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14 Generational Accounts for the Netherlands

A. Lans Bovenberg and Harry ter Rele

14.1 Introduction

The intertemporal consequences of fiscal policies in the Netherlands are traditionally assessed on the basis of the budget deficit, public debt, and net government wealth. The explicit analysis of the impact of fiscal policy on the welfare of currently living generations and generations that are yet to be born has received only little attention.[1] Generational accounting provides a tool for the investigation of the intergenerational distributional effects of fiscal policy. Moreover, its forward-looking properties allow one to explore how various future developments affect the sustainability of public finances. In particular, in the decades to come, the prospective aging of the population and the depletion of natural gas reserves are expected to put a substantial burden on public finances in the Netherlands. At the same time, increasing participation of the middle-aged in the labor force and increasing taxable income from funded private pension schemes are expected to alleviate this burden by strengthening the tax base. Generational accounting is comprehensive in that it includes all budget items (i.e., both spending and taxes). Hence, it provides a useful framework for exploring how future developments and fiscal policy interact in affecting the sustainability of public finances and the welfare of various generations, thereby offering policymakers an explicit equity choice.

Generational accounting yields two important measures. The first one is the

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1. Only recently, both the Dutch central bank (see Hebbink 1996) and the Ministry of Finance (see Kempen 1996) started to explicitly explore the intergenerational impacts of fiscal policy.

level of the net tax burden (the gross tax burden minus gross transfers) on future generations. It is found residually from the intertemporal government budget constraint and the net benefits that currently living generations derive from current fiscal policy. Accordingly, future generations are assumed to absorb the entire adjustment required to make the claims of various generations consistent with the intertemporal budget constraint. The level of the net tax burden on future generations is highly sensitive to the level of government purchases because generational accounts do not assign the incidence of public purchases to generations.[2]

The second measure is the *difference* between the tax burden on newborns (these are the youngest members of the current generations), whose net tax burden depends on current fiscal rules unconstrained by the government budget constraint, and the tax burden on future generations, whose net tax burden is determined residually from the government budget constraint rather than on the basis of current rules. The tax burdens on these two generations are comparable because they both apply to an entire lifetime. Measuring the generational imbalance as the difference between these two tax burdens yields two further advantages. First, the difference measure is much less sensitive to the level of government purchases. Second, it provides a measure for the sustainability of public finances. If the net burdens of newborn and future generations coincide, current fiscal policy is consistent with the government budget constraint and is thus sustainable. However, if future generations bear a heavier tax burden than newborns do, current fiscal rules will have to be adjusted in the future to meet the budget constraint. In view of these two advantages, this paper will focus on the second measure, that is, the difference between the tax burdens of newborn and future generations.[3]

The rest of the paper is organized as follows. After providing a historical overview of Dutch fiscal policies (section 14.2) and briefly describing our data sources (section 14.3), we present our results in section 14.4. The standard method of applying generational accounting yields a generational imbalance of $87,600, or 17.1 percent of projected lifetime income. However, if the impact of increasing labor participation and rising pension incomes on the tax base is taken into account, the generational imbalance declines to $24,300, or 4.7 percent of lifetime income. In subsection 14.4.3 we explore the effects of assigning the benefits of government purchases and the public capital stock to generations. Section 14.5 explores various policy reforms aimed at establishing generational balance. Section 14.6 contains the conclusions.

2. However, subsection 14.4.3 distributes the benefits from these purchases over generations. This allows us to more readily interpret the net tax burden on future generations as the net "debt" that current generations shift onto future generations.

3. A further advantage of this measure compared to the first measure is that it is less sensitive to the allocation of benefits over the life cycle, which is sometimes rather arbitrary.

14.2 Historical Overview of Fiscal Policy

The Capital Principle. During the first decade after the Second World War, the Netherlands applied the capital principle to the national budget. This principle involves a tax-financed current budget and a debt-financed capital budget. By prohibiting debt financing of current spending, net government wealth is protected. However, fiscal policy in the early fifties was actually tighter than prescribed by the capital principle in order to cut the extremely high level of government debt inherited from the war.

Fine-Tuning. During a short period in the second half of the fifties, the budget was used to pursue activist, countercyclical Keynesian policies. However, experience with countercyclical policies was unfavorable because it was employed in an asymmetric fashion; whereas demand was stimulated in a weak economy, it was barely curbed in a boom. Moreover, identifying the turning points in the business cycle proved to be too difficult for successfully fine-tuning fiscal policy.

Structural Fiscal Policy. A structural budget norm ended activist fiscal policy in the beginning of the sixties. While fine-tuning was abolished, automatic stabilizers were allowed to stabilize the economy. Accordingly, the actual deficit was permitted to differ from its structural level. The structural deficit norm was derived so that government borrowing would match the structural level of net saving in the private sector, adjusted for a desired structural surplus on the current account of the balance of payments to finance development aid. Based on the trend rate of economic growth, the so-called structural budgetary room was established, which defined the resources available for either tax cuts or spending increases. This enhanced overall budget discipline by strengthening the position of the finance minister.

Containing the Tax Burden. In the midseventies, without abandoning the structural deficit norm, a new norm was introduced in order to contain the tax burden. In particular, the rise of the tax burden as a percentage of GDP was limited to 1 percentage point per annum.

Cutting the Actual Deficit. Structural fiscal policy began to show serious weaknesses at the end of the seventies. The projected trend growth rate proved to be too optimistic, resulting in surging fiscal deficits. In the early eighties, during the most serious economic slowdown since the Second World War, Dutch fiscal policy got seriously out of hand. The fiscal deficit rose to almost 10 percent of GDP (see fig. 14.1). Moreover, revenues from natural gas proved to be rather volatile due to changes in oil prices. At that time, taxation and social security contributions accounted for nearly 50 percent of GDP. The structural budget

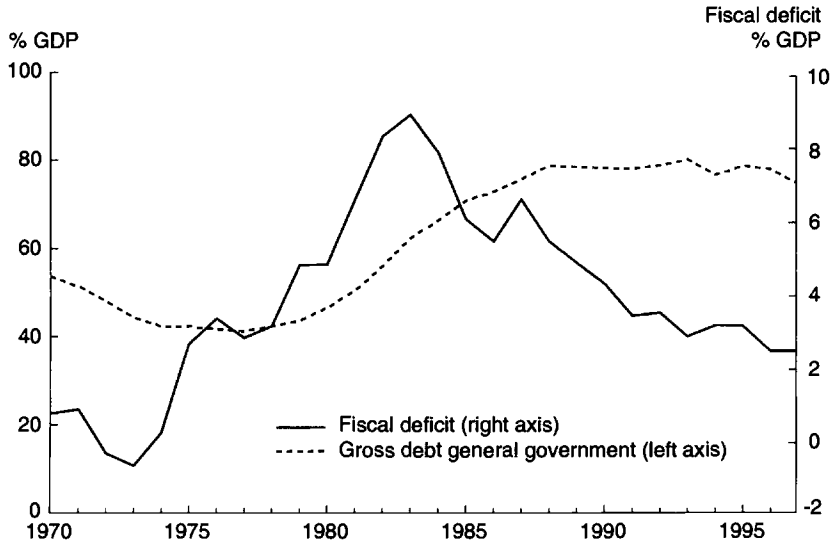

Fig. 14.1 Public finances, 1970–97

norm was replaced by a norm for the actual deficit. Indeed, deficit reduction was to become the leading issue for more than a decade and three successive cabinets. In view of the high tax burden, fiscal adjustment was pursued through expenditure cutbacks.

The Present Situation. By the time the deficit had reached a more sustainable level in the beginning of the nineties, the scope for a more long-term-oriented fiscal policy reemerged. Indeed, two important lessons have been learned from the experience of fiscal policy in the eighties and early nineties. First, the targets for cuts in the actual fiscal deficit made budgetary policy rather sensitive to the cycle. Spending overruns were accommodated in booms. During slumps, in contrast, spending had to be cut substantially to meet the targets for the actual deficits. To avoid unrest in the budgetary process and to better control spending, the present government has set a ceiling on public expenditure for the period 1994–98, which more or less excludes any rise in real terms. So the deficit is allowed to fluctuate with tax receipts up to a certain limit, above which measures have to be taken to cut the actual deficit. The second lesson from fiscal policy in the beginning of the nineties is that a government program based on a favorable economic outlook can seriously disrupt the budgetary process if growth turns out to be slower than anticipated. Accordingly, the present coalition has estimated receipts from taxation and social security contributions on the basis of a cautious economic scenario, which assumes that the economy grows only at a modest rate of 2 percent.

The Economic and Monetary Union Criteria. The Economic and Monetary Union (EMU) convergence criteria set by the Maastricht Treaty are an important yardstick for fiscal policy. Whereas the fiscal deficit in 1997 is projected to satisfy the norm of 3 percent of GDP, the stock of government debt (at about 77 percent of GDP in 1996) still violates the EMU ceiling of 60 percent of GDP. Therefore, the government intends to use the treaty's "escape clause," which states that in case public debt exceeds the 60 percent norm, it should be declining at a reasonable rate. Indeed, general government gross debt fell by more than 5 percent of GDP in 1997 to just below 72 percent of GDP, in part due to a one-off reduction in the government account at the Dutch central bank.

Future Fiscal Policy and Aging. In recent years, several analysts have argued that the prospective aging of the population requires a further reduction of the fiscal deficit, thereby substantially cutting public debt. This would allow lower future interest payments to compensate for the rising cost of old-age benefits and health care. The generational accounting approach pursued in this paper is intended to provide more insights on how aging affects the public finances.

14.3 Data Sources

Statistics Netherlands (CBS), the official Dutch statistical bureau, supplies the data on the present situation. Projections of future economic variables were derived from CPB Netherlands Bureau for Economic Policy Analysis, the independent government bureau producing the official macroeconomic forecasts. CPB constructed the data on the 1995 budget on the basis of national accounts data provided by CBS. The age profiles for taxes were derived from Deelen (1995), which in turn drew its data from a large household survey (Woningbehoefteonderzoek) performed by CBS. This latter bureau also produced the demographic projections. The other future variables are derived from CPB projections. In particular, the long-term scenario analysis of CPB (1992) provided the main guide for future changes expected to take place in the private sector.

14.4 Basic Findings and Sensitivity Analysis

The first part of this section explores the intergenerational effects of current fiscal policies. The second part conducts some sensitivity analyses with respect to future economic developments. The final part explores the sensitivity of the results with respect to an alternative method of generational accounting that assigns the incidence of not only taxes and transfers but also government purchases to generations.

Table 14.1 **Generational Imbalance (present value in thousands of U.S. dollars)**

	Variant 1 (standard)	Variant 2 (including increasing participation)	Variant 3 (including higher private pensions)	Variant 4 (including flattening of wage profile)
Net taxes paid by				
Newborns	49.4	63.0	65.2	65.8
Future generations	137.0	95.8	81.9	90.1
Generational imbalance				
In dollar terms	87.6	32.8	16.7	24.3
As a percentage difference	177.1	52.0	25.6	36.9
As a percentage of lifetime income	17.1	6.4	3.3	4.7

Notes: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

The variants are cumulative. Hence, in addition to the change in parentheses, each variant includes also the changes included in the previous variant.

14.4.1 Current Fiscal Policy

We first apply the standard method for calculating generational accounts to the Netherlands.[4] This standard method, however, ignores several important future changes in the Dutch economic environment affecting the life cycle pattern of taxes. These changes include, first, an increase in labor force participation; second, the maturing of private, funded pension funds; and, third, a flattening of the age-earnings profile. We discuss how sensitive the generational accounts are with respect to these three developments by incorporating them step by step.

Standard Method

The standard practice in generational accounting assumes that the age profiles of the various taxes and transfers change only with legislated or very likely policy reforms. Our first variant (variant 1) employs this traditional approach. The basis for the extrapolation of policies is the projected budget in 1998, when the present government completes its legislative period.[5] This budget incorporates the effects of all policies agreed on by the political parties making up the present government. In addition, for the period beyond 1998, we account for the lagged impact of already legislated measures that restrict the eligibility for disability and survivor benefits. Variant 1 in table 14.1 reveals that current policies appear to be unsustainable, as they benefit current generations at the expense of future generations. In particular, whereas newborns pay

4. In particular, we assume that social security premiums are constant and do not endogenously respond to changes in social security spending in order to maintain balance in the social security accounts.

5. For the period between 1995 and 1998, we adopt the realized and projected budget figures contained in CPB (1996).

Table 14.2 **Present Value of Future Net Tax Payments per Capita (thousands of U.S. dollars; constant prices, adjusted for income growth)**

Generation's Age in 1995	Variant 1	Variant 4
0	49.4	65.8
5	68.9	88.0
10	113.8	135.3
15	164.0	186.9
20	209.9	234.0
25	237.3	261.6
30	222.0	245.4
35	196.7	218.3
40	161.2	180.7
45	116.3	132.3
50	62.2	74.3
55	5.5	14.2
60	−46.5	−40.3
65	−91.4	−87.1
70	−103.4	−100.7
75	−113.0	−111.6
80	−118.0	−117.3
85	−116.6	−116.3
90	−110.9	−110.7
Future generations	137.0	90.1
Generational imbalance		
In dollar terms	87.6	24.3
As a percentage difference	177.1	36.9
As a percentage of lifetime income	17.1	4.7

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

only $49,400 in net lifetime taxes, future generations bear a lifetime tax burden of $137,000. The difference in the tax burden between newborns and future generations amounts to 17.1 percent of lifetime income.

Table 14.2 (variant 1) shows that the present values of net tax payments over the remaining lifetimes of presently living generations vary substantially with age. The young and middle-aged are net contributors to the budget over their remaining lifetimes. The elderly, in contrast, are net beneficiaries. This lifetime pattern reflects the age profile of both public spending and revenue.

Figure 14.2 contains the age profile of benefits from aggregate public spending (excluding government purchases) and its main components. It indicates that benefits from social security rise with age. This pattern is due mainly to public old-age benefits, which are paid only to citizens over 65 years old, and disability benefits, which increase with age for those younger than 65 years. Benefits from health care also rise strongly with age.

Figure 14.3 reveals that revenues also vary with age. Until about age 50,

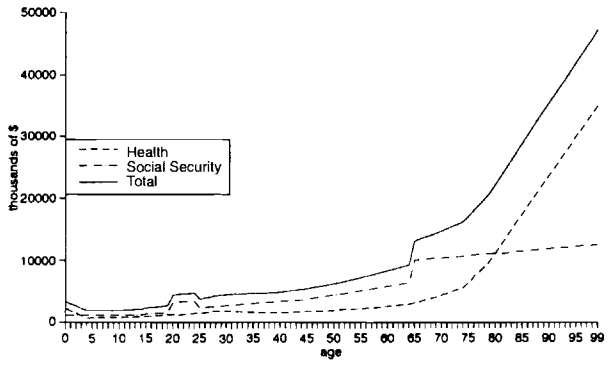

Fig. 14.2 Age profile of expenditures, 1995

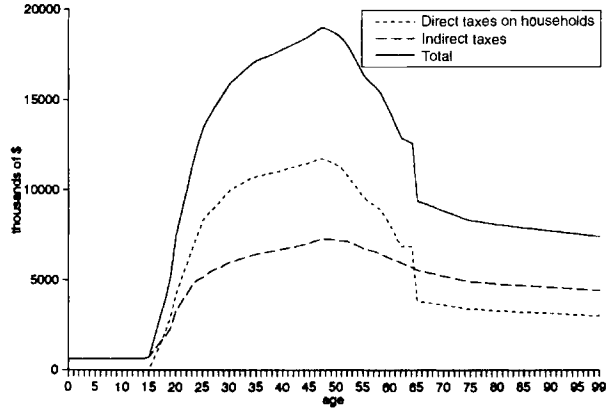

Fig. 14.3 Age profile of taxes, 1995

labor incomes (and hence tax revenues from these incomes) rise with age, explaining the upward slope in the tax profile. Beyond age 50, tax payments fall because participation in the labor force gradually decreases. The declining labor incomes are not fully offset by various forms of pension income, which are subject to income tax. Accordingly, both income taxes (which include social security premiums) and indirect taxes (which are linked to net income) fall with age. Compared to indirect taxes, direct taxes drop more rapidly at age 65 because individuals over 65 years old are exempt from contributing to various social security schemes, including the public old-age scheme. Overall, compared to the middle-aged, the elderly contribute significantly less to the budget. Combining the expenditure and revenue sides of the budget, figure 14.4 shows the age profile of total net contribution to the government budget.

Rising Labor Force Participation

The standard practice in generational accounting implicitly assumes that the currently observed rate of labor force participation remains constant in the fu-

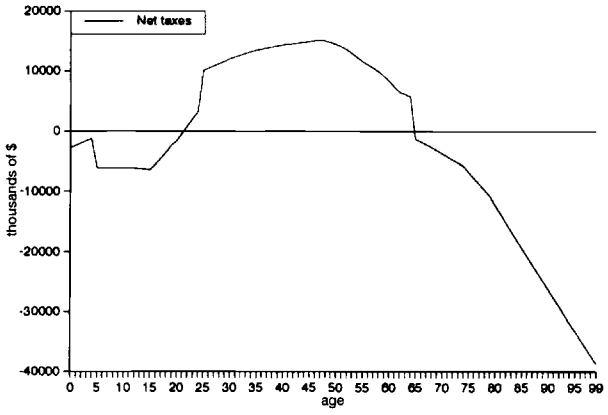

Fig. 14.4 Age profile of total net taxes, 1995

Table 14.3 Participation Rates of Various Age Groups in Full-Time Equivalents, 1995 and 2020

		2020[a]		
Age Group	1995	Low	Base	High
20–34	73.1	76.6	75.8[b]	77.2
35–49	72.0	79.2	84.1	86.2
50–64	37.7	43.7	55.3	60.5
Total	64.1	65.3	70.5	73.9

Source: CBS/CPB (1997).

[a]Adjusted for rise in part-time employment.

[b]This rate is lower than the corresponding rate in the low scenario because the young spend more years in full-time education in the base scenario. The resulting higher stock of human capital allows them to participate at higher rates in later years.

ture. For the Netherlands, this assumption is unrealistic. This country has traditionally featured a low participation rate of women. Over the past decade, however, the participation rate of women has started to rise sharply and is expected to continue to increase substantially in the future. Rising educational levels of women contribute to this development. Indeed, lower fertility not only gives rise to aging but also boosts participation of women. Recent policy measures limiting eligibility for disability benefits are expected to further increase labor force participation, especially of the elderly.

A higher participation rate widens the tax base by raising labor incomes. To account for this effect, variant 2 assumes that taxes paid by a particular age group depend not only on labor productivity and the number of people in that group but also on the projected labor force participation rate of the age group involved. Table 14.3 compares current age-specific participation rates with projections of these participation rates in 2020 for three alternative scenarios. The

Table 14.4 **Assets of Pension Funds, 1991**

Country	Assets (% of GDP)
Netherlands[a]	75.9
Germany[a]	15.5
United Kingdom	60.1
France	4.6
Denmark	51.6
Belgium	10.5

Source: Report by the European Commission's Network of Experts on Supplementary Pensions.
[a]1992.

projections for the base case imply that the participation rate of those between 20 and 64 years of age (adjusted for the rise in part-time employment) will rise by about 10 percent (or 6.4 percentage points) between 1995 and 2020. The older age groups are expected to feature the largest boost in labor force participation.

The higher participation rate reduces the generational imbalance substantially. The net tax burden borne by future generations falls from $137,000 in variant 1 to $95,800 in variant 2 (see table 14.1). In the latter variant, the tax burden exceeds that of newborns by only $32,800 (compared to $87,600 in variant 1).

Rising Pension Incomes

A projected increase in private pension incomes is the second factor requiring an adjustment of the age profile. Public pension benefits in the Netherlands are flat (i.e., unrelated to income) so that the public benefit level is relatively low for middle- and high-income earners. For these income groups, collective labor agreements supplement the public benefits with compulsory occupational pension provisions. These provisions are financed by funded pensions funds, which have accumulated financial assets sizable by international standards (see table 14.4). During the coming decades these funds are expected to mature so that an increasing part of the population will have accumulated substantial pension rights when reaching retirement age.

Higher pension incomes strengthen the tax base because retirement benefits are subject to income tax, while indirect taxes are levied on consumption out of these benefits. Variant 3 assumes that average net income of an individual over 65 years of age relative to that of an individual between 35 and 49 years will rise from 78 to 85 percent between 1995 and 2020.[6] The resulting increase in tax payments alleviates the generational imbalance further; future genera-

6. These figures are derived from Deelen (1995) and the "European Renaissance" scenario in CPB (1992). This scenario employs projections about future labor force participation similar to the base case in table 14.3.

tions now pay only $16,700 (3.3 percent of lifetime income) more in lifetime taxes than newborns do (table 14.1).

Flatter Age-Earnings Profile

The third phenomenon that calls for an adjustment of the future age profile of taxes is the expected flattening of the age-earnings profile. Wages currently rise rather sharply with age. A number of developments, however, are expected to reduce wages of elderly workers compared to wages of the young. First, market forces increasingly link wages to productivity, thereby reducing the importance of implicit lifetime labor contracts in firms. Second, the aging of the labor force renders younger workers more scarce compared to older workers.

Variant 4 assumes that wages of young workers 20 years old will increase by 9 percent relative to the average wage between 1995 and 2020. A worker 45 years old will experience an average rise in wages. Wages of older workers 60 years old will lag the average by 10 percent.[7] The flattening of the age profile of earnings dampens the rise in tax revenues due to a change in the composition of the labor force toward older workers with higher wages. Hence, it reduces the improvement in the generational imbalance brought about by higher pension incomes and a higher participation rate. Indeed, variant 4 shows a slight rise of the generational imbalance (compared to variant 3) to $24,300, or 4.7 percent of lifetime income (see table 14.1).

The Preferred Case

We believe variant 4 best reflects the impact of future developments on the intergenerational stance of current fiscal policies. Table 14.2 and figure 14.5 provide more detailed information on the differences between the standard variant 1 and our preferred variant 4. Table 14.2 indicates how the additional tax payments in variant 4 are distributed over currently living generations (in present value terms). Figure 14.5 shows the additional current contributions of each age group to the budget in 2020 (in variant 4 compared to variant 1).

14.4.2 Sensitivity Analyses

Interest and Growth Rates

Table 14.5 shows how sensitive the results are with respect to interest and productivity growth rates. A higher interest rate tends to lower the generational imbalance as measured by the difference in the present value of taxes paid by future generations and newborns. The opposite holds for higher productivity growth. However, the dependency on these factors is typically reversed if the generational imbalances are expressed as ratios of the present value of lifetime incomes.

7. These assumptions are based on the "European Renaissance" scenario in CPB (1992) and Deelen (1995).

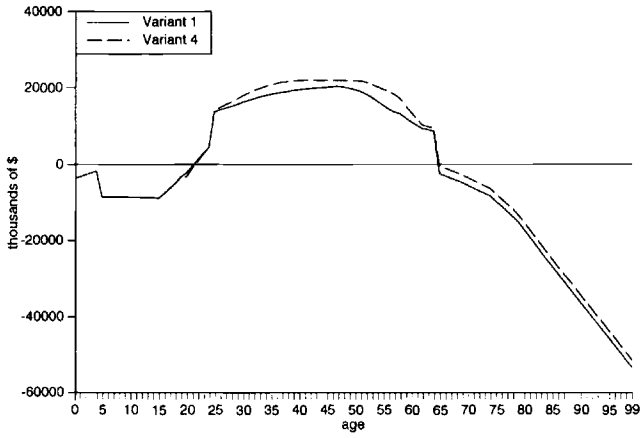

Fig. 14.5 Age profile of total net taxes in 2020: variants 1 and 4

Labor Force Participation

The variants discussed in subsection 14.4.1 employed a base-case assumption for the expected growth of labor force participation. However, in view of the considerable uncertainty surrounding this variable, CPB has constructed two alternative scenarios for the future development of the participation rate (see table 14.3).[8] All three scenarios involve an increase in participation. Whereas the "low" case projects only an accumulated 2 percent growth until 2020, the "high" case involves an accumulated growth of 15 percent. This compares to 10 percent growth in the base case.

Table 14.6 reveals that the generational imbalance is rather sensitive to labor supply. Indeed, in the scenario featuring high labor participation, the additional labor supply offsets the effect of aging so that future generations actually contribute less to the budget than newborns do. This reveals that a high level of labor supply is an important factor in supporting sustainable public finances.

Demographic Developments

Table 14.7 explores the sensitivity of the generational accounts with respect to demographic assumptions. Column (2) of the table contains the accounts if the age structure remains constant. It reveals that without aging, future generations would benefit substantially more from the budget than present generations do. In particular, compared to current generations, they would enjoy an additional lifetime *benefit* of $84,000 (16 percent of lifetime income). This compares with an additional *burden* of $24,000 (4.7 percent of lifetime income) if the prospective change in age structure is taken into account. This contrast reveals that aging puts a heavy burden on public finances. These

8. Pomp (1996) describes how these scenarios are constructed.

Table 14.5 **Generational Accounts (present value in thousands of U.S. dollars)**

	$g = 1$			$g = 1.5$			$g = 2$		
	$r = 3$	$r = 5$	$r = 7$	$r = 3$	$r = 5$	$r = 7$	$r = 3$	$r = 5$	$r = 7$
Variant 1									
Newborns	115	34	4	143	49	3	173	67	12
Future generations	226	117	70	267	137	79	313	161	90
Generational imbalance									
In dollar terms	111	83	66	124	88	76	140	94	78
As a percentage difference	96	239	1,717	87	177	2,355	81	140	664
As a percentage of lifetime income	13.5	18.0	20.7	12.6	17.1	22.8	11.7	15.7	21.1
Variant 4									
Newborns	149	47	2	186	66	10	228	88	20
Future generations	182	70	30	225	90	37	279	114	47
Generational imbalance									
In dollar terms	33	23	28	39	24	27	51	26	27
As a percentage difference	22	48	1,763	21	37	270	22	30	130
As a percentage of lifetime income	4.0	5.0	8.8	4.0	4.7	8.1	4.3	4.4	7.3

Note: g is productivity growth (percent); r is discount rate (percent).

Table 14.6 Sensitivity Analysis: Participation Rate (thousands of U.S. dollars)

	Low Participation	Average Participation (variant 4)	High Participation
Net taxes of			
Newborns	60.2	65.8	74.3
Future generations	115.4	90.1	67.2
Generational imbalance			
In dollar terms	55.2	24.3	−7.1
As a percentage difference	92	37	−9
As a percentage of lifetime income	10.8	4.7	−1.8
Average GDP growth rate in 1995–2020	1.8	2.1	2.4

Table 14.7 Sensitivity Analysis: Demographics (thousands of U.S. dollars)

	Variant 4 (middle birthrate, high life expectancy) (1)	No Change in Age Structure (2)	Low Birthrate, High Life Expectancy (3)	High Birthrate, Low Life Expectancy (4)
Net taxes paid by				
Newborns	66	90	66	67
Future generations	90	6	87	84
Generational imbalance				
In dollar terms	24	−84	21	17
As a percentage difference	37	−93	32	26
As a percentage of lifetime income	4.7	−16.4	4.1	3.3

results underscore the merits of the forward-looking quality of intergenerational accounting.

The assumption of a constant age structure, while useful for analytical purposes, is clearly not realistic. To further pursue the sensitivity analysis with respect to demographic developments, we employ alternative demographic scenarios provided by Statistics Netherlands. In particular, we construct two variants with rather extreme assumptions for the aging of the population. To analyze the impact of substantial aging, the first variant combines the assumption of a low birthrate with that of high life expectancy. The other variant considers the other extreme case by assuming that a high birthrate coincides with low life expectancy. Table 14.8 displays the effects of these alternative assumptions on the elderly dependency ratio. Columns (3) and (4) of table 14.7 show that the consequences of alternative demographic assumptions for the genera-

Table 14.8 **Elderly Dependency Ratios, 1995–2060**

Year	Base Case (middle birthrate, high life expectancy)	Alternative Assumptions	
		Low Birthrate, High Life Expectancy	High Birthrate, Low Life Expectancy
1995	.20	.20	.20
2020	.31	.32	.29
2040	.45	.46	.40
2060	.40	.42	.33

Source: Statistics Netherlands.

Note: Elderly dependency ratio is the number of people aged 65 or older as a percentage of the number of people aged 18 to 64.

Table 14.9 **Sensitivity Analysis: Health Care Costs (thousands of U.S. dollars)**

	Variant 4 (1)	Additional Cost Rise between 1998 and 2020 (2)	Shift of Age Profile (3)
Net taxes paid by			
Newborns	66	57	67
Future generations	90	120	80
Generational imbalance			
In dollar terms	24	62	13
As a percentage difference	37	109	20
As a percentage of lifetime income	4.7	12.1	2.5

tional accounts are relatively minor. The imbalance falls to 4.1 percent of lifetime income in the first case and to 3.3 percent in the second.

The Costs of Health Care

The assumption that (age-specific) costs of health care will grow in line with productivity might not be realistic. In particular, an increase in the relative price of health care services combined with low price elasticity for these services might boost the growth of these expenditures (the so-called Baumol effect). A high income elasticity of health care could further reinforce this cost increase. Table 14.9 explores how sensitive the generational accounts are with respect to the future development of publicly financed health care. We assume no corresponding tax increase and therefore a shift of these additional costs to future generations. Column (2) of the table reveals that an additional increase in the cost of publicly provided health care of 1 percent per year during the period 1998–2020 substantially widens the generational imbalance from 4.7 to 12.1 percent of lifetime income.

Our analysis has assumed that the age profile of health costs is not affected by the increase in life expectancy. An alternative assumption is that as life expectancy rises, an increased portion of the elderly experience good health (see Organization for Economic Cooperation and Development 1996). In that case, the consumption of health services is concentrated more in the period immediately before death. To explore the sensitivity of the generational accounts with respect to alternative assumptions in this respect, we shift the age profile of the cost of health care for the elderly by assuming that these costs are directly related to the number of deaths. In particular, from age 60 on, the age profile of health care is shifted by an increasing margin until it reaches at age 70 a maximum of 1.6 years, being the expected increase in life expectancy. This shift is assumed to occur gradually between 1998 and 2020. Column (3) of table 14.9 shows that a healthier elderly population would reduce the generational imbalance to 2.5 percent of lifetime income.

14.4.3 The Benefits of Government Purchases

The standard practice in generational accounting does not assign the benefits of government purchases to generations. Moreover, it does not distinguish between public consumption and public investment. This section modifies this practice. In particular, we evenly assign over all currently living generations the benefits of both government consumption[9] and the public capital stock. These latter benefits are computed as an imputed rent from the public capital stock.[10]

This alternative treatment of investment improves the generational imbalance significantly (see variant 5 in table 14.10). In fact, the public finances turn out to be almost sustainable: the net contribution of newborns almost equals that of future generations. The main reason for the further improvement in the generational imbalance is that the present level of public investment exceeds the level that is needed to have the public capital stock grow in line with the growth of the economy.

With the assignment of the incidence of government purchases, the net tax burden on future generations measures fiscal "debt" shifted to future generations.[11] Table 14.10 reveals that future generations receive a net benefit from the government of $64,100, or 12.5 percent of lifetime income. Accordingly, current and past generations do not appear to employ fiscal policy to impose a burden on future generations.

9. We assume here that aggregate benefits correspond to the value of spending.

10. In particular, we compute the imputed rent as depreciation plus the product of the interest rate and the public capital stock. The initial stock of government wealth includes the physical capital stock of the government.

11. This is the level measure discussed in the introduction. If we do not assign the benefits from these purchases to generations, the level of the tax burden measures not only this "debt" but also the level of government purchases.

Table 14.10 **Assigning the Incidence of Government Purchases (thousands of U.S. dollars)**

	Variant 4 (not assigning benefits)	Variant 5 (assigning benefits)
Net taxes paid by		
Newborns	65.8	−65.9
Future generations	90.1	−64.1
Generational imbalance		
In dollar terms	24.3	1.8
As a percentage difference	36.9	2.7
As a percentage of lifetime income	4.7	0.4

Table 14.11 **Policies to Achieve Generational Balance: Variant 4**

	Immediate and Permanent Change in Item	
Item	% of Item Itself	% of GDP
Government purchases[a]	−7.9	−1.0
All taxes	2.4	1.0
Income tax	4.3	1.1
Transfer payments net of taxes	−6.1	−1.0
Health	−9.9	−.9
Education	−24.0	−1.1

Note: Real income growth assumed to be 1.5 percent; discount rate, 5 percent.

[a]Government purchases comprise expenditures on defense, general government, and government investment.

14.5 Generational Impact of Alternative Policies

The first part of this section explores a number of policy reforms designed to eliminate the generational imbalance. The second part analyzes the effects of some policy measures that are currently under debate in the Netherlands to contain the burden of aging on the public finances.

14.5.1 Establishing Generational Balance

Table 14.11 indicates the required adjustments for ensuring sustainable public finances by establishing generational balance in our preferred case (variant 4; see subsection 14.4.1). It explores this adjustment for a number of budget items in turn. As could be expected from the small generational imbalance in variant 4, the required policy changes are modest. Indeed, an (immediate and permanent) adjustment in one of these budget items of about 1 percent of GDP would suffice.

Table 14.12 **Effects of Balancing Measures on Tax Burden Borne by Several Generations (present value in thousands of U.S. dollars)**

Item	Future Generations	Newborn	30-Year-Old	60-Year-Old
Government purchases	−24.3	0	0	0
All taxes	−18.6	5.7	8.9	3.2
Income tax	−18.4	5.9	9.2	2.4
Transfer payments net of taxes	−19.4	4.8	7.0	8.1
Health	−19.6	4.7	6.3	8.6
Education	−9.7	14.6	0	0

These required adjustments, when expressed as percentages of GDP, are about the same for all budget items—irrespective of their age profiles. Table 14.12, however, indicates that the measures yield quite different effects on the level of welfare of the various generations. In particular, future generations benefit most from changes in budget items affecting the end of the life cycle, such as health and transfer payments.

14.5.2 Effects of Measures Currently under Debate

In order to reduce the burden of aging on the public finances, Dutch politicians are discussing several policy reforms. This subsection investigates the impact of these reforms on the sustainability of public finances and the net tax burden on future generations.

Taxing the Elderly

Individuals over 65 years of age are currently exempt from contributing to a number of social security schemes, including the public old-age scheme. It has been suggested that the elderly with supplementary occupational pensions should contribute to the public old-age scheme. In this way, not only the young but also the elderly with higher incomes would help to finance the flat public pension benefit. For the elderly, the net effect of the measure is an income tax rise of 40 percent and a reduction in indirect taxes paid of 8 percent. Table 14.13 shows that gradually abolishing the exemption between 1998 and 2020 reduces the generational imbalance by 42 percent. Suddenly eliminating the exemption in 1999 reduces this imbalance by 52 percent by harming those who are currently close to retirement (see the effect on 60-year-olds in table 14.13).

Additional Public Saving

Another policy option currently under debate is to accumulate a social security fund designed to finance some of the additional public pensions for the baby boom generations. We assume that this fund is accumulated by additional public savings rather than a higher deficit in the rest of the public accounts. Hence, this policy package resembles the measures analyzed in subsection 14.5.1. Here we assume that beginning in 1999, indirect taxes are raised by 1.5

Table 14.13 **Taxing the Elderly (thousands of U.S. dollars)**

	Variant 4	Taxing the Elderly Gradually	Taxing the Elderly Immediately
Taxes paid by			
60-year-olds	−40.3	−36.5	−32.0
30-year-olds	245.4	248.7	248.7
Newborns	65.8	67.2	67.2
Future generations	90.1	81.3	78.8
Generational imbalance	24.3	14.1	11.6

Table 14.14 **Raising Public Saving (thousands of U.S. dollars)**

	Variant 4	Higher Indirect Taxes
Net taxes paid by		
60-year-olds	40	40
30-year-olds	245	247
Newborns	66	67
Future generations	90	86
Generational imbalance		
In dollar terms	24	19
As a percentage difference	37	29
As a percentage of lifetime income	4.7	3.7

billion guilders (0.21 percent of GDP). This measure turns out to have only a rather small effect on the generational imbalance of 1.0 percent of lifetime income. (See table 14.14.)

14.6 Conclusion

This paper has provided two main contributions. Its methodological contribution has been to show how generational accounting can accommodate prospective changes in the economic environment in the form of an increasing participation rate, higher pension incomes, and a flatter age-earnings profile. Its second main contribution involves the computation of generational accounts for the Netherlands. The analysis indicates that the main factors affecting the intergenerational stance of present Dutch fiscal policies are the aging of the population, the expected rise in future labor participation rates, rising incomes from private pensions, and high levels of public investment. The first factor threatens the sustainability of public finances and imposes a burden on future generations. The other factors help to reduce this burden. The race between these factors appears to end close to a tie. The additional human capital of women and the additional financial assets of pensioners more or less offset

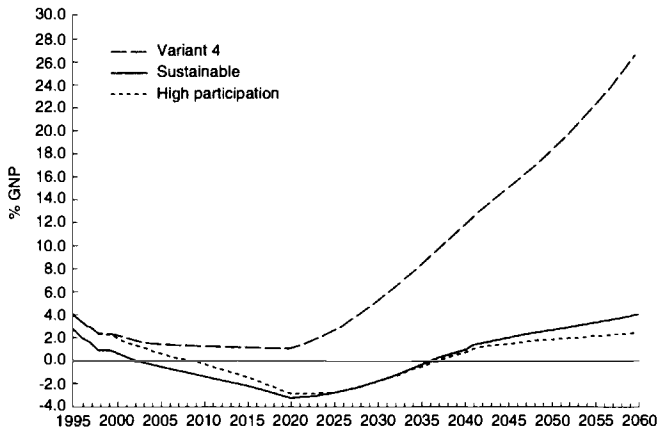

Fig. 14.6 Budget deficits: variant 4, sustainable, and high participation

the aging of the population. This rather optimistic conclusion requires three important caveats.

First, since the rise in participation occurs before the bulk of the aging, the government will have to reduce the deficit in the next two decades to create room for higher age-related spending in later decades. Figure 14.6 indicates how the budget deficit will develop in the period until 2060 in our preferred variant 4. It reveals that present policies produce a soaring deficit, mainly due to an explosion of interest payments. This reflects the unsustainability signaled by the generational accounts. In figure 14.6 we show also how the deficit develops when indirect taxes are raised by an amount that suffices to secure a sustainable policy. In that case, the fiscal balance goes into surplus by 2002. Subsequently, it remains positive for about three decades in order to finance age-related spending.

Second, the results are highly sensitive to projected labor force participation. Figure 14.6 demonstrates this by showing how the deficit develops in the high-participation case, which we referred to in subsection 14.4.2. It indicates that a policy aimed at raising labor force participation seems of great importance in order to ensure the sustainability of the public finances in an aging society. Accordingly, the government may want to stimulate labor supply by further cutting taxes. This would require additional spending cuts.

Third, our analysis does not include intergenerational redistribution occurring outside the government sector, for example, environmental externalities, inheritances within families, and transfers of know-how. Moreover, we do not explore the intergenerational redistribution performed by supplementary, occupational pension schemes. Table 14.4 indicates that these schemes play a major role in the Netherlands. If interest rates turn out to be low compared to the growth rate, these defined-benefit schemes may have to tax the young genera-

tions in the form of higher pension premiums in order to provide pension benefits to the elderly.

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