the labor's share of income) from which we subtract household consumption (C_t, NIPA Table 2.3.5, Line 1) and government consumption (G_t, NIPA Table 3.1, Line 21), adjusted by adding back taxes on production and imports less subsidies (NIPA Table 1.7.5, Line 18). The resulting nominal rate of return is converted to a real rate using the annual inflation rate, calculated from the Consumer Price Index for All Urban Consumers (`CPIAUCSL`) from FRED.

Italy We calculate the real rate of return on national wealth for Italy using data from ISTAT and Banca d'Italia. In particular, National net worth is sourced from Banca d'Italia; Net national income, Household final consumption expenditure, Government consumption, Taxes on Production and Subsidies, Compensation of Employees and Propietorship's income are derived from ISTAT Sequence of Accounts and Institutional Sector Accounts[25].

[25] We also calculate the share of labor income relying on the reported figure from FRED with similar results.

This approach allows to back out the return on wealth as a residual - essentially, the portion of wealth growth not explained by income and consumption flows.