

# The Public Reallocation of Resources across Age: A Comparison of Austria and Sweden



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## Abstract

There is a strong interdependency between public transfers and the shape of the economic life-cycle. Austria and Sweden are very similar economies in terms of production, income and the size of the public sector. There are however remarkable differences in the design of public transfers, their distribution over age-groups and consequently in the shape of the average economic life-cycle: One of the most remarkable differences is the earlier labour force exit age in Austria. The period of active labour force participation is consequently more compressed in Austria, leading to higher contributions to the public transfer system for the age-groups 20-45 and to a higher share of public transfers directed to the elderly. Using economic dependency ratios we show that the sustainability of the public transfer system depends less on its size than on its design: The Swedish system collects the contributions from a wider range of age-groups, transfers a smaller share to the elderly and provides more support to younger generations, supporting them to invest in own children. These characteristics have a positive effect

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on the sustainability of the Swedish system: Although in Sweden there is a larger share of the population in the age-group 60+, the total economic dependency of the elderly is lower.

## 1 Introduction

Low fertility together with increasing survival to old age will shape the future age structure of the population and in particular also the size and age structure of the labour force in Austria. These trends are reinforced by the baby boom generation which will start retiring in the next years. In addition to these demographic conditions, institutional settings of the labour market have led to a decrease in the working life span during the last decades. Later entry into the labour force accompanied with early retirement ages have further reduced the labour supply. Faced with these demographic and institutional conditions that raise the ratio of retired to working people in Austria, it is important to investigate the role of the public transfer systems for the reallocation of resources across ages. While most studies focus on the sustainability of the pension system, we are interested in the reallocation of resources across the whole age group. In particular we are interested in the in- and outflow of public resources at all ages and how these are shaped by the institutional settings. While outflows are mainly measured in terms of taxes levied on workers and consumers, public inflows range from child support, educational investment, unemployment insurance, sick leave to pension payments and elderly care. Based on data from the National Transfer Accounts (Lee and Mason, 2011), the aim of our paper is to study age reallocation of public transfers in Austria in comparison to Sweden, a country similar to Austria with respect to the economic output and the extend of the welfare state, but nevertheless quite differently in its design of the age specific allocation of public transfers.

Austria and Sweden are both highly developed welfare states with a similar level of production and income and with a large public sector: The purchasing power adjusted GDP per capita in 2010 was €30,891 in Austria and €30,433 in Sweden<sup>1</sup>, government expenditure amounted to 52.5 percent of GDP in Austria and 52.3 percent in Sweden<sup>2</sup>. However, there are remarkable differences between the two countries in the way they finance public expenditures: While in 2010 Sweden financed government expenditures by revenues amounting to 52.5 percent of GDP and has been running a small surplus, tax revenues in Austria amounted to 48.1 percent of GDP and fell short of expenditures, a gap which has been covered by a public deficit of 4.5 percent of GDP. Austria and Sweden also differ markedly in their shape of the average economic lifecycle, i.e. in their level and type of production

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<sup>1</sup>All monetary values are given in Purchasing Power Standards (PPS): PPS are an artificial currency with the same purchasing power in each country. One PPS-Euro has the average purchasing power of one Euro in the European Union (European Communities, 2008).

<sup>2</sup>Source: Eurostat, Government finance statistics.

and consumption at each age. Since public transfers are closely linked to the shape of the economic lifecycle, the public sectors in Austria and Sweden therefore differ in the way they are redistributing resources among age groups. Combining the age specific reallocation of resources with the projected demographic structure, we can then compare the development of the ratio of public expenditures to revenues for the future. Such a simple shift-share analysis may yield a first insight in the sustainability of the current public transfer system in Austria as compared to Sweden.

The paper is structured as follows. In the following section we give an overview of the economic life cycle in Austria and Sweden based on the most recent data from the National Transfer Account project (Lee and Mason, 2011). In Section 3 we review public transfers in Austria as compared to Sweden. We first present aggregate numbers and then focus on the age specific shape of net public transfers in both countries. Applying the concept of the Lorenz curve we investigate whether transfers are biased towards specific age groups. Based on these data we provide projections of economic dependency ratios for Austria and Sweden up to 2040 in Section 4. In the final section we summarize our findings.

## 2 The Economic Life-Cycle in Austria and Sweden

The economic life-cycle describes and measures the age-specific type and intensity of economic activities. Although there is a large variation in the shape of individual economic life-cycles, country specific economic activities at each age are strongly influenced by national institutions. The age at first labour market entry for example is influenced by the national education system and the local conditions on the labour market. In most countries the retirement age is more or less determined by the public pension system while the usage of health and care services is strongly influenced by the health- and social protection system. The age-reallocation of resources through the public sector plays a particular important role in enabling periods of economic dependency in young and in old age.

To study the differences in the economic life-cycle between Austria and Sweden we compare age specific average economic activities between both countries. Our comparison of Austria and Sweden is based on data from the National Transfer Accounts project (Lee and Mason, 2011). National Transfer Accounts (NTA) measure for a certain year how much labour- and asset income each age-group generates, how income is subsequently redistributed across age-groups through public and private transfers and how each age-group uses the disposable resources for consumption and saving. NTA introduce age into the System of National Accounts (SNA) by distributing central quantities in the SNA such as incomes, consumption,

taxes/social contributions and social benefits to age groups. National Transfer Accounts additionally contain estimates for intra-household transfers, e.g. transfers from the parents to the children. The dataset consists of age-profiles of the above mentioned variables, which contain the average per-capita values for each age-group. As base year we use 2010, so all the quantities are adjusted to the SNA values from this year. However, for Sweden there is SNA data, but no National Transfer Accounts data available for 2010. We therefore use the NTA age-specific data from 2006 and adjust them to the aggregate values of 2010. The Swedish data has been provided by the local NTA-team, a detailed description of the Swedish data can be found in Forsell et al. (2008).

Table 1 gives an overview of the components of income and its use in Austria and Sweden. The NTA Net National Income at basic prices corresponds largely to Net National Income (NNI) at basic prices as it is usually defined in National Accounts. It can be derived from GDP by adding also net primary income from the rest of the world and subtracting the Consumption of Fixed Capital and the Taxes on Products. The Net National Income at basic prices is a measure for the amount of resources which are available in the economy before transfers are implemented. NTA distinguish only between two sources of income; labour income and asset income. Labour income includes mainly the Compensation of Employees, while asset income comprises the Net Operating Surplus. Mixed Income generated by unincorporated enterprises is allocated to these two sources – two third to labour income, one third to asset income. Although per capita GDP is higher in Austria, the per capita NNI at basic prices is higher in Sweden. One of the reasons is that Sweden receives a positive net property income from the Rest of the World (ROW); Austria is paying property income to the ROW, mainly in form of interest payments on public debt. Because asset income consists mainly of property income its share on total income is consequently higher in Sweden with 25 percent, as compared to Austria with 23 percent. Part of the income is transferred to other countries, in form of social benefits paid to non-residents, taxes paid to the European Union (GNP based fourth own resource) and international cooperation such as contributions to international organizations and foreign aid. The higher involvement of Sweden in the latter activities explains the higher value in this category. There are considerable differences how the disposable income is used: The savings rate (Net Saving relative to Disposable Income) in 2010 was higher in Sweden with 16.1 as compared to Austria with 12.1 percent. This difference can be explained by the dissaving of the public sector in Austria: In 2010 the savings of the private sectors was about 14.6 percent of disposable income in both countries, but the public sector in Sweden has been saving 1.5 percent of

total disposable income while the public sector in Austria had to finance expenditure of about 2.6 percent of disposable income through dissaving. Also the share of public and private consumption differ between the two countries: While in Sweden 43 percent of total consumption expenditure is public consumption, the share of public consumption is only 30 percent in Austria.

**Table 1:** The Generation and Use of Income 2010 in Euro (PPS)

	SWE	AUT
<b>Net National Income (NNI) at Basic Prices</b>	<b>23,078</b>	<b>22,819</b>
Labor Income in % of NNI	75	77
Asset Income in % of NNI	25	23
<b>Transfers from the Rest of the World</b>	<b>-421</b>	<b>-223</b>
<b>Disposable Income (DI) at Basic Prices</b>	<b>22,657</b>	<b>22,596</b>
Consumption Total in % of DI	83.9	87.9
Private Consumption in % of Total Cons.	57.2	69.9
Public Consumption in % of Total Cons.	42.8	30.1
Saving Total in % of DI	16.1	12.1
Private Saving in % of Total DI	14.6	14.7
Public Saving in % of Total DI	1.5	-2.6

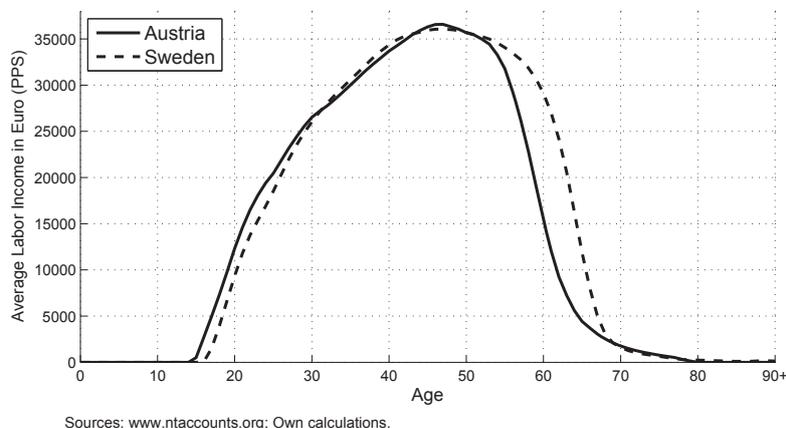
*Sources:* Eurostat, European sector accounts; Own calculations.

Important economic activities that differ by age are the generation of income through own labour and consumption. In most developed economies the generation of labour income is concentrated in the age-groups between 20 and 65 with large cross-country differences in the age-groups 55-plus. While the age-variation is smaller for total consumption, the type of consumption goods varies considerably: The consumption of education goods and services is concentrated in the age-groups between 6 and 25, the consumption of health and long-term-care services in the age groups 65+. The differences between Austria and Sweden in labour income and consumption by age are analysed in the following two sections.

## 2.1 Labour Income

There are pronounced differences in the average labour income by age-group (Figure 1). Austrians start generating labour income at a younger age than Swedes do. One of the reasons is the vocational education system in Austria, in particular the apprenticeship-track which combines in-firm training and schooling. Around one third of a cohort enters the labour market through this track of upper secondary education and starts generating labour income already at the age of 15. A similar track in Sweden is much less developed,

**Figure 1:** Age-Group Averages of Labour Income 2010



vocational upper secondary education is mainly school based. Another reason why Austrians enter the labour market at younger ages is the much lower youth unemployment rate: The unemployment rate for under 25 year old in 2010 was 8.8% in Austria but 25.2% in Sweden<sup>1</sup>. The most pronounced differences in the labour income age-profiles however are found in the age-groups from 55 to 64, reflecting the much earlier exit from the labour force in Austria. The effective age of labour market exit for the period 2004-2009 was 58.9 for Austrian men, 66 for Swedish men, 57.5 for Austrian women and 63.6 for Swedish women<sup>2</sup>. These patterns of labour force entry and exit ages clearly affect total labour income: The age-group 55+ generated 23 percent of total labour income in Sweden, but only 13 percent in Austria.

The labour income age-profiles are mainly shaped by the labour force participation rates, which are shown for men and women in Table 2. From these numbers it is evident that Austrians exit the labour market at a much younger age than Swedes. Gender differences are higher in Austria, caused by the lower participation rate of women: With the exception of the very young the participation of women is higher in Sweden than in Austria, although part-time work is more common in Austria (46.2% of all employed women vs. 35.9% in Sweden<sup>3</sup>) and the fertility rate is lower (1.44 as compared to 1.98 in Sweden<sup>4</sup>).

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<sup>1</sup>Source: EUROSTAT

<sup>2</sup>Source: OECD, Pensions at a Glance 2011: <http://dx.doi.org/10.1787/888932370341>

<sup>3</sup>Source: EUROSTAT, Part-time work as percentage of total employment 2010

<sup>4</sup>Source: EUROSTAT, Fertility 2010

**Table 2:** Partizipation Rates by Age in Percent 2010

Age	Sweden		Austria	
	Women	Men	Women	Men
15-24	51.2	51.7	54.1	63.6
25-54	87.5	93.6	82.8	92.5
55-59	82.0	88.3	52.3	73.3
60-64	58.8	70.8	14.8	30.7
65+	7.7	16.7	3.6	7.7

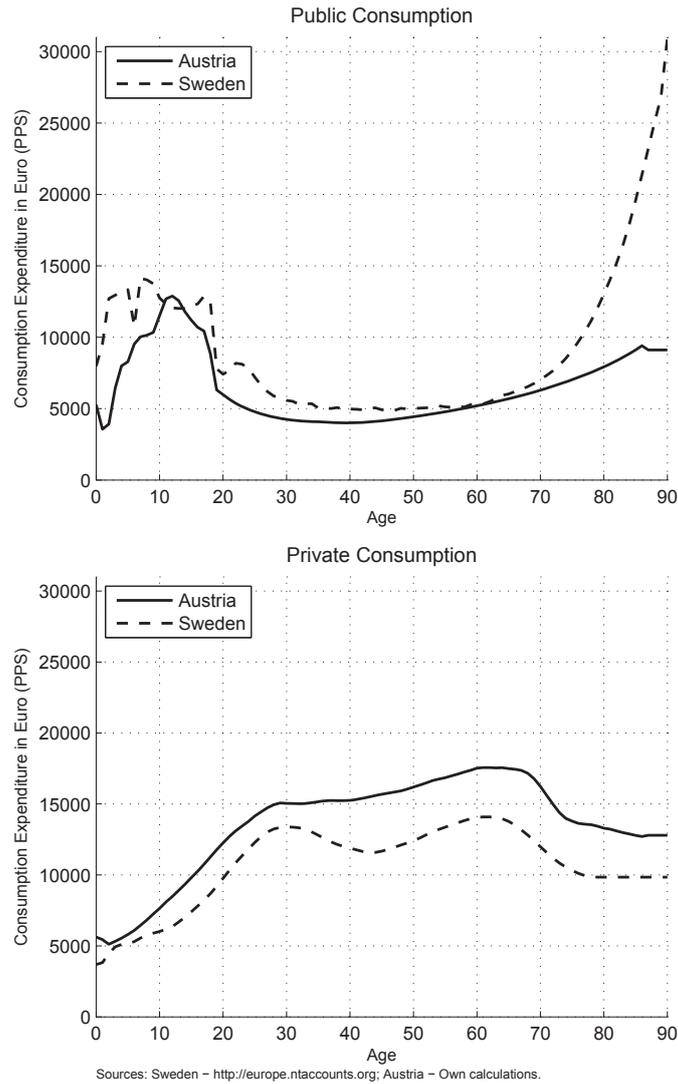
*Source:* OECD

## 2.2 Consumption

Consumption age-profiles of developed economies indicate some unique pattern: Public consumption expenditure is high in childhood and for young adults due to publicly provided education and is high again in old age where the use of public health and long-term-care services increases. The age-groups between 20 and 60 profit mainly from collective consumption of public goods that are provided independent of age, such as administration and defence. Overall, private consumption is a substitute to public consumption; it is low in childhood and for the elderly and peaks around the age of 30 and between ages 55 and 65. Though average per capita income increases in the age group from 30 to 50, consumption expenditure stays constant or decreases in these ages since the presence of children implies that available resources have to be distributed over a larger number of persons.

There are however also evident differences between Austria and Sweden. These are the higher consumption relative to disposable income in Austria and the higher share of public consumption on total consumption in Sweden (Table 3). Part of the higher share of public consumption in Sweden can be attributed to the higher expenditure on child-care and preschool-education. But in Sweden the share of public consumption is also higher for all other age-groups. This can be explained with the slightly larger public sector in Sweden and with the type of transfers: Public transfers in Sweden are mostly in-kind transfers and as such part of public consumption. Austria applies much more cash benefits which enable the beneficiary to buy the services on the market (long-term-care allowance) or with the purpose of compensating people for the provision of services which are important for the community (childcare allowance). The use of cash transfers is discretionary; a part might be used for saving or for private transfers, the bulk of the cash transfers however is finally used for private consumption.

**Figure 2:** Age-Group Averages of Public and Private Consumption 2010



**Table 3:** Public Consumption 2010

	Sweden		Austria	
	Euro (PPS)	% of Total Cons.	Euro (PPS)	% of Total Cons.
<b>Public Consumption</b>	<b>8,138</b>	<b>42.8</b>	<b>5,977</b>	<b>30.1</b>
Health	2,039	10.7	1,681	8.5
Education	1,934	10.2	1,536	7.7
Pre-Primary and Primary	1,195	6.3	399	2.0
Secondary Education	419	2.2	775	3.9
Tertiary Education	258	1.4	160	0.8
Education Other	62	0.3	202	1.0
Social Protection	1,773	9.3	416	2.1
Other	2,391	12.6	2,344	11.8

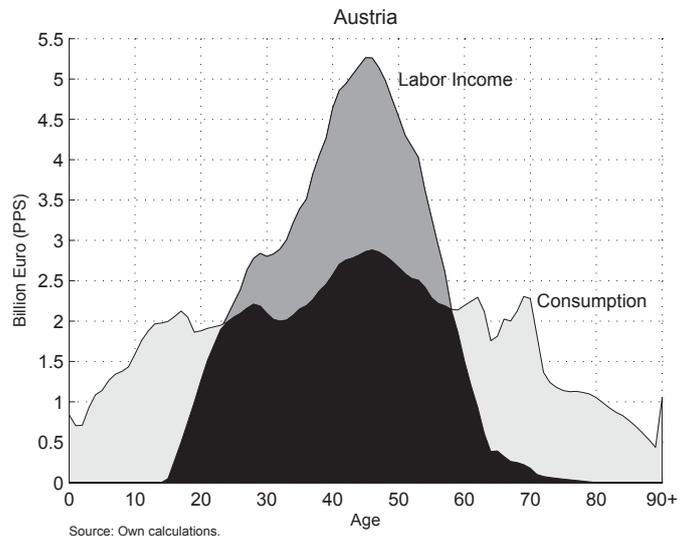
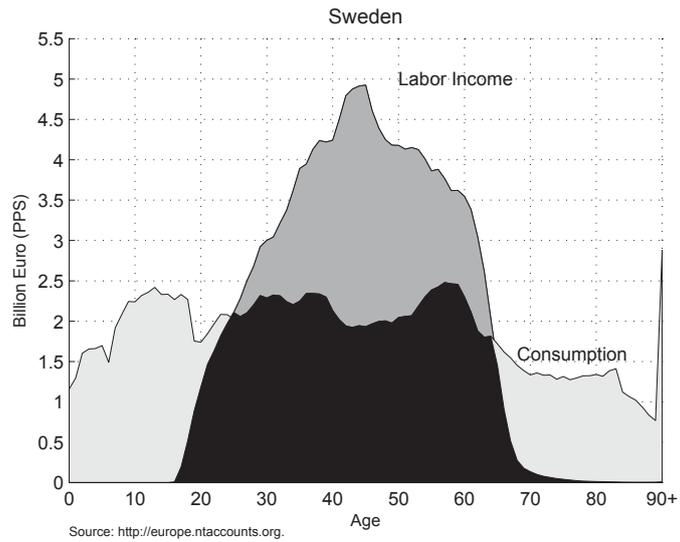
*Source:* Eurostat, General government expenditure by function (COFOG)

### 2.3 The Lifecycle Deficit

Figure 3 shows the aggregate labour income and aggregate consumption for each age group. These numbers are obtained by multiplying the per capita values of income and consumption (Figure 1 and Figure 2) with age specific population numbers in 2010. Remarkable is the concentration of labour income in Austria: More than one third of total labour income (33.8%) is generated by the age-group from 40 until 49, thus by the baby-boom generation born in the years from 1960-1969. The value for Sweden is 28.1%, labour income in Sweden is distributed over a larger number of age-groups. This can be explained by two facts: Firstly in Sweden the baby-boom was less pronounced and secondly people stay much longer in the labour force in Sweden as compared to Austrians.

The age groups of children/young adults and the age groups of the elderly consume on average more than they generate on labour income. These age groups have to finance at least part of their consumption through age-reallocations, thus through public and private transfers from other age-groups or through asset based reallocations such as asset income and dissaving. Of particular interest is a composite indicator of consumption and labour income: The lifecycle-deficit - defined as consumption minus labour income. The lifecycle deficit measures the consumption which cannot be covered by own labour income. The size of the lifecycle deficit and consequently the amount of resources which has to be reallocated over age is substantial: The total lifecycle deficit of the young amounts to 19.5 percent of total labour income in Austria and 24 percent in Sweden. The higher value for Sweden can

**Figure 3: Aggregate Labor Income and Consumption 2010**



be explained by (a) the higher number of children, (b) the higher per-capita expenditure for education and (c) by the later entrance into the labour market in Sweden. For the elderly the aggregate lifecycle deficit amounts to 19 percent of total labour income in Sweden and almost 25 percent of total labour income in Austria. The difference is due to (a) the higher consumption of the age groups 60-75 and (b) the much earlier exit from the labour force in Austria.

### 3 Public Transfers

Large parts of transfers related to social protection in old age are based on what is commonly described as a generational contract - the active population invests in children who in turn finance their care in old age. In comprehensive welfare states such as Austria and Sweden there is no direct relation between the investment in children and social protection in old age for an individual, but for whole generations this relation holds. Currently the transfer system is quite unbalanced in most welfare states: A decreasing share of workers and contributors are confronted with a growing number of beneficiaries. The public sector plays an important role in these transfers. The resources required by the elderly are almost exclusively provided by the public sector through the pension system and the public provision of health care and long term care services. But the public sector plays also an important role regarding transfers to children and younger generations: Most importantly because formal education is provided or at least financed mainly by the public sector; moreover the public sector provides incentives and support for families, thereby also influencing how much families invest in children. Adequate and well-designed transfers to the younger population can therefore enhance the sustainability of the welfare system in the long run.

Table 4 provides an overview of revenues and expenditures of the public sector in 2010. The total revenues as well as total expenditure as share of NNI were higher in Sweden than in Austria: Revenues amounted to 58.1 percent of NNI in Sweden and 55.3 percent in Austria; total expenditure on transfers to 58.7 percent in Sweden and 56.3 percent in Austria. In both countries the transfer revenues through taxes, social contributions and other transfers fell short of transfer expenditure. The public sector in Sweden however received asset income to cover the gap and finance public saving; in Austria the government had to finance additionally a negative asset income (interest on public debt) requiring additional borrowing and dissaving. Social contributions play a much larger role in Austria than in Sweden, where public transfers are to a larger degree financed by taxes. We have shown already that the share of in-kind transfers (public consumption) is much higher in

Sweden than in Austria, corresponding to 60 percent of total public expenditure. In Austria public expenditure consists to 53.4 percent of cash transfers.

**Table 4:** Public Revenues and Expenditure 2010

	Sweden		Austria	
	Euro (PPS)	%	Euro (PPS)	%
<b>Public Asset Income</b>	<b>499</b>		<b>-370</b>	
Public Transfer Revenues in % of NNI		58.1		55.3
<b>Public Transfer Revenues</b>	<b>13,407</b>	<b>100</b>	<b>12,624</b>	<b>100</b>
Taxes	10,542	78.6	7,219	57.2
Social Contributions	2,652	19.8	5,021	39.8
Other Revenues	214	1.6	384	3.0
Public Transfer Expenditure in % of NNI		58.7		56.3
<b>Public Transfer Expenditure</b>	<b>13,540</b>	<b>100</b>	<b>12,848</b>	<b>100</b>
Public Consumption	8,144	60.1	5,984	46.6
Individual Consumption	5,902	43.6	3,511	27.3
Collective Consumption	2,242	16.6	2,473	19.2
Social Benefits (Cash)	4,488	33.1	6,077	47.3
Other Transfers	909	6.7	787	6.1
<b>Public Net Saving</b>	<b>366</b>		<b>-594</b>	

*Source:* Eurostat - European Sector Accounts

The analysis of public transfers usually puts more weight on expenditures than on revenues. But the tax structure determines which age-groups are carrying the burden of financing the public transfers system. Taxes and social contributions on labour are paid by younger generations while taxes on capital affect more the older generations from age 40 onwards. In particular the high taxation of labour together with early retirement is problematic as it shifts the burden of financing the public sector to the age-groups in the "rush hour" of life, thus to those age-groups which at the same time have to invest resources into building up their homes and families. As indicated in Table 5 taxes on employment constitute in Austria with 50.8 percent of revenues a higher share than in Sweden with 48.8 percent. Sweden in turn accrues higher tax revenues from consumption taxes, labour taxes of non-employed (e.g. retirees) and on the stock of capital. The share of capital taxes is higher in Austria, mainly because of the higher share from self-employed persons.

**Table 5:** Tax Revenues by Function in Percent of Total Tax Revenues 2010

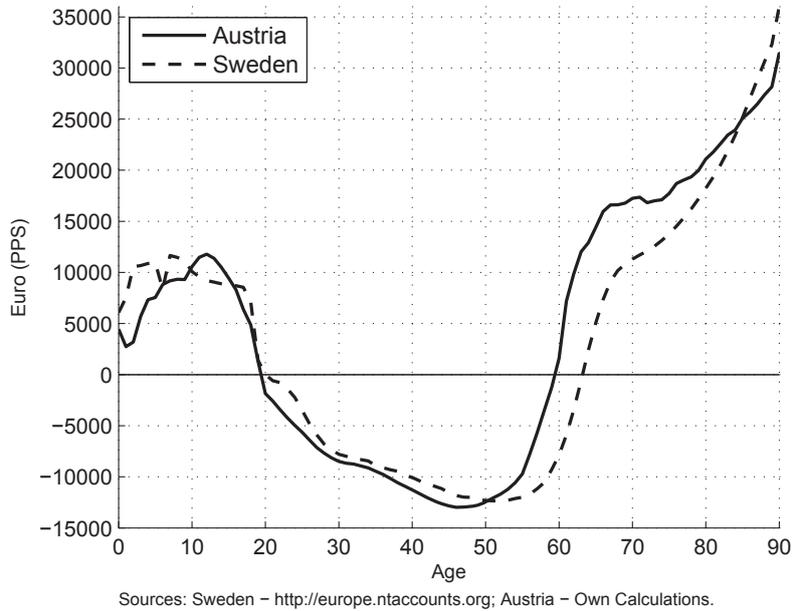
	Sweden	Austria
Labour Taxes on Employment	48.8	50.8
Labour Taxes Non-Employed (e.g. Retirees)	7.6	5.9
Consumption Taxes	29.0	28.1
Capital Taxes, on Capital and Business Income	11.5	13.0
Capital Taxes on Stock of Capital	3.1	2.3

*Source:* EUROSTAT, Structure of Taxes by Economic Function

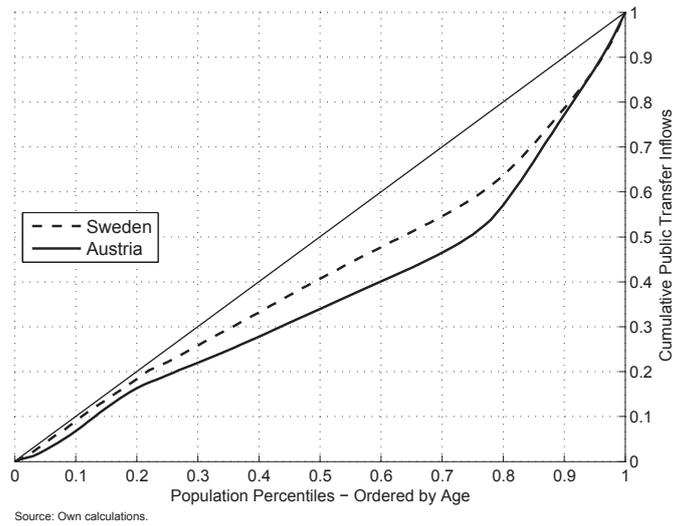
In Figure 4 we plot age specific public net transfers for Austria and Sweden in 2010. The Swedish public sector provides more resources to younger generations than the Austrian. The higher net-benefits for children in Sweden reflect the comprehensive provision of child-care facilities and the higher public consumption expenditure for education. The higher net-benefits (lower net-contributions) of Swedes as compared to Austrians in the age-groups 20-50 reflect the slightly higher taxation of labour income and the lower share of transfers which is directed to these age-groups in Austria (e.g. care and health services). Around the age of 50 this age pattern reverses: Swedes in the age-groups 50-64 provide a fundamental share of public transfers while Austrians already start to leave the labour force at those ages. The net contributions decline very fast in Austria; Austrians become net-receivers of public transfers already at the age of 59, Swedes at the age of 64. The more compressed period of labour force participation in Austria therefore influences the age distribution of contributions to public transfers, as well as the distribution of the benefits. The longer retirement requires a much higher share of total transfers to be directed to the elderly in Austria. Public transfers in Austria constitute therefore in to a much larger degree a reallocation to the elderly as compared to Sweden.

To investigate whether public transfers are biased towards the younger or elderly we apply the concept of the Lorenz curve in Figure 5. We plot the population percentiles ordered by age against the cumulative distribution of public transfer benefits. Since both curves (for Austria and Sweden) are below the 45 degree line, public transfer benefits are not evenly distributed across the age structure. However, the reallocation of public benefits is more even for Sweden. The youngest 30 percent of the population receive 27% of total public transfers in Sweden, but only 22% in Austria. On the contrary, the oldest 30% receives 45% of total public transfers in Sweden, but around 55% in Austria. Consequently we find a bias towards old age transfers in both countries which is however more pronounced in Austria as compared to Sweden.

**Figure 4: Public Net Transfers 2010**



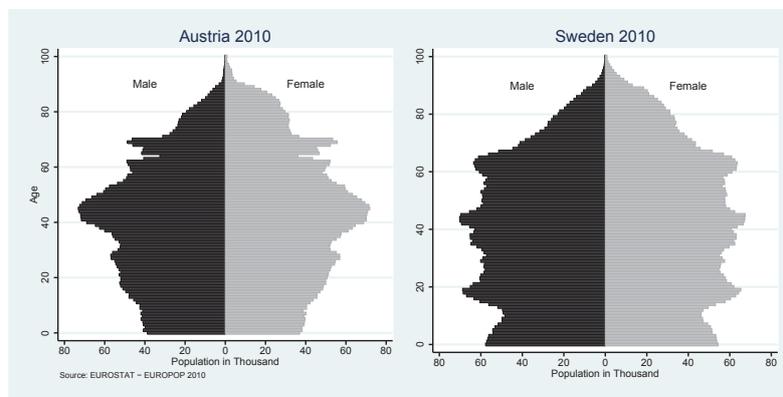
**Figure 5: Cumulative Distribution of Public Transfer Benefits**



## 4 Dependency Ratios

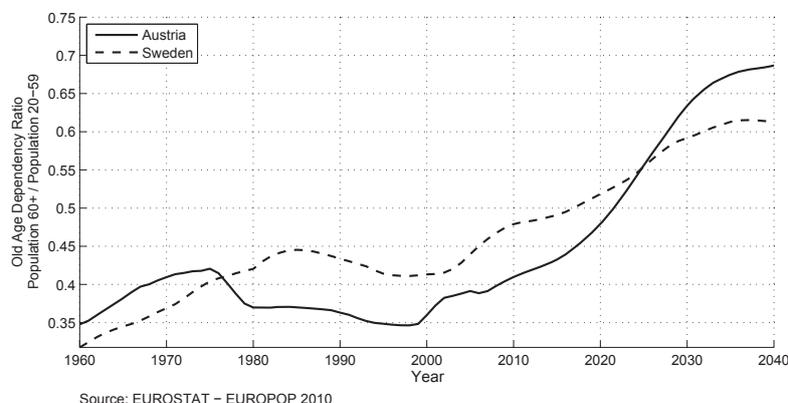
The demographic structure constitutes one of the most important factors influencing public sector revenues and expenditure: The age-structure of the Austrian population is shaped by the persistent low fertility during the last 20-30 years and the baby-boom cohorts born in the 1960s. The age-structure of the Swedish population is generally more balanced with a high share of people over the age of 60, more equally distributed population in working age and a much higher share of children and young adults (Figure: 6).

**Figure 6:** Population Pyramide



Dependency ratios are often used to describe the age structure of the population and its projected change. The old-age dependency ratio measures the ratio of the population older than 60 to the working age population from age 20 to 59. Based on the EUROSTAT population projections (European Commission and Economic Policy Committee, 2011) Figure 7 shows how this indicator developed since 1960 and is predicted to change up to 2050. For Austria there has been a decline in this ratio after 1975 as the baby-boomers entered the age-group 20-59. However, with the baby boomers leaving the labour force and entering the age groups of retirement the dependency ratio in Austria is increasing since 2000 and will further increase since smaller birth cohorts enter the prime working age from 20 to age 59. In 2040 the ratio is expected to reach 70 percent and therefore being almost twice as high as in 2000. The old age dependency ratio is also rising in Sweden but at a much lower pace. Firstly, there is currently already a larger share of the population in the age-group 60+ implying a higher dependency ratio and secondly, the baby-boom has not been as pronounced as in Austria.

**Figure 7: Dependency Ratio 1960-2040**

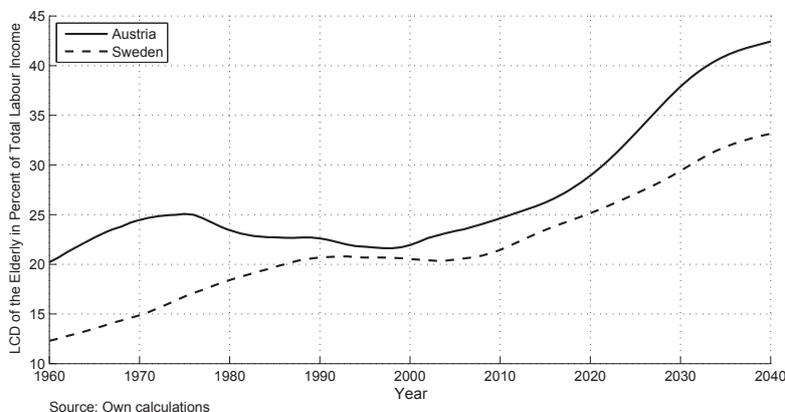


#### 4.1 Economic Dependency Ratio

The change of the demographic dependency ratio is often used to illustrate the strain on transfer systems which is induced by the demographic structure. But the extent to which the ageing of the population also implies an increase in the demand of intergenerational public transfers depends also on the distribution of contributions and benefits over age. While in Sweden the labour force participation at ages 60-64 is still high, many persons in the same age group in Austria are already retired and economically dependent. Indicators which are better suited to evaluate the economic impact of population ageing are economic dependency ratios, i.e. age dependency ratios that take into account age specific weights of consumption and labour income (Cutler et al., 1990). An example for such an indicator we have used already: The positive lifecycle deficit (LCD) of the elderly divided by total labour income. This ratio measures the consumption of the elderly (or alternatively children) which is not covered by own labour income as a share to total labour income.

In the following we assume that the per capita age-profiles of consumption and labour income are the same as in the base year (Austria 2010, Sweden 2006) and apply these profiles to population projections. Hence, we therefore present a simulation of the LCD in old age given the base-year design of the economic lifecycle. The development of this indicator between 1960 and 2040 is plotted in Figure 8. Under the assumption of the 2006/2010 economic lifecycle the LCD in Austria would have decreased between 1975 and 2000 as a result of the baby-boomers entering the labour market. However, we even overestimate its value in these years as the economic lifecycle in the 1960s was quite different: Firstly, the

**Figure 8:** Economic Old-Age Dependency Ratio: LCD of the Elderly 1960-2040



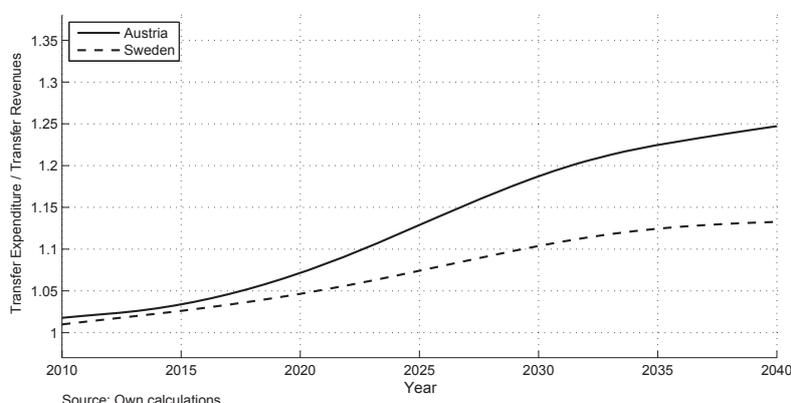
per-capita LCD for the elderly was smaller since retirement ages were higher and public benefits were less generous, and secondly, the total LCD for the elderly was smaller since life expectancy was lower at these times. In Austria the demographic dividend resulting from the entry of the baby boomers into the labour market has been used to expand the per-capita life-cycle deficit by increasing the benefit-level and decreasing the retirement age - resulting in an aggregate LCD of the elderly of around 25 percent today. From 2020 onwards the demographic dividend will turn into a demographic burden as the baby-boomers retire - the LCD of the elderly will sharply increase. For Sweden we observe a similar development but with a more moderate increase than for Austria. Figure 8 indicates that in Sweden the economic dependency ratio is lower than in Austria, despite the fact that the demographic dependency ratio (Figure 7) is higher in Sweden. This illustrates the importance of including the shape of the economic-lifecycle to correctly measure economic dependency.

#### 4.2 Economic Dependency Ratio for The Public Sector

Economic dependency ratios provide a compact measure of the economic dependency of the elderly respectively the young generations. Their use for evaluating the demographic pressure on the public transfer system is however not entirely valid as the resources for the dependent population are also provided through private transfers and asset based reallocations. To correctly illustrate the demographic pressure on the public transfer system we build up an alternative indicator that applies age-specific weights of net benefits from public sector transfers to the population structure. The net-benefits are positive for children and elderly and negative for the active age-groups which contribute more than they get out of

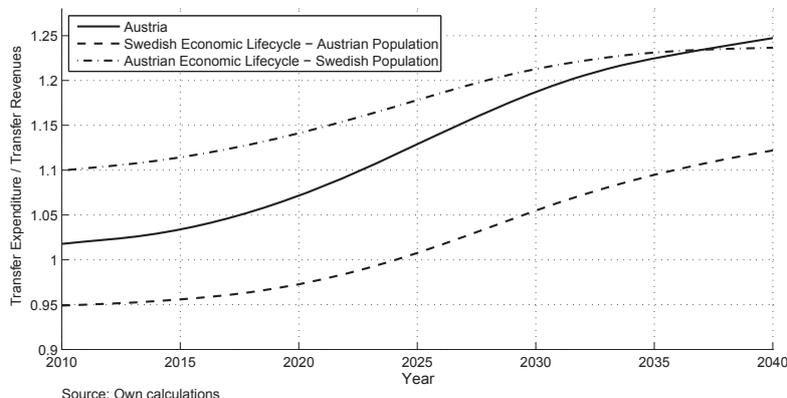
public transfers. In case that the total transfer benefits exceed the revenues this indicator will be larger than one, indicating that the public sector relies on asset income or incurs debt. A value below one would be optimal since part of the revenues could be used for investment and saving. The economic dependency ratio for the public sector is plotted in Figure 9. The public dependency ratio is higher in Austria as compared to Sweden, reflecting the larger gap between tax revenues and transfer expenditure. The pronounced increase of the indicator for Austria reflects the combination of a higher demographic burden in Austria combined with the high expenditure for the elderly.

**Figure 9:** Public Dependency Ratio



We next evaluate the effect of the demographic structure on the development of the public dependency ratio. For this purpose we run two counterfactual simulations. First we choose the Swedish economic life-cycle profiles of public net transfers and apply it to the projected Austrian age structure and alternatively we take the Austrian economic life-cycle profiles of public net transfers in combination with the projected Swedish age structure. The results of these simulations - together with the Austrian baseline indicators of Figure 9 - are plotted in Figure 10. Obviously the shape of the economic lifecycle as well as the development of the demographic structure will influence the sustainability of the public transfer system: If the Swedish age-profiles are applied to the Austrian population (dashed line), the public old age dependency ratio in 2010 decreases from a value above one in 2010 to 0.94, i.e. the public expenditures would be much lower than the revenues. Moreover, the public old-age dependency ratio would stay below the Austrian benchmark indicator over the whole projection period. The higher retirement age in Sweden as compared to Austria mainly explains these results. If alternatively we apply the population weights of Sweden to the Austrian economic life-cycle (the dash-dotted line), the public old age dependency ratio

**Figure 10:** Ratio of Expenditure to Revenues - Exchange Population Age-Profiles

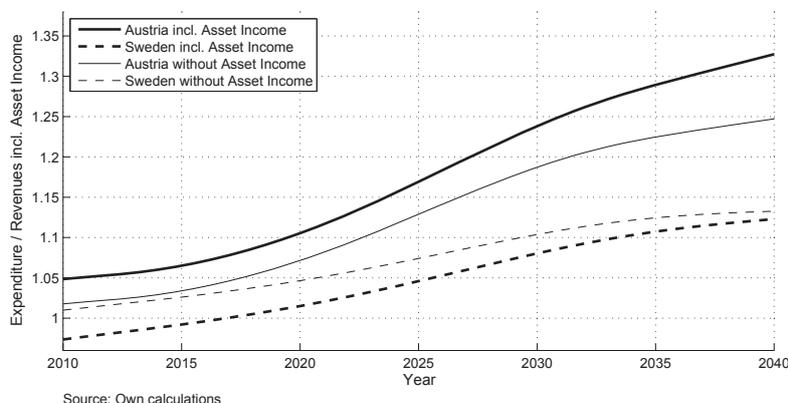


would worsen as a result of the older age structure in Sweden in 2010. However, as the pace of population ageing is lower in Sweden, the increase of the indicator would be dampened as compared to the benchmark simulations. The Austrian lifecycle together with the Austrian population development is in the long run the least favourable combination.

### 4.3 An Economic Dependency Ratio Including Asset Income

So far we have only concentrated on public reallocation of resources over age. To take also into account asset income, saving and interest payments, we need to pose assumptions on future economic growth rates and interest rates. For the following simulations we assume productivity growth at 1.5% a year, a growth rate of revenues and expenditure that equals productivity growth and a real interest rate on assets/debt of 1%. Real interest rates on 10-year government bonds have been around 2 percent in the years before 2007 and are currently negative, the 1% percent is a compromise and certainly suited to illustrate the importance of including public asset based reallocations in the indicators. Asset income (interest) in each year will of course be affected by government expenditures. If the government runs a debt, asset incomes will decline in the next period taking into account the rate of interest that has to be paid on government debts. Similar to the public dependency ratio in the previous section, we build up an indicator of the ratio of expenditure to revenues; but now also including asset income and interest payments. The development of this indicator - together with the indicator from Figure 9 - is plotted in Figure 11. For Austria, including asset income results in an increase of the public dependency indicator from slightly above one in 2010 to 1.05. I.e. around 5% of the expenditure could not be covered

**Figure 11:** Ratio of Expenditure to Revenues - Including Asset Income



out of revenues. Since the Austrian government has to run a public debt to cover public expenditures, interest payments steadily increase leading to an increasing wedge between the public dependency ratio without and alternatively with asset income. In Sweden the opposite development can be observed. Since the public sector runs a surplus, the inclusion of the positive asset income implies a reduction of the public dependency ratio once asset incomes are included.

## 5 Conclusions

Based on data from the National Transfer Accounts project we studied the economic life-cycle and the public reallocation of resources in Austria and Sweden. The most important difference between the two countries is the much higher labour force participation of older age-groups in Sweden as compared to Austria. This allows on the one hand to distribute the funding of the public transfers over more age-groups and on the other hand it decreases the need of public transfers to the elderly. In Sweden more resources are used to finance education and public investments are higher than in Austria. The early retirement in Austria leads to a compressed period of active labour force participation and consequently to a high tax-burden for the active population. Compared to Sweden in Austria the funding of public transfers is based on fewer age-groups and a larger part of public transfers is provided to the elderly. At the same time there is less public support for younger age groups. Using the economic life cycle profiles in Austria and Sweden and the projected demographic structure we studied the development of the public transfer system in both countries. Although in Sweden there is a larger share in the age-group 60-plus, economic dependency ratios illus-

trate that the economic dependency of the elderly is lower. With the baby-boom generation reaching retirement age Austria faces a huge challenge to adjust its public transfer system to the pronounced changes in the age-structure of its population.

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