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Ageing Europe – An Application of National Transfer Accounts for Explaining and Projecting Trends in Public Finances

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The Broken Generational Contract in Europe: Generous Transfers to the Elderly Population, Low Investments in Children

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Abstract:
The paper illustrates and quantifies intergenerational transfer flows in 16 EU countries using National Transfer Accounts data. In particular, it measures the age-specific value of transfers within households, including services produced by unpaid household work. These transfers play a central role in a society, but are hardly visible in official statistics. We elaborate the concept of a generational contract to show the interrelation between transfers to children and the transfers to the elderly population. Based on the transfer data, we develop and calculate a new measure of intergenerational balance of transfers. The results indicate that the patterns of intergenerational transfers are at odds with the generational contract. In most of the analyzed countries the transfers and investments in children are by far too low to finance the generous transfers to the elderly population in the future.

Keywords: Generational contract, National Transfer Accounts, intergenerational transfers

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Contents

1 Introduction

Characteristic for the human life course are periods of dependency in childhood and old age. The economic needs during these periods are largely covered through transfers from the working age population. For children, the most important transfers are clearly those from their own parents, with personal services such as care as particularly important part. In Europe, the transfers to the elderly population are predominately in form of public transfers, of which pensions and health services are the largest components. As Gal et al. (2017) emphasize, there is an asymmetry in the visibility of transfers between generations. While the public transfers to the elderly population are recorded in the central economic statistics such as National Accounts (NAs), the private transfers to children are hardly visible in official statistics. The fragmentary and highly incomplete statistical information on the private transfers is in stark contrast to the central importance of these transfers. It is mainly the parental transfers to children that create and maintain the human capital stock of a society. In particular, the transfers to children are essential for sustaining the contribution base of the public transfers system in the future.

A possible effect of the lower visibility of private transfers is that policy makers overlook and underestimate the importance of the private part of the transfer system. The working age population faces a trade-off between transfers to children, transfers to the elderly population and the own use of resources. There is the danger that a large burden through the better visible, mandatory public transfers lead to a reduction of transfers to children and an unsustainable imbalance of intergenerational transfers in the long run. There is evidence that the situation of young generations and their access to economic resources has been worsening in the last decade (Leach et al., 2016). Young generations in European countries are facing high unemployment, increasing housing costs, an increasing old age dependency ratio and consequently an increasing burden through public health care and pension costs. Understanding the full system of intergenerational transfers and accounting for public as well as private transfers is key in the organization of societies and the maintenance of the intergenerational transfer- and support system in the long run.

In this paper, we describe, quantify and analyze the intergenerational transfers in EU countries using data from two new and unique data sources, the European National Transfer Accounts (NTA) and the European National Time Transfer Accounts (NTTA). These data contain comprehensive age-specific economic information on income, transfers, consumption and saving for a given year. We use several indicators based on NTA and NTTA to quantify the transfer flows among age groups in European countries. Our particular interest is the amount and type of net transfers to children and elderly persons, distinguishing private transfers of goods and services bought

on the market, non-market transfers in form of services such as household work and care, and public transfers.

Furthermore, we conceptualize, describe and analyze the interrelation between the transfers to children and the transfers to the elderly population. For a generation to receive public transfers in old age it requires ”investments” in children in the first place, in terms of their number, their education, but also their integration into the labour market and their equipment with physical and human capital. Without sufficient investments, the generation of children will be simply not able to generate sufficient income to finance the public old age benefits of the generation of their parents. This relationship between transfers to children and the transfers to the elderly can be conceptualized as a generational contract, highlighting the reciprocity of transfer flows between generations. We develop and calculate a new measure based on NTA and NTTA to analyze if the current level of intergenerational transfers comply with the generational contract and if there is a balance between transfers to children and transfers to the elderly population. Our new measure compares the number of children that are supported by the transfers provided by one person during working age with the number of contributors that are needed to finance the total transfers for a person in old age, given the current transfer patterns. Our results show that there is a considerable imbalance in the transfer system: too little resources are used for the generation of children to enable them financing the rather generous transfers to the elderly population in the future.

The next chapter discusses the notion of a generational contract and explains the concept of generational contract that is used in this paper. We then provide an overview of our data, the European National Transfer Accounts and National Time Transfer Accounts, in Chapter 3. We use these data in Chapter 4 to quantify the level of transfers provided to children and elderly and the composition of these transfers. The measure of generational balance of transfer flows is presented in Chapter 5. This measure shows that the age pattern and levels of intergenerational transfer flows is out of balance in most of the countries. The investments in the young generation are much too small to enable the generous public transfers to the elderly population.

2 Intergenerational Transfers and the Concept of a Generational Contract

The term *generational contract* is used in different contexts and with different meaning to describe relationships and economic support between individuals belonging to different generations. Laslett (1992) describes several concepts of generational contracts and criticizes that it is seldom clear what type of generational relationships are in the mind of politicians or transfer analysts when they refer to generational

contracts. We therefore use this chapter to discuss and clarify the notion and the underlying concepts. We identified two different types of concepts of generational contracts that are used in the literature and the public discourse. One of these concepts follows the basic logic of social contracts and describes intergenerational support as a hypothetical agreement between different generations, without explicit reciprocal exchange between the contractual partners. The other concept uses the notion of a generational contract to describe intergenerational support as reciprocal, mutual exchange between individuals belonging to two different generations. Our own concept of a generational contract differs from these two approaches, and describes intergenerational support and economic transfers as mutual exchange between generations as a whole, not as exchange between the individuals. Such conceptualization enables us to account for the private and public part of the system of intergenerational support.

The Generational Contract in the Meaning of a Social Contract

The notion of a generational contract in the meaning of a social contract is often used in the public discourse to justify the obligation of the current productive generations to pay taxes and social contributions for financing pensions and health services of the older generation. It is argued that future generations provide the same service once the current productive generations retire.[1] This concept is derived from the social contract theory, in which socio-political arrangements including the state as a whole are interpreted as if they were grounded in the consent of all members of society (Kersting, 2015). The intuitive idea of a ”social” generational contract is that the redistributive mechanism of the welfare state is based on a hypothetical agreement of different generations or cohorts (Lorenz-Meyer, 1999). The concept of a social contract to justify a certain level support in old age is highly problematic, as it would be in fact a promise to expropriate the young generation sufficiently to finance these transfers to elderly population. By fixing the level of old age transfer benefits in ageing societies with an increasing share of retirees, the elderly population forces the working age population to transfer a much higher share of their income to the elderly population than they themselves contributed during their working life. The conceptualization of transfers to the elderly population as a social contract implicitly assumes that future generations are of about the same size as current generations. The concept is therefore heavily criticized (e.g. Borchert, 2004; Schüller, 1995) and it is pointed out frequently that such a ”contract” is bound to break in ageing societies, where the size and share of the working age population

[1] On Wikipedia the following definition can be found: *An inter-generational contract is a dependency between different generations based on the assumption that future generations, in honoring the contract, will provide a service to a generation that has previously done the same service to an older generation. Source:* `https://en.wikipedia.org/wiki/Intergenerationality`. (Accessed on August 3, 2016).

declines strongly (e.g. Komp and Van Tilburg, 2010).

A Generational Contract between Individuals

Whenever relations between different generations are conceptualized as contract, they should include at least basic characteristics of a contract, namely a mutual exchange. *A contract is defined as agreement with specific terms between two or more persons or entities in which there is a promise to do something in return for a valuable benefit known as consideration.*[2] The consideration is something of objectively determined value given by both parties to a contract that induces them to enter into the agreement to exchange mutual performances.[3] An example of considerations in a generational contract, thus between individuals belonging to different generations, could be care and services provided to frail parents in return for bequests. In this case the care would be the consideration for the frail parents and the bequests the consideration for the children (example taken from Izuhara, 2004).

There is a range of papers that use the notion of a generational contract for the comprehensive system of reciprocal private transfers between individuals belonging to different generations. Whyte et al. (2008) define the intergenerational contract as implicit expectation that parents will care for their children until they can care for themselves, and children will support their parents when they can no longer support themselves. Their focus is on African countries, where intergenerational transfers are indeed a mutual exchange between individuals, as in these countries public transfers are not common. In the same volume, Roth (2008) analyzes the phenomenon of an *inverted generational contract* in a region in Burkina Faso, where, due to a lack of economic opportunities for the young, the parents support their adult children. She recognizes a further aspect by describing the generational contract as being based on ”the logic of debt”, with parents as the creditors of their children. The children pay off their debt with support for their parents in old age. Thereby she points out that, in the context of intergenerational transfers, the transfers associated with having children, bringing them up and educating them, constitute investments of the parents. The transfers and the support provided by the children to the elderly parents are the returns to these investments.

Laslett (1992) describes the concept of a generational contract between individuals belonging to different generations as *two-generational procreational contract*. Children are nurtured and procreated by parents; they feel obliged to support the

[2] Contract. (n.d.) Collins Dictionary of Law. (2006) Retrieved July 28 2016 from `http://legal-dictionary.thefreedictionary.com/contract`.

[3] Consideration. (n.d.) Collins Dictionary of Law. (2006). Retrieved July 28 2016 from `http://legal-dictionary.thefreedictionary.com/consideration`.

parents when they can no longer support themselves. However, Laslett criticizes the concept and argues that transfers from parents to children are made without expectation for return. Moreover, children do not care for their parents because of an implied agreement. However, these arguments are only correct in societies where the support of the elderly population is taken over by the public welfare system. In societies without public welfare system, there are strong institutions that enforce mutual obligations between generations. Göransson (2013), for example, analyzes the generational contract in Singapore, where the private transfers to the elderly are enforced by law if there is no voluntary agreement between family members. The concept of a generational contract as agreement between individuals belonging to successive generations fits well to countries with a small welfare state and an important role of the family in the transfer system.

A Contract between Generations

In European societies, the transfers that comprise the generational contract are split between the family and the state. The transfers to children are mostly privately organized, while the transfers to the elderly are predominantly public transfers. Gal et al. (2017) estimate that about 80 percent of net transfers to children are private transfers, while the net transfers to the elderly consist to 100 percent of public transfers. The concept of a generational contract as agreement between individuals belonging to different generations is therefore dissatisfactory, public transfers can hardly be interpreted as the result of an agreement between individuals. We therefore adapt the concept and think of intergenerational transfers as mutual exchange between two generations as a whole. The parental generation provides resources to children until they enter the labour force and maintain themselves. These transfers include the time and all other economic resources that parents provide to their own children, but also publicly provided education and health services which are financed by all taxpayers. Once the children enter the labour force, they pay part of their taxes and social contributions to finance pensions and health care for the elderly population. This concept of a generational contract highlights, in contrast to the interpretation as a social contract, that the transfers to children are an essential, indispensable part of the contract.

The description of intergenerational transfers as a contract between generations emphasizes the binding character of these reciprocal transfer flows. Although public old age provision does not require an individual to have children, it is nevertheless required for the generation as a whole. The level of old age benefits depends on the investments into the young generation and their ability to provide transfers. On the other hand, the transfers to the elderly are also well protected: once young people enter the labour force, they are bound to pay taxes and social contributions

on labour income. A large part of taxes and social contributions is used to finance the transfers to the elderly generation in form of pensions, health care and long-term-care. There is no way to opt out; the transfers to the elderly constitute a well-protected part of the public distributional system.

Our concept of a contract between two generations deviates from the definition of a contract in the legal sense, since it is not voluntary for the child generation to enter the contract. This enables the parental generation to extract an increasing share of the income of the young generation. As a result, it can become increasingly difficult for the young generation to finance transfers to the elderly population, to keep a decent living standard for themselves and invest into their own children at the same time. Data on social exclusion collected by EUROSTAT in the EU member states shows that such concerns are justified: in 20 out of 28 EU countries the risk of poverty and social exclusion was higher among the population aged 18-64 than the population aged 65+ in 2015.[4] Leach et al. (2016) document the increasingly difficult situation of the young population in their *European Intergenerational Fairness Index*.

The economic flows from parents to children and from the active population to the elderly are usually regarded as transfers. Transfers are defined as economic flows without a direct counterpart received in return.[5] When these intergenerational flows are interpreted as mutual exchange regulated in an intergenerational contract, the interpretation as transfers is not correct. The transfers to the younger generations can be regarded as saving/investment while the transfers to the elderly is the return to these investments. Accordingly, we use the terms *investment* or *human capital investment* for procreation and the bringing up of the young generation.

3 Data and Methodology: European National Transfer Accounts

There is a lot of research on public transfers and the redistribution of economic resources between age groups. Administrative data provide plenty of information on the level of public transfers as well as on the characteristics of the taxpayers and the beneficiaries. Such information is not available for most components of private transfers, such as the transfers from parents to their children. National Transfer Accounts (NTA) aim to close this gap and provide measures of public transfers, as well as estimates of private transfers among age groups. NTA measure how much labour- and asset income each age group generates, how this primary in-

[4] *Source:* EUROSTAT. People at risk of poverty or social exclusion by age and sex. Table ilc_peps_01.

[5] In the System of National Accounts a transfer is defined as follows: *A transfer is a transaction in which one institutional unit provides a good, service or asset to another unit without receiving from the latter any good, service or asset in return as counterpart.* Source: OECD Glossary of Statistical Terms, `https://stats.oecd.org/glossary/detail.asp?ID=2755` (Accessed: Sep 12, 2016).

come is transferred between age groups through public and private transfers, and how the disposable income is used for consumption and saving. NTA are built up as an accounting system that introduces information on the relation between age and economic activity into National Accounts. However, NTA record also the economic transfers between household members, of which the transfers from parents to children are the most important. The dataset contains the age-specific per capita averages of income, public transfer payments and public benefits, private transfer payments and benefits, consumption and saving. An overview of the methodology and results for countries around the world is provided in Lee and Mason (2011), a detailed description in UN (2013). NTA have been created so far only for single countries, since their creation requires a considerable amount of country-specific knowledge on institutions and data sources. In Europe, the availability of publicly available and harmonized data sources through EUROSTAT enabled the creation of gender-specific NTA for all EU countries except Malta, Croatia and the Netherlands. The European NTA dataset and the methodology is described in detail by Istenič et al. (2016).

The production boundary in National Accounts, and consequently in NTA, excludes most of the services which are produced by households for their own use (e.g. housework, childcare) or which are provided free of charge to other households. However, the importance of accounting for unpaid household work has been widely recognized. Information about household production is usually introduced into National Accounts through so called Household Satellite Accounts (Holloway et al., 2002; European Communities, 2003; Abraham and Mackie, 2005). Household Satellite Accounts extend the production boundary and provide information on the total value of services produced through unpaid household work. Accounting for unpaid household work is of particular importance in the context of the gender-specific European NTA. First, in all countries women devote much more time to unpaid household work and to childcare and less time to market work than men do. NTA data alone would deliver a highly distorted picture regarding age- and gender-specific production and transfer contributions. Second, the services produced through unpaid household work constitute important intergenerational transfers, in particular childcare and household maintenance.

Within the NTA framework, a method has been developed to generate household satellite accounts by age, to account for these important types of production and transfers (Donehower, 2013). The estimation of age-specific household satellite accounts is mainly based on time use data, which is the reason for calling them National Time Transfer Accounts (NTTA). NTTA measure mainly the age-specific production of services for the households' own consumption, such as cleaning work, the preparation of food and care. In addition, unpaid production activities for other

households are included, such as care for grandchildren. NTTA also include estimates of age-specific consumption of these services and of the corresponding transfers between age groups. Several attempts have been made to combine NTA and NTTA in Europe, and thereby providing comprehensive information on public and private transfers between age groups. Most of these attempts focus on one country. Kluge (2014) combined NTA and NTTA for Germany, Hammer (2014) for Austria, Zannella (2015) for Italy and Rentería et al. (2016) for Spain.

There have been efforts to harmonize time use surveys and make them comparable across countries. The two most notable of these efforts are the Harmonized European Time Use Survey (HETUS) and the Multinational Time Use Survey (MTUS). In the context of NTA, Hammer et al. (2015) used MTUS data to compare total production activities by age and gender in several countries. The results show that in some countries do more work than men do, but also that in most countries time devoted to production is similar for men and women. However, there are large cross-country differences in the distribution of paid and unpaid work across genders. Both data sources, HETUS and MTUS have been used by Vargha et al. (2017) to generate comparable NTTA. HETUS allows the construction of NTTA for 14 European countries for a single year. The MTUS data enabled the construction of NTTA for 6 countries at several time points.[6] Gal et al. (2017) combined these NTTA with national NTA data in 10 European countries to illustrate the full system of intergenerational transfers and the importance of transfers to children in form of services produced through unpaid work.

In this paper we combine European NTA (Istenič et al., 2016) with NTTA (Vargha et al., 2017) and NTTA based on Austrian time use data to provide a comprehensive picture of the system of intergenerational transfers for 17 countries.[7] The combination of NTA and NTA is not straightforward and requires certain assumption and approximations, which we have to keep in mind when we analyze the results. One shortcoming of our data is that the NTA and NTTA refer to different years. While NTA refer to the year 2010, the NTTA, and the time use surveys they are based on, are considerably older. Time use surveys are unfortunately collected only infrequently in most of the countries.[8] Another problematic issue is the valuation of time use for production in monetary terms. NTA are based on National Accounts and therefore measure in market prices. For household work, such market prices do not exist. The usual approach is to value unpaid work activities with wage rates that could be

[6] NTA and NTTA data can be downloaded from `www.wittgensteincentre.org/ntadata` (accessed 28 September 2017)

[7] Austrian NTTA is based on: Statistics Austria, Zeitverwendungserhebung 2008/09.

[8] The reference years of the time use surveys are the following: Austria 2008, Belgium 2005, Bulgaria 2002, Germany 2002, Denmark 2001, Estonia 2000, Spain 2003, Finland 2000, France 1999, Italy 2003, Lithuania 2003, Latvia 2003, Poland 2004, Sweden 2001, Slovenia 2001, United Kingdom 2005.

earned on the market for similar activities. Unfortunately, there is no data source that would allow a consistent estimation of the hourly wage rates for domestic staff across countries. We therefore use the average country-specific net wage to value the time spent on unpaid household work.

4 Intergenerational Transfers across Europe

An overview of the age-specific transfer net benefits by type for 17 European countries is provided in Figure 1. The public transfers are highlighted in black, the private market transfers in blue and the private non-market transfers in yellow. To make the transfer flows comparable across countries, we standardize the transfer data and measure the transfers as a share of the average labour income of a full-time worker (YLFT) in each country. The labour income of a full time worker is estimated using the measure of labour income as defined in NTA and data on working hours in the European Labour Force Survey. This standardization eliminates differences in the level of hourly labour income across countries, but accounts for differences in employment rates. Two countries with similar levels of productivity per working hour and similar tax rates would be different regarding the levels of transfers when measured in terms of YLFT, being higher in the country with the higher employment rates.

There are some general patterns of transfer flows between generations. Children and young adults are net receivers of transfers until their early twenties in all of the countries. The non-market transfers to children are clearly the most important transfer component at very young age, amounting to about one yearly labour income of a full time worker (YLFT) in the first years of life. Consequently, the values are higher in countries with large private non-market transfers, such as Poland, Bulgaria and Slovenia. While the private non-market transfer benefits decline strongly with the age of the children, private market transfers and public transfers are higher for older children and peak around the age of 16. At this age, the members of a cohort start entering the labour force and the average net transfer benefits decline. The working age population are clearly net providers of intergenerational transfers. The highest non-market transfers are provided at those ages when the own children are young, in most countries at age 30-35. While the non-market transfers decline with the age of the own children, the market-transfers increase and are highest at age 40-45. Total net contributions to intergenerational transfers corresponding to about 0.5 YLFT between age 30 and age 50. The population in old age are net receivers of intergenerational transfers, mostly of public transfers. The average yearly values correspond to 0.3 - 0.4 YLFT. In many countries there is a small flow of private non-market transfers from the elderly population to younger generations.

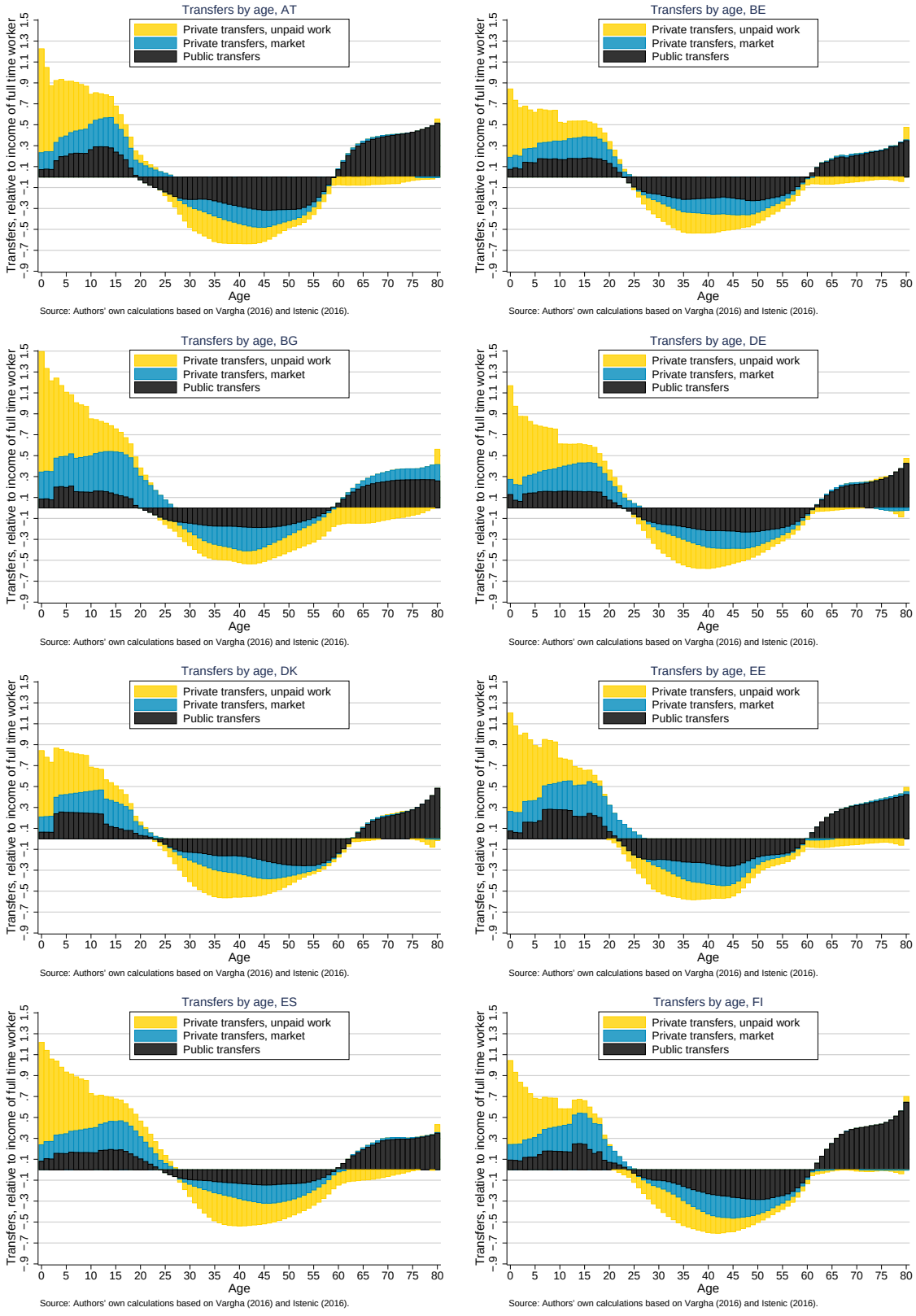

Figure 1: Transfers by Age and Sex

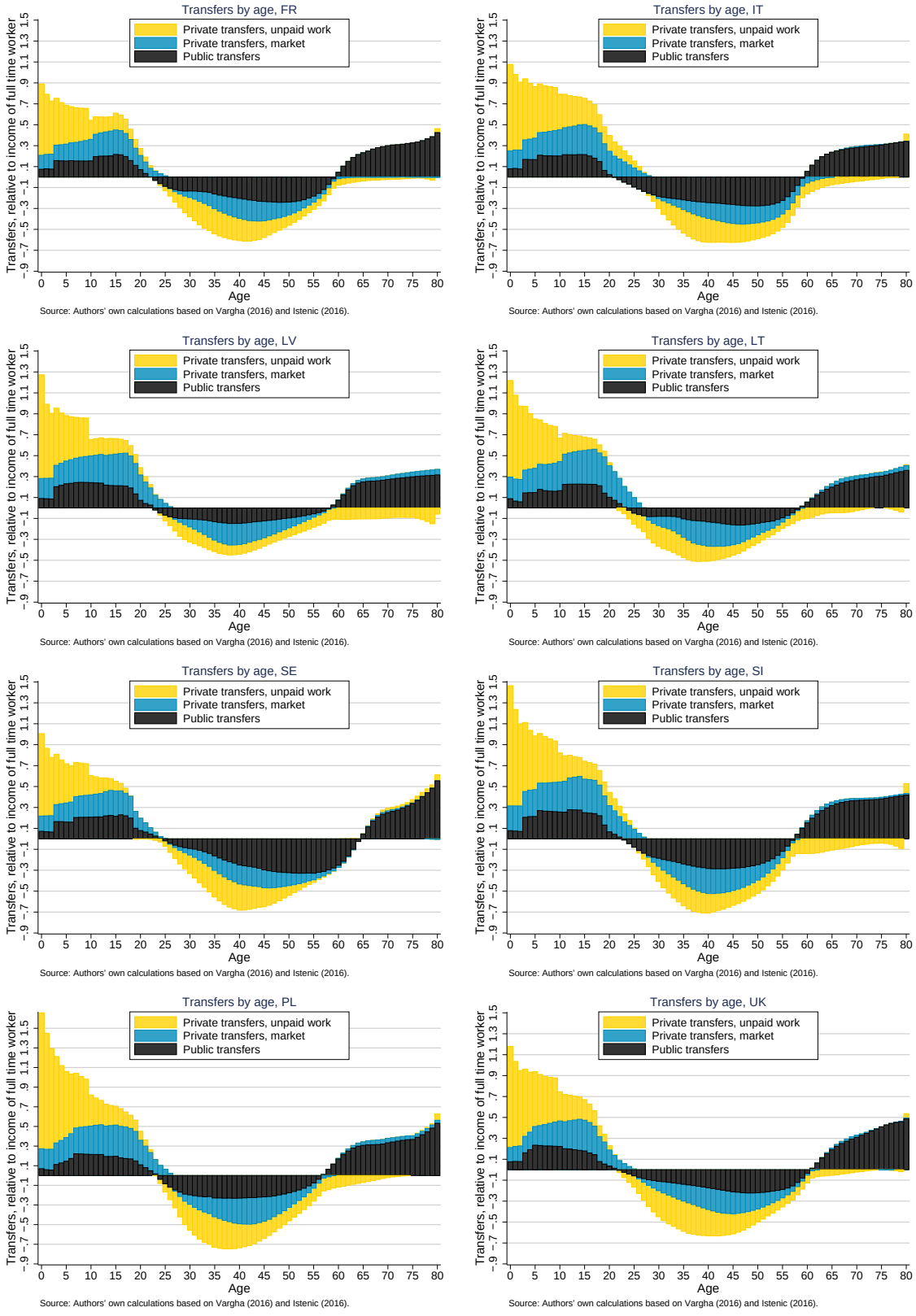

Figure 1 (continued): Transfers by Age and Sex

4.1 Total Transfers Between Generations

The total transfers between generations in an economy is not only determined by the age-specific values per capita, but also by the population structure. We derive a measure for the total net transfers between generations by multiplying the age-specific averages per capita with the corresponding population and adding up all age groups in childhood, working age and old age, respectively. We define childhood as those (young) ages at which the average person is a net beneficiary of transfers. Working age is defined as those ages with positive net contributions and old age is characterized by positive net benefits. Table 1 shows the values relative to the total labour income in the economy. The net contributions to non-market transfers have to equal the net benefits exactly, as there are no transfers across borders. There are some cross-border flows of private market transfers, so the sum over all life stages is not necessarily zero. Net public transfers do not add up to zero, as there are considerable cross-border flows. Furthermore, contributions can be used for interest payments or saving and the benefits can be financed out of dissaving or public asset income. In most countries part of the benefits are financed through dissaving.

Total transfers to children range from 35 percent in Germany to 57 percent in Lithuania. Total transfer payments of the working age population is high in the countries with large private non-market transfers, such as Italy and Poland, where the value of transfer payments of the working age population exceeds 60 percent of total labour income. These countries are also characterized by high transfers to children since non-market transfers constitutes clearly the largest component. The transfers to the elderly constitute mainly of public transfers and range between 11 percent of total labour income in Denmark to 20 percent in Finland.

4.2 Intergenerational Transfers by Type and Life Stage

In the previous chapter, we derived a measure for the total transfers between generations, which are strongly dependent on the age structure of the population. A central and important characteristics of an intergenerational transfer system are contributions and benefits on individual level. Total transfers received and paid by an individual depend on the age-specific level and the number of years a person is net beneficiary and net contributor. In this chapter, we derive measures for the transfers to a child and an elderly person by combining the per capita cross-sectional data on transfers with data on age-specific mortality. The measures are based on a thought experiment. We assume that the cross-sectional age pattern of transfers in the year 2010 corresponds to the transfer contributions and benefits of an individual over the lifetime. This individual faces an age-specific mortality corresponding to

Table 1: Aggregate Intergenerational Transfers as Share of Total Labour Income

	Young	Work	Old		Young	Work	Old
Austria	**0.36**	**-0.54**	**0.17**	**Belgium**	**0.43**	**-0.58**	**0.15**
Public	0.08	-0.28	0.19	Public	0.11	-0.26	0.14
Priv. market	0.11	-0.11	0.00	Priv. market	0.12	-0.14	0.01
Priv. non-market	0.17	-0.15	-0.02	Priv. non-market	0.19	-0.19	0.00
Age-border	21		61	Age-border	22		63
Bulgaria	**0.47**	**-0.50**	**0.15**	**Germany**	**0.35**	**-0.51**	**0.15**
Public	0.05	-0.17	0.13	Public	0.07	-0.22	0.15
Priv. market	0.19	-0.14	0.05	Priv. market	0.12	-0.13	0.00
Priv. non-market	0.22	-0.19	-0.03	Priv. non-market	0.16	-0.17	0.00
Age-border	23		63	Age-border	23		64
Denmark	**0.40**	**-0.51**	**0.11**	**Estonia**	**0.44**	**-0.50**	**0.15**
Public	0.10	-0.22	0.12	Public	0.10	-0.23	0.16
Priv. market	0.12	-0.12	0.00	Priv. market	0.15	-0.10	0.01
Priv. non-market	0.18	-0.17	-0.01	Priv. non-market	0.19	-0.17	-0.02
Age-border	22		65	Age-border	21		63
Spain	**0.49**	**-0.55**	**0.14**	**Finland**	**0.37**	**-0.50**	**0.20**
Public	0.09	-0.15	0.14	Public	0.09	-0.22	0.20
Priv. market	0.14	-0.15	0.01	Priv. market	0.13	-0.13	0.00
Priv. non-market	0.26	-0.26	-0.01	Priv. non-market	0.15	-0.15	0.00
Age-border	25		64	Age-border	22		63
France	**0.44**	**-0.54**	**0.16**	**Italy**	**0.47**	**-0.67**	**0.18**
Public	0.11	-0.22	0.17	Public	0.08	-0.29	0.19
Priv. market	0.14	-0.14	0.00	Priv. market	0.15	-0.16	0.00
Priv. non-market	0.19	-0.19	-0.01	Priv. non-market	0.23	-0.22	-0.01
Age-border	22		62	Age-border	24		63
Lithuania	**0.57**	**-0.51**	**0.18**	**Latvia**	**0.46**	**-0.39**	**0.12**
Public	0.13	-0.16	0.17	Public	0.11	-0.12	0.16
Priv. market	0.24	-0.17	0.02	Priv. market	0.17	-0.13	0.02
Priv. non-market	0.20	-0.19	-0.02	Priv. non-market	0.18	-0.13	-0.06
Age-border	23		62	Age-border	23		62
Poland	**0.53**	**-0.61**	**0.17**	**Sweden**	**0.36**	**-0.53**	**0.16**
Public	0.09	-0.20	0.16	Public	0.10	-0.26	0.14
Priv. market	0.18	-0.16	0.02	Priv. market	0.11	-0.12	0.00
Priv. non-market	0.26	-0.25	-0.01	Priv. non-market	0.14	-0.16	0.01
Age-border	23		61	Age-border	22		66
Slovenia	**0.42**	**-0.53**	**0.15**	**UK**	**0.47**	**-0.56**	**0.15**
Public	0.09	-0.22	0.16	Public	0.10	-0.18	0.15
Priv. market	0.15	-0.15	0.01	Priv. market	0.14	-0.15	0.00
Priv. non-market	0.18	-0.16	-0.03	Priv. non-market	0.23	-0.22	-0.01
Age-border	24		61	Age-border	21		64

the age-specific rates observed in 2010.[9] We then calculate the amount of transfers that our hypothetical cross-section individual receives in childhood, the amount it transfers to children and elderly during working life and the amount that it receives in old age. We want to emphasize that our analysis does not tell anything about the transfers of a certain individual or member of a certain cohort. This would require longitudinal data for a long time-period, covering the whole life course of a generation. Our measures are designed to provide information on important dimensions of intergenerational transfer systems in a given year.

Total net transfers received in childhood T_{young} is calculated as the sum of expected transfers per capita at all young ages with positive net transfer benefits (Equation 1). The term TG_i represents the public transfer net benefits at age i, the term *TF*$_i$ the private market transfers and the term *TFHH*$_i$ the private non-market transfers. The age groups included range from zero to l, with l referring to the oldest age group in young age with positive net transfer benefits. We refer to this measure as *expected* transfers, because we adjust the age-specific NTA per capita values with survival expectancy. The measure of transfers paid during working age T_{work} is calculated as the sum of net transfer contributions over all age groups from $l+1$ to $u-1$, with u referring to the youngest age group in old age with positive net contributions (Equation 2). The total transfers in old age T_{old} are calculated as sum over all age groups from u up to 100. Since transfer data in NTA is only available until age 80+, for all older age groups we use the age-specific value at age 80. The S_i stand for the survival probability until age i, calculated from cross-sectional mortality data. For $i = 100$ the S_i represent the life expectancy at age 100, given the mortality rates of 2010.

$$T_{young} = \sum_{i=0}^{l} (TG_i + TF_i + TFHH_i) * S_i \tag{1}$$

$$T_{work} = \sum_{i=l+1}^{u-1} (TG_i + TF_i + TFHH_i) * S_i \tag{2}$$

$$T_{old} = \sum_{i=u}^{100} (TG_i + TF_i + TFHH_i) * S_i \tag{3}$$

The results are shown in Table 2, reporting the value of expected transfers relative to YLFT by type and life stage for each country. There are considerable differences across countries in the level of transfers. The total transfers a child can expect until becoming net contributor to the transfer system range between 12.6 YLFT in Belgium and more than 19 YLFT in Poland, Slovenia and Bulgaria. The differences

[9] *Source:* EUROSTAT, population and number of deaths by age in 2010.

across countries are mainly influenced by the amount of the private non-market transfers. The non-market transfers to children amount to less than 6 YLFT in Belgium and more than 10 YLFT in Poland. The value of public transfer benefits in childhood range from less than 3 YLFT in Germany to 4.3 YLFT in Slovenia. And the private market transfers range from less than 4 YLFT in Belgium to more than 7 YLFT in Bulgaria.

The expected net contributions to the intergenerational transfer system in working age amount to slightly more than 10 YLFT in Latvia and to almost 17 YLFT in Poland and Sweden. The types of transfers are different across countries. The values of private non-market transfer contributions range between slightly more than 3 YLFT in Latvia to more than 6 YLFT in Spain, Poland and the UK. There are also huge differences in the public transfer contributions during working age across countries: they amount to slightly more than 3 YLFT in Latvia and Lithuania and more than 8 YLFT in Sweden and Austria. The value of private market transfers in working age range between 3 and 4 YLFT in the majority of countries. They are slightly higher in the UK, Slovenia and Poland.

The value of public transfers in old age reflects the value of contributions. It ranges from slightly more than 3 YLFT in Bulgaria to more than 7 YLFT in Austria and Slovenia. There are only minor private net transfers to and from the elderly population in form of private market transfers. However, in all of the countries the elderly population are net contributors in form of private non-market transfers. Hover, only in Latvia the values exceed one YLFT. These transfers reflect mostly the involvement of the elderly population in taking care for their grandchildren.

Obviously, the value of total average net transfers paid during working age is considerably lower than the transfers received in childhood and old age. This pattern reflects the large share of the working age population in most of the countries. Almost all analyzed countries experienced a baby boom or at least periods with higher fertility between the second world war and the 1980s. In 2010 these larger cohorts were in working age and provided transfers for a comparably low number of children and a comparably low number of elderly persons. For the population in total, the private transfer benefits equal total private transfer contributions in a given year. However, the per capita values of the transfers received by the comparable few persons in childhood and old age are high relative to the contributions of the numerous working age population.

Table 2: Intergenerational Transfers by Life Stage and Type

	Young	Work	Old		Young	Work	Old
AT	**16.1**	**-16.3**	**7.4**	**BE**	**12.6**	**-13.9**	**4.6**
Public	3.6	-8.4	8.0	Public	3.3	-6.2	4.5
Priv. market	4.6	-3.2	0.1	Priv. market	3.6	-3.3	0.2
Priv. non-market	7.9	-4.7	-0.7	Priv. non-market	5.6	-4.5	-0.1
Age borders	22		60	Age borders	23		62
BG	**19.7**	**-13.2**	**3.6**	**DE**	**15.4**	**-14.5**	**4.9**
Public	2.5	-4.7	3.2	Public	2.9	-6.2	4.9
Priv. market	7.7	-3.7	1.3	Priv. market	4.9	-3.4	-0.1
Priv. non-market	9.5	-4.8	-0.9	Priv. non-market	7.5	-4.9	0.1
Age borders	24		62	Age borders	24		62
DK	**13.5**	**-15.0**	**4.5**	**EE**	**16.9**	**-14.4**	**4.6**
Public	3.4	-6.4	4.6	Public	4.0	-6.6	5.0
Priv. market	4.1	-3.5	0.1	Priv. market	5.6	-3.0	0.2
Priv. non-market	6.0	-5.1	-0.2	Priv. non-market	7.3	-4.9	-0.5
Age borders	22		63	Age borders	22		62
ES	**18.2**	**-13.1**	**5.4**	**FI**	**13.9**	**-15.4**	**8.0**
Public	3.3	-3.5	5.5	Public	3.4	-6.6	7.9
Priv. market	5.3	-3.5	0.2	Priv. market	4.9	-4.0	-0.1
Priv. non-market	9.6	-6.1	-0.3	Priv. non-market	5.7	-4.8	0.1
Age borders	26		63	Age borders	23		62
FR	**13.2**	**-14.7**	**6.3**	**IT**	**17.6**	**-15.9**	**5.6**
Public	3.2	-5.9	6.6	Public	3.2	-7.0	5.8
Priv. market	4.1	-3.7	0.0	Priv. market	5.7	-3.7	0.0
Priv. non-market	5.8	-5.1	-0.2	Priv. non-market	8.8	-5.3	-0.3
Age borders	23		61	Age borders	25		62
LT	**17.0**	**-11.5**	**3.9**	**LV**	**16.7**	**-10.0**	**2.9**
Public	3.6	-3.4	3.8	Public	4.0	-3.2	3.8
Priv. market	6.6	-3.7	0.5	Priv. market	5.8	-3.4	0.5
Priv. non-market	6.8	-4.3	-0.4	Priv. non-market	6.8	-3.4	-1.4
Age borders	24		61	Age borders	23		61
PL	**20.0**	**-16.8**	**6.5**	**SE**	**13.4**	**-17.1**	**6.7**
Public	3.5	-5.5	6.3	Public	3.7	-8.4	6.1
Priv. market	6.3	-4.7	0.6	Priv. market	4.2	-3.7	0.1
Priv. non-market	10.2	-6.6	-0.4	Priv. non-market	5.5	-5.1	0.6
Age borders	23		60	Age borders	23		64
SI	**19.6**	**-15.9**	**6.4**	**UK**	**16.1**	**-16.5**	**6.5**
Public	4.3	-6.6	6.9	Public	3.4	-5.4	6.5
Priv. market	6.6	-4.4	0.4	Priv. market	4.8	-4.4	0.2
Priv. non-market	8.7	-4.8	-0.9	Priv. non-market	8.0	-6.7	-0.1
Age borders	25		60	Age borders	22		63

5 A Measure of Generational (Im-)Balance

We use the data on age-specific transfers to evaluate the compatibility of the 2010 age patterns of transfers with the generational contract. Are the investments in the young generations large enough to finance the transfers to the parental generation when they enter retirement? For this purpose, we generate two sub-indicators, based on the data from the previous chapter. The first sub-indicator measures the number of children that can be supported and raised with the transfers that are provided to the child generation during working age. The second sub-indicator measures the number of net contributors to the transfer system that are required to finance the total amount of transfers to a person in old age. Our focus is on the difference between these two measures. It can be interpreted as the number of additional children and net contributors that are required to finance the transfers to the elderly in the future, given the age-specific transfer levels and mortality rates from 2010.

We again assume that the cross-sectional age pattern corresponds to the life course pattern of transfers of a hypothetical individual. For the first sub-indicator, the number of supported children, we assume that the net transfer benefits received in childhood measure the transfers that are required by a child to grow up and becoming a net contributor to the transfer system. The number of supported children is calculated by relating the total transfers to children that are provided during working age, to the total amount of transfers that is required in childhood.[10] The results are shown in the first column of Table 3. The values range from 0.5 in Latvia to 0.88 in Sweden. Since the age-specific transfer data reflects the transfer pattern from 2010 and net contributions and benefits have to add up for private transfers, this sub-indicator is basically a measure of fertility expressed in terms of transfers. If, for example, the number of supported children per person were 0.7, this would correspond to a fertility rate of about 1.4, since support for children comes from father as well as from the mother.

The second sub-indicator measures the number of working age contributors that are required to finance the transfers to the elderly. This indicator is calculated as the ratio of transfers expected in old age and the transfers that are provided to the elderly population during working age. The values are reported in the second column of Table 3 and range from 1.11 in Bulgaria to 2.53 in Spain. The low values for

[10] The net transfer outflows in working age are split in a part transferred to children and a part transferred to the elderly, according to the share of total net transfers to children and total net transfers to the elderly population by type of transfer. Private transfer go almost exclusively to children while public transfers are mainly transfers to the elderly population. Additionally, we assume that the net contributions of private transfers of the population in old age are directed to the young generation, thereby reducing the costs of children for the working age population.

Bulgaria reflect the low level of public transfers and the comparably low life expectancy. The high values for Spain can be explained with the low tax rates on labour, the high unemployment rates and a large dissaving of the public sector in 2010. Public dissaving enables the financing of public old age benefits without immediate increase of the contributions. The value of about 1.2 in Italy, for example, means that over the whole working life 1.2 net contributors provides the total transfers that are expected by a person in old age. The system would be balanced if fertility is about 2.4 children per women and the number of supported children is 1.2.

The difference between the two sub-indicators is our measure of interest (third column in Table 3). It measures the number of additional in children per person that would be required to enable them financing the transfers to the elderly without increasing the contribution rate or reducing the benefits. The values range from 0.37 in Sweden to 1.93 in Spain. The value of 0.25 means that it would require an increase in fertility of 0.5 children per women to have enough contributors financing the transfers to the elderly population. We have to conclude that in all of the analyzed countries the intergenerational transfer system is considerably out of balance.

The importance of private transfers is also the focus in Gal et al. (2017). In a similar way as this paper, they combine NTA and NTTA results to get a comprehensive picture of intergenerational transfers. Observing the larger amount of transfers provided to children, they conclude that we live in a *child-orientated continent*. However, if more resources are transferred to children or to the elderly population is not a meaningful question. Obviously, a child requires a much higher level of transfers than an average person in old age. Individuals loose some of their physical strength in old age and some individuals lose their cognitive abilities. However, all children have to acquire the physical strength and the cognitive abilities in the first place through a lengthy learning process. During this process, they rely on transfers from their parents and public transfers. A sustainable transfers system has to reflect the larger amount resources and transfers that are required by the children. Our indicator shows, that despite the much larger value of transfers to children, these investments are still too low to enable the child generation financing the old age transfers to the parental generation.

Our indicator is based on cross-sectional data and summarizes information on the design of transfer systems in a given year. What these results can say for the future is that it requires considerable adjustments in the age-specific patterns of intergenerational transfers. The concept of a generational contract does not describe an agreement but a fundamental relationship. The rather generous transfers to the elderly population observed in 2010 will have to adjust to the lower investments in children of the population that enters retirement in the coming decades. There is a

tendency to higher labour force participation in old age, which would increase total contributions. However, we also benefit from longevity, which increases the total transfer benefits in old age. By calculating a similar indicator Hammer et al. (2016), taking longevity and the change in employment rates into account, shows that the broad picture of unsustainable transfers to the elderly will not change much by accounting for changes in labour force participation rates and increasing retirement ages.

Table 3: The Generational Balance of Transfers

Country	No. of supported children per contributor in working age	Required contributors per elderly beneficiary	Balance indicator
AT	0.67	1.37	0.70
BE	0.82	1.31	0.49
BG	0.49	1.11	0.63
DE	0.66	1.16	0.50
DK	0.86	1.35	0.48
EE	0.63	1.24	0.61
ES	0.61	2.53	1.93
FI	0.78	1.77	0.98
FR	0.86	1.80	0.94
IT	0.64	1.21	0.57
LT	0.55	1.89	1.34
LV	0.50	1.86	1.36
NL	0.81	1.98	1.17
PL	0.66	1.78	1.12
SE	0.88	1.25	0.37
SI	0.60	1.60	1.00
UK	0.82	1.92	1.10

6 Conclusion

The economic exchange between generations is at the very heart of societies and their most important institutions, including the family and the public welfare system. The family provides most of the transfers to children, with services provided by parents through unpaid work as most important part. If the unpaid work is valued with the average net wage in the specific country, the value of total transfers to a child amounts to between 12 and 20 times the yearly labour income of a full-time worker. The net transfers to the elderly are mostly public transfers, amounting to 4-8 times the yearly labour income of a fulltime worker.

Despite their size and importance, private transfers to children are hardly visible in official statistics. This is a highly unfortunate situation. Obviously, children are a very costly investment and it requires appropriate institutions that enable and support families to provide these transfers. Possibly, also as consequence of their low visibility, policy makers as well as the wide public are not fully aware that the transfers to children create and maintain the contribution base for the public

transfer system in the long run. The concept a generational contract describes this fundamental relationship: during working age a generation has to make sufficient investment in the child generation to enable them to finance the public transfers to the elderly once the child generation enters employment.

We use age-specific data on transfer contributions and benefits provided in NTA and NTTA to calculate an indicator that measures if the age pattern of public transfers observed in 2010 is in line with the intergenerational contract, i.e. if the transfers to children are large enough to enable them financing the transfers to the elderly population when they enter working age. In the analyzed countries, the transfers to children provided by one person during working age can support about 0.7 children, on average. This reflects the fertility rate, which is considerably below 2 in most of the European countries. However, to finance the total transfers a person in old age it requires almost 1.6 contributors, on average. Such a situation can only be maintained because most European countries experienced a baby boom in some years between the second world war and the 1980s. The generation that is currently in retirement, the parents of the baby boomers, invested considerably more in the young generation than the current working age population. It will therefore require a strong adjustment of the intergenerational transfer systems.

Accounting for private transfers in the organization of intergenerational public transfers is not only a question of maintaining the system. Raising children is associated with considerable personal costs in terms of leisure, income and consumption. It is therefore not only a question of sustainability, but also of fairness, to treat generations differently, depending on their investment in children. By ignoring the private transfers to children, the public intergenerational transfer system redistributes to generations that contribute little to the intergenational transfer system and puts a large burden on the young generations. Nevertheless, this violation of the generational contract will force the public sector to break the promises on the level of old age benefits in the long run.

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