Courant Research Centre

'Poverty, Equity and Growth in Developing and Transition Countries: Statistical Methods and Empirical Analysis'

Georg-August-Universität Göttingen
(founded in 1737)

Discussion Papers

No. 212

Pension programs around the world:

Determinants of social pension

Alexandra Rudolph

August 2016

Platz der Göttinger Sieben 5 · 37073 Goettingen · Germany
Phone: +49-(0)551-3921660 · Fax: +49-(0)551-3914059

Email: crc-peg@uni-goettingen.de Web: http://www.uni-goettingen.de/crc-peg

Pension programs around the world: Determinants of social pension

Alexandra Rudolph*

August 2016

Abstract

Old-age poverty is to become one of the most pressing issues in the coming decades given the demographic trends forecasted. Particularly in developing countries this could be an obstacle to inclusive and sustainable growth as well as the fight against all forms of poverty (SDG 1), through shocks on consumption and production patterns within countries. Investigating social, non-contributory pension systems highlights their potential for countries to implement one of the main instrument to fight old-age poverty. A new comprehensive global data set of 185 countries over the 1960-2012 period on the provision of social pension across the world allows the author to examine trends in social pension provision in the last five decades and study internal and external political economy drivers of implementation. Grouped event history data allows the control of duration dependence on the probability of social pension adoption in the multivariate setting. Results show that internal (national) demand drivers are more important than external (international) peer pressure while the composition of the political system and of governments seem to be major factors influencing the provision of social pension mainly in developing countries. Since only 50 percent of countries provide against old-age poverty countries may use the window-of-opportunity of the 2030 Agenda to reach "nationally appropriate social protection systems" (SDG 1.3; UN, 2015).

Keywords: *public pension*, *social pension*, *demographic change*, *old-age poverty*, *political economy*, *panel data*

JEL Classification: *H55*, *J14*, *I38*

Acknowledgements: I would like to thank Jan Priebe, Isis Gaddis, Stephan Klasen, Axel Dreher, Vera Eichenauer, Sarah Langlotz, and Markus Loewe (DIE) for insightful discussions and feedback. I also like to thank the participant at the International Politics and Development Economics chair workshop, at the European Public Choice Society Meeting in Groningen (2015), at the Poverty Reduction, Equity and Growth Network (PEGNET) and at the annual Meeting of the Verein für Social Politic (VfS) for valuable input and comments.

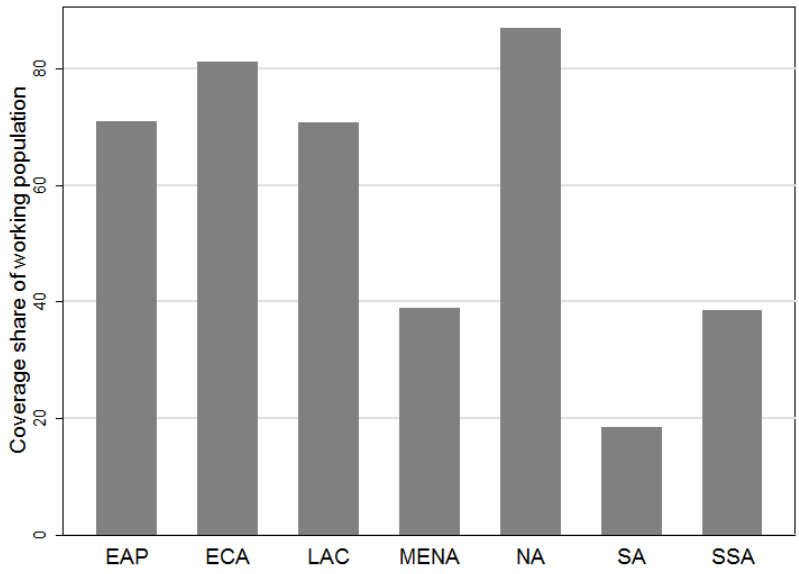
---

* Contact:
Alexandra Rudolph, German Development Institut / Deutsches Institut für Entwicklungspolitik (DIE), Tulpenfeld 6, 53113 Bonn, Germany; Email: alexandra.rudolph@die-gdi.de; Telefon: +49 (0)228 94927 158

I. Introduction

Population growth, decreasing fertility rates and improvements in life expectancy in many countries around the world have contributed to a substantial rise in the world's elderly population. In line with this general trend, the total size of the global population above 60 years is expected to increase further and reach 2 billion by 2050 in absolute terms (UN, 2014). Given the past and expected future increase in the elderly population, many countries in the world have introduced reforms to their pension systems with the double goal of mitigating old-age poverty and ensuring the financial viability of the system. Despite reforms, until today the majority of elderly people in the world, especially in developing countries, are either not at all or only insufficiently covered by a pension scheme (ILO, 2014).[1] Figure 1 displays these trends and shows that with exception of North America (NA) and Europe and Central Asia (ECA) individual coverage rates are below 80 percent of the working population or even below 20 percent in South Asia.

Figure 1: Coverage of pension programs



Notes: ILO (2014). East Asia and the Pacific (EAP), Europe and Central Asia (ECA), Latin America and the Caribbean (LAC), Middle East and Northern Africa (MENA), North America (NA), South Asia (SA), and Sub-Saharan Africa (SSA).

These low coverage rates and frequently insufficient pension benefits in developing countries have been attributed by many scholars and pension experts to the specific nature of con-

[1] For an overview and discussion on causes and measurement of old-age poverty especially in developing countries see Barrientos et al. (2003).

tributory retirement schemes (Willmore, 2007; Holzmann, 2012). Contribution-based pension systems, which link pension eligibility and benefits to previous contributions or work history, fail to achieve the desired outcomes in several cases. This is particularly relevant in developing countries in which workers who participate in contribution-based pension schemes are usually from the upper half of the wealth distribution. They are predominantly from urban areas with a secure career within the public sector while large parts of the population are left without effective pension coverage (Palacios & Sluchynsky, 2006; Willmore, 2007). The reliance on contributory pension systems alone has therefore been seriously questioned. As a consequence, several countries have introduced a complement in their pension systems called 'social pensions' (non-contributory funds), which provide cash transfers for the elderly with little or no link to previous contribution or work history.[2] In the context of the larger debate over pension reform, some argue that these social pensions are an effective way to deal with the limited coverage of contributory schemes and help alleviate poverty among the elderly (Willmore, 2007; World Bank, 2009; ILO, 2014; UNDP, 2014). This question is particularly relevant to achieve "nationally appropriate social protection systems" as demanded by the 2030 Agenda in its sustainable development goals (SDG 1.3) to alleviate all forms of poverty everywhere.

We address the question what drives the implementation of social pension systems in more detail. Surprisingly, despite the growing interest in and importance of non-contributory pensions around the world, little is known about the number of countries that have adopted such a pension scheme, the related geographical distribution across countries, and trends over time. In fact, the academic and policy literature in these fields have been entirely based on OECD countries (Gruber and Wise, 1997, 2002, 2005; Gruber et al., 2009; OECD, 2013; Wolf et al., 2014) or focused on individual country case studies only (Holzmann and Hinz, 2005; Willmore, 2007; Whitehouse et al., 2009; World Bank, 2009; Chomik and Whitehouse, 2010; Pallares-Miralles et al., 2012; Kaushal, 2014). While these are important contributions, the existing studies fail to provide a comprehensive overview of non-contributory pensions' distribution across a larger number or more heterogeneous countries and in the developing world. Moreover, no single analysis investigates to what extent the

[2] The terms social pension and non-contributory pension are used interchangeably throughout the paper.

provision of this pension form is driven by different economic, demographic, political and international factors.

This article's principle objective is twofold: first, we illustrate the trends of the development of non-contributory pension systems over time, and second, we provide a systematic analysis of the cross-country determinants of the introduction of social pensions. By generating a new data set on social pension adoption using information from the World Social Protection Report of the International Labor Organization (ILO, 2014) we compare alternative data sources and social pension classifications. This data allows us to cover up to 185 countries over the 1960-2012 period. Thus we are the first to look at an extensive sample including developed and developing countries. Thereby, based on the political economy of social security spending and public good provision, we investigate the influence of economic and demographic country composition. Subsequently, we specifically focus on the influence of political institutions and international forces in the adoption of non-contributory pensions.

Our results suggest that demographic factors are decisive for the adoption of social pension proxying for the demand of increased old-age public support. Whereas, democratic countries are more likely to adopt social pension, more fractionalized governments have a lower probability of introduction. This correlation may reflect that weaker governments are less likely to implement non-contributory old-age anti-poverty transfers. The influence of miscellaneous international leverage factors highlights that trade openness affects the launch of a social pension negatively while aid dependency of a country is not systematically related. These findings suggest that international business relations, although seen as a sign of trust in the institutional structure of the countries, do not spill over to social security provision in the form of social pensions.

The remainder of the paper is structured as follows. In section 2 we introduce our data on social pensions, provide a consistent classification and describe the international distribution and trends in the last decade for an extensive sample of countries. In section 3 we review the political economy literature and discuss theoretical predictions and empirical findings regarding the provision of social security and transfer programs. Testable hypotheses are developed thereafter. We outline the empirical strategy and discuss the results in section 4. Section 5 concludes.

II. Social pension around the world

The diversity in design and shaping of pension programs in general and social non-contributory pensions in particular make a comparison across countries rather complex. We use information from the World Social Protection Report (ILO, 2014), which provides details on contributory and non-contributory pensions legal implementation across countries and over time.[3] We use a comprehensive classification and construct a data set which allows us to describe worldwide trends and distribution over time in the provision of social pension.

2.1 Classification of social pension

The study focuses on social pensions or non-contributory pension systems with the primary goal to ensure against old-age poverty. The most comprehensive classification is provided by the World Bank's multi-pillar approach implemented in early 2000 (Holzman and Hinz, 2005).[4] Therein a new pillar, Pillar 0, was introduced and defined as "a non-contributory pillar (in the form of a demogrant[5] or social pension) that provides a minimal level of protection" (ibid.: 1). Social pensions are commonly financed from general government revenue and are distributed to the elderly on a targeted (means-tested, ear-marked) or universal basis.[6]

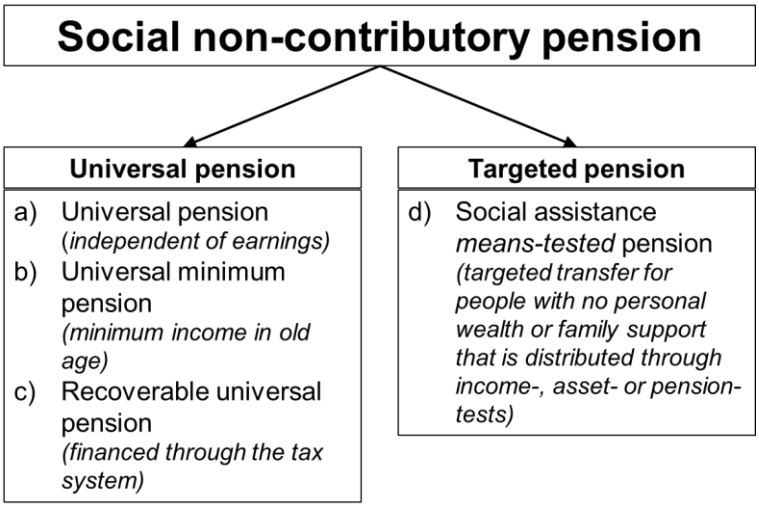
[3] The International Social Security Association together with the Social Security Administration also gather data on mandatory pension programs around the world. For the last decade they provide surveys on 'Social Security Programs Throughout the World' (SSPTW). This data has two disadvantages: first, it is based on survey questions, which are prone to selection bias and have the potential for inconsistencies in replies. Second, it only covers a time frame of the last twelve years from 2001-2014 which leaves out important developments of non-contributory pension provision of earlier decades. By using the information provided by the ILO we are able to cover a larger time frame and information on a larger set of countries. Other initiatives by HelpAge International, the World Bank (WB) and other institutions such as the UN population division and the European Commission assess the extent, coverage and distribution of retirement programs globally. Although important in itself to collect as much data as possible to be able to establish best practice models, most of the information available from these sources is rather fragmented in its scope of countries or availability of information over time. For an overview see HelpAge International (2014).

[4] Diversity in pension system specifically and social security programs in general, with the goal to fight old-age poverty, made a pointed approach towards pensions necessary. The World Bank therefore expanded the three-pillar system to a five-pillar one (Holzmann and Hinz, 2005). The three pillar classification was introduced in 1994 (World Bank, 1994). Pillar 1 referred to a basic pension which representd an anti-poverty pillar that guarantees a minimum income at old-age irrespective of a person's earning history. Pillar 2 included a system of mandatory contributions to an earnings-related scheme while Pillar 3 refered to a voluntary savings system available to anyone who wishes to supplement his/her retirement income by the first two pillars.

[5] Demogrant funds are universal flat rate funds based on other characteristics than contributions, i.e., age.

[6] The original Pillar 2 was split into a new Pillar 1 (public earnings-related pension) and a new Pillar 2 (private earnings-related pension), with Pillar 3 refering to voluntary contributions to occupational or private pension plans and Pillar 4 including a variety of non-pension retirement savings. See Willmore (2007) for a more detailed discussion on the respective pension pillars.

Figure 2: Social pension classification



Notes: SSPTW, various issues; ILO (2014).
a)-d) social pension components by Willmore (2012),
a) and d) Universal and targeted (means-tested) pension identified by ILO (2014).

Figure 2 shows different aspects of social pension components (a)-(d) based on the detailed classification of Willmore (2012). He classifies four different systems to be part of social pension programs which are grouped in universal and targeted social pension. First, universal non-contributory pensions include (a) universal pensions, (b) universal minimum pensions, and (c) recoverable social pensions. And second, targeted social pensions include (d) means-tested social assistance pensions where means-tested include income-, asset- or pension-tested in order to be eligible to receive a pension.[7]

The advantage of this classification is that it includes all kinds of basic transfers to the elderly including flat-rate components and minimum provision of old-age income. These may also be part of mandatory individual accounts or other pay-as-you-go pension systems and may not necessarily be part of a non-contributory social pension.[8] The advantage of this classification is allowing for the diversity of programs, but it also bears the risk that the defi-

[7] In detail, universal (minimum) pensions are provided to all residents or citizens independent of earnings, assets, family transfers or other forms of pension income. The funds are provided by the government and are transferred to all elderly residents independent of income. E.g., in Bolivia "Renta Dignita" is financed by the government through taxes on hydro-carbons and dividends from public enterprises. Recoverable social pensions are universally distributed dependent on years of service or residency, financed through the tax system (payroll taxes) and thus recoverable by tax authorities. Lastly, targeted (means-tested) social pensions are social assistance pensions that require applicants to pass a means-test guaranteeing a non-contributory pension for poor people with no personal wealth or family support.

[8] Pay-as-you-go (PAYG) pension systems are publicly managed pension systems promising the contributors future goods and services form the government by compulsory (earmarked) income taxes and are usually part of the new Pillar 1 (Willmore, 2007).

nition includes very broad categories and may not be regarded as `social´ pension consistently. A narrow definition of social pension solely includes universal and means-tested pensions which refers to (a) and (d) in Figure 2. The advantage of this classification is that it specifically includes non-contributory components as a complement to other forms of pension programs and is consistent with the classification of the World Banks' `zero pillar'.

2.2 Non-contributory pension data

The detailed classification allows us to construct indicators of whether countries have an earnings-related and/or social pension and which component of a social pension (universal or targeted) is implemented in the country.

The empirical analysis is based on data from the World Social Protection Report (WSPR) issued by the International Labor Organization on main social security programs and non-contributory pension schemes (ILO, 2014).[9] This allows us to address an extended time frame with information on contributory and non-contributory pensions worldwide over the 1960-2013 period. The ILO provides an overview of pension programs including the type of program, the date of the first law, the name of the non-contributory scheme, the year it was introduced, and legal requirement characteristic. The constraints of information provided is that we do not have detailed information on components of contributory pension systems and therefore only use information compatible to the narrow definition of social pension (Figure 2: a) + d)). The final data set provides information on 185 countries including information that dates back until 1891 where a non-contributory pension scheme was implemented in New Zealand.[10] We start our observation period in 1960, because most information on relevant variables is not available before and even then information is fragmented.

In the following, we describe the main distributional facts and trends in social pension provision since 1960. Note that since the distribution and trends show the existence of pension programs, first, they hide the fact that availability of pension per se says nothing about the coverage of the population. Second, there is no information on whether or not the level of the pension secures an adequate living standard for those covered.

[9] See Annex IV: Statistical tables, tables B6 and B7 (ILO, 2014).

[10] Other countries are reported before 1960, for instance, Denmark (1891) implementing a national universal pension, Australia (1900) providing a targeted `age pension' or United Kingdom (1909) adopting pension credits that are targeted non-contributory pensions.

2.3 Facts and figures

The advantage on focusing on the WSPR data is threefold: first, the comparability across countries is to a larger extent guaranteed. Second, we are able to solely focus on social pension programs that specifically target old age poverty reduction.[11] Third, we analyse a large set of countries and look at characteristics of implementation over a time frame of five decades, because the WSPR provides information on the year of the law implementing non-contributory (and contributory) pensions for each country.

The data set provides information on contributory and social pension (top panel, Table 1). The share of contributory pension worldwide increased from 45 percent in 1960 to 82 percent in 2012 (96 and 176 countries, respectively). The share of social non-contributory pensions also increased in the same timeframe from 17 percent (37 countries) to 45 percent (96 countries) worldwide. Splitting social pensions into its universal and targeted pension we observe that most countries use targeted pensions. The share of universal pension doubled from four percent in 1960 and in 1980 (eight and nine countries, respectively) to eight percent and 17 countries in 2012. Targeted pensions that focus payment on specific attributes of the recipient are much more common already in 1960. 29 countries mainly in Europe and Central Asia already have a targeted pension in 1960. This share of 14 percent increased to 28 percent of countries in 2000 and 37 percent in 2012.

[11] Critiques may argue that other components of pension systems are also used to prevent old age poverty; however, the aim of our analysis is to focus on the zero pillar (non-contributory) pensions, which are targeted individuals that have never contributed to any pension system.

Table 1: Social pension by region (1960-2012)

	Contributory pension								Social pension								
Region	1960		1980		2000		2012		1960		1980		2000		2012		N
East Asia & Pacific	8	22%	19	53%	24	67%	25	69%	4	11%	10	28%	10	28%	14	39%	36
Europe & Central Asia	46	81%	47	82%	49	86%	49	86%	20	35%	34	60%	34	60%	38	67%	57
Latin America & Caribbean	19	46%	33	80%	34	83%	34	83%	7	17%	15	37%	15	37%	26	63%	41
Middle East & North Africa	9	43%	16	76%	17	81%	18	86%	2	10%	2	10%	2	10%	2	10%	21
North America	1	33%	2	67%	3	100%	3	100%	2	67%	3	100%	3	100%	3	100%	3
South Asia	2	25%	4	50%	5	63%	5	63%	0	0%	3	38%	3	38%	3	38%	8
Sub-Saharan Africa	11	23%	35	73%	39	81%	42	88%	2	4%	6	13%	6	13%	10	21%	48
World	96	45%	156	73%	171	80%	176	82%	37	17%	47	22%	73	34%	96	45%	214

	Universal pensions								Targeted pensions								
Region	1960		1980		2000		2012		1960		1980		2000		2012		N
East Asia & Pacific	3	8%	4	11%	6	17%	7	19%	1	3%	1	3%	5	14%	8	22%	36
Europe & Central Asia	2	4%	2	4%	2	4%	2	4%	18	32%	21	37%	32	56%	35	61%	57
Latin America & Caribbean	2	5%	2	5%	3	7%	4	10%	5	12%	9	22%	12	29%	22	54%	41
Middle East & North Africa	0	0%	0	0%	0	0%	0	0%	2	10%	2	10%	2	10%	2	10%	21
North America	0	0%	0	0%	0	0%	0	0%	2	67%	3	100%	3	100%	3	100%	3
South Asia	0	0%	0	0%	0	0%	0	0%	0	0%	0	0%	3	38%	3	38%	8
Sub-Saharan Africa	1	2%	1	2%	4	8%	4	8%	1	2%	2	4%	2	4%	6	13%	48
World	8	4%	9	4%	15	7%	17	8%	29	14%	38	18%	59	28%	79	37%	214

Notes: The top panel reports the number of countries with contributory and non-contributory pensions and respective regional shares in 1960, 1980, 2000, 2012 and the lower panel reports the components of non-contributory pensions (universal and targeted pensions) and their shares in the same years.

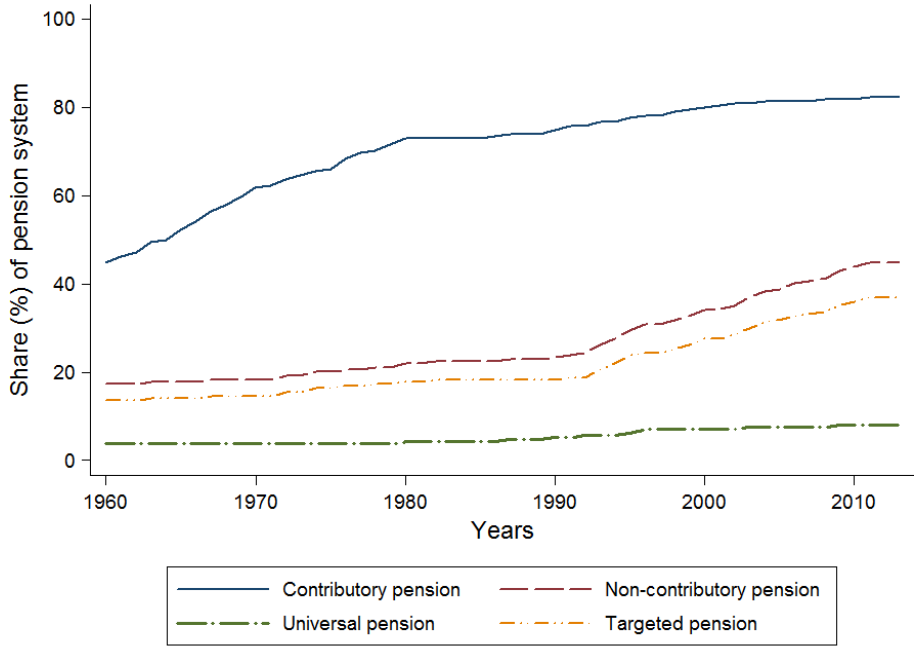
Distribution and trends

Looking at the development of pension programs worldwide in Figure 2, we see that the provision of earnings-related pensions has almost doubled since 1960. The major increase in the provision of contributory pension, covering the working population and being financed through contributions from employees and/or employers, is observed in the first two decades between 1960 and 1980. The only regions that still lack behind in earnings-related pension provision with only 69 and 63 percent of countries covered are East and South Asia (Table 1). All other regions show coverage of over 80 percent of countries with 100 percent coverage in OECD countries (ILO, 2014).

Social pensions are prevalent in 20 percent of countries already in the 1960s with only a minor increase until 1990 (from 17 percent to 24 percent of countries). In total we observe 37 countries (worldwide) that already in 1960 have a non-contributory pension. Most of these are from Europe and North America.[12] Since then major changes in the provision of non-contributory pensions worldwide took place and coverage of countries reaches almost 50 percent in 2012.

[12] These countries are: Armenia, Aruba, Australia, Barbados, Belarus, Bulgaria, Canada, China, Denmark, Dominican Republic, Estonia, Finland, Guyana, Iceland, Ireland, Isle of Man, Israel, Japan, Kyrgyz Republic, Latvia, Malta, Mauritius, Mexico, Netherlands, New Zealand, Norway, Poland, South Africa, Sweden, Switzerland, Trinidad and Tobago, Turkmenistan, Ukraine, United Kingdom, United States, Uruguay and Uzbekistan.

Figure 2: Development of pension provision between 1960-2012



Notes: Own calculations based on ILO (2014).

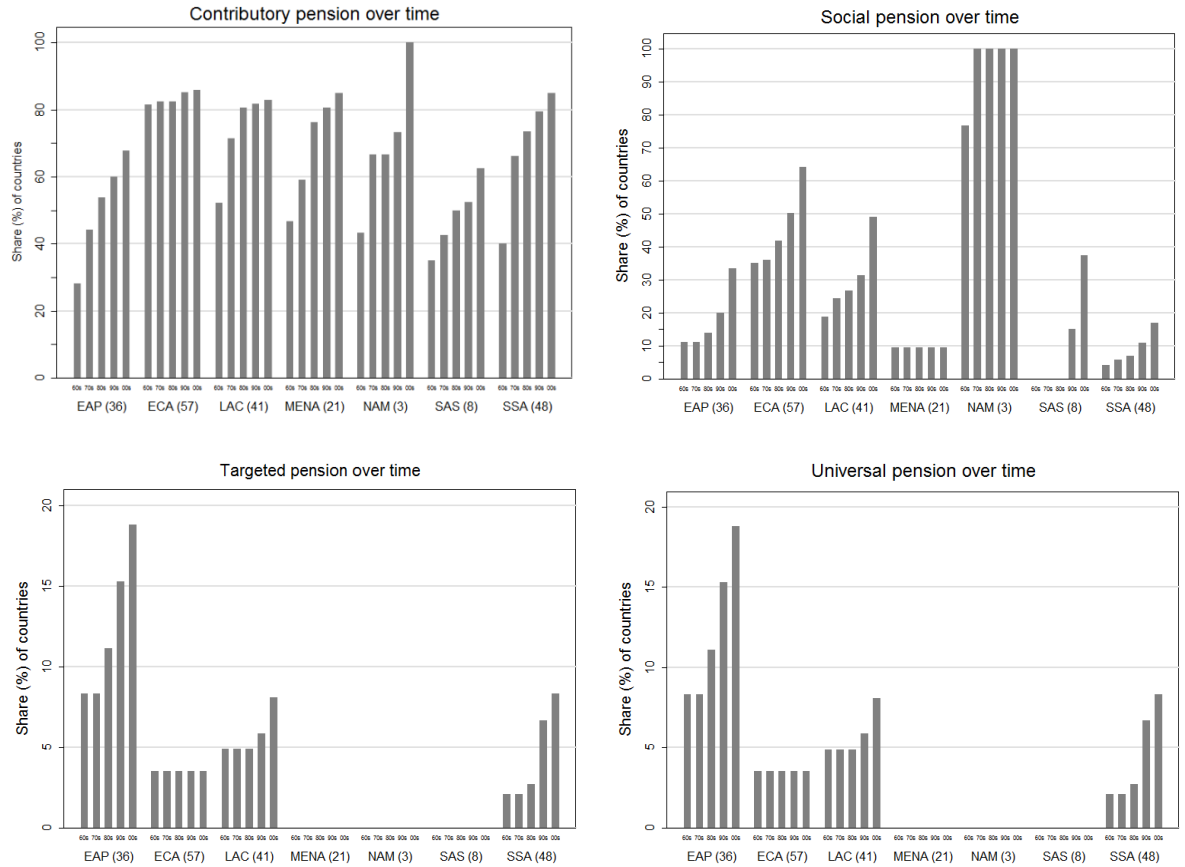
Principle reforms and implementation of social pension components within national pension systems are mainly observed since the 1990. In 2000 the share of countries has doubled compared to the level in 1960 and reached 34 percent of countries providing old age cash transfers

with major increases in Latin America and South Asia. In 2012 we find that 45 percent of countries have such pension systems where the major changes again are observed in Latin America with an increase of additional 27 percent (11 countries).

As shown in Figure 2, countries foremost provide targeted pensions that provide a conditional cash transfer to elderly with no other means of pension income. Countries in North America, Europe and Central Asia, Latin America and the Caribbean are the main providers of this form of social pension with more than 50 percent of countries of each region. Even eight countries in East Asia and six in Sub-Saharan Africa have such forms of pension in 2012.[13] In contrast,

[13] Countries providing targeted pension in 2012 In East Asia and the Pacific are Australia, Brunei Darussalam, China, Fiji, Hong Kong, Japan, Kiribati, Korea, Rep., Mongolia, New Zealand, Philippines, Samoa, Thailand, Vietnam. Countries in Sub-Saharan Africa are Botswana, Cabo Verde, Lesotho, Liberia, Mauritius, Mozambique, Namibia, Seychelles, South Africa and Swaziland.

Figure 3: Pension provision over decades (1960-2012)



Notes: Own calculations based on ILO (2014). EAP = East-Africa and the Pacific, ECA = Europe and Central Asia, LAC = Latin-America and the Caribean, MENA = Middle East and Northern-Africa, NAM = North America, SAS = South Asia, SSA = Sub-Saharan Africa. In parenthesis the number of countries in the respective regions in 20143

non-contributory universal pensions are only provided in eight percent of countries worldwide which represents to 17 countries in total. The largest share in this category is provided in East Asia with seven countries in total.[14] No changes and no uptake at all are observed in the provision of universal pension in North America, the MENA region and South Asia (see Table 1). In Latin America and Sub-Sahara Africa we find four countries respectively and two countries in Europe.[15] The different trends over the decades and continents are visualized in Figure 3. Interestingly we observe no changes in the MENA region and South Asia in targeted and universal pension. Since the coverage is 100 percent in social pension in North America since the 1970s we do not observe any changes in this region too. Another

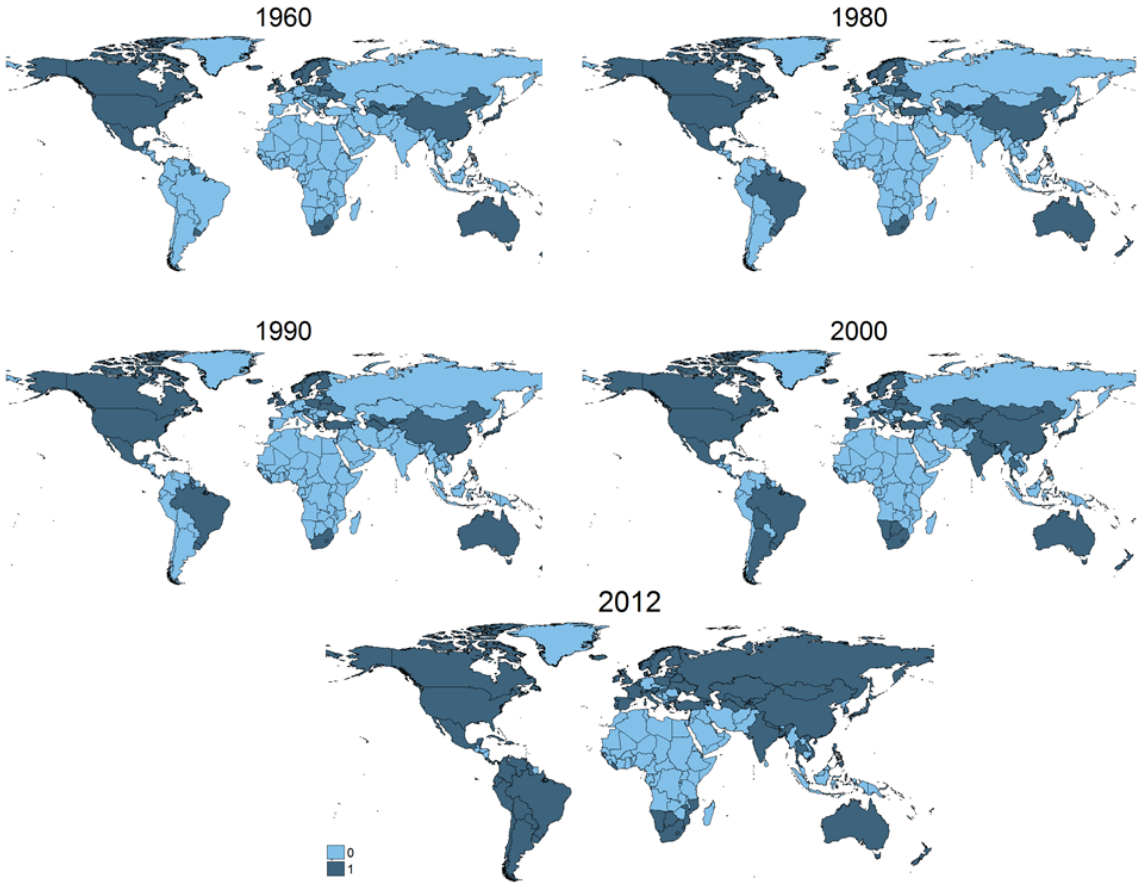
[14] These countries are Brunei Darussalam, China, Hong Kong, Japan, Kiribati, New Zealand and Samoa.

[15] These countries are Botswana, Mauritius, Namibia and Seychelles in Africa, Aruba, Bolivia, Guyana and Paraguay in Latin America, and Denmark and the Netherlands in Europe.

form of visualization can be found in Figure 4. Over the 60 years in the data set, Latin American countries are the first countries implementing social targeted pension followed by Central and Eastern Asia. The African continent is light coloured throughout the whole period with almost no changes.

Overall, we observe that targeted social pensions are more popular worldwide than universal pensions. Given that the latter is provided to the whole population solely based on age and citizenship, the difference may be explained by cost factors. We also see no reform efforts in contributory pensions in the last two decades whereas non-contributory pensions gained importance especially in that time period. The region that by fare lacks behind an anti-old-age poverty program in form of a social pension is the African continent, where except for the South (Namibia, Botswana and Mozambique) there are no major changes in colouring (light blue to dark blue) since the 1960s in Figure 4.

Figure 3: Distribution of social pension (world)



Notes: Own calculations based on ILO (2014).

III. Drivers of social pension: theory, evidence and hypotheses

Social pensions are a social security program with specific characteristics. We will address these aspects and develop testable hypotheses. The Universal Declaration of Human Rights[16] and the International Covenant on Economic, Social, and Cultural Rights[17] establish social security as a basic human right. This rights-based approach requires states and the international governance structure to provide a cash income in the form of a pension on a regular and predictable basis to the elderly (Bloom and McKinnon, 2013; Barrientos and Hulme, 2009). The redistributive nature of social non-contributory pensions is different from contributory pension schemes in that they are funded through general governmental revenues. Besides the argued cost-intensity of social pensions (especially of universal pensions) critics often regard the redistribution of resources between young and old (and rich and poor) as burdensome for productivity. Additionally, traditional support systems such as intra-family transfers or work-ethics may be further crowded out (Willmore, 2007).

The literature provides three lines of argument to explain the emergence and provision of social pensions through targeted government spending: economics and demographics, the political system and international transmission effects. After the initial investment of financial resources that are needed for the implementation of a pension system, annual governmental budgets need to be available to ensure long-term financial sustainability. Changing socio-economic conditions affect the financial stability of government resources and, as a consequence, determine the continuation of (tax-funded) non-contributory pension systems.

Control variables

The political economy literature focuses on the efficiency and cost effectiveness of such programs as main explaining factors. Positive theories suggest that efficiency concerns are the

[16] Adopted by UN General Assembly Resolution 217A (III) of 10 December 1948; Articles 22 and 25. Article 22: Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

Article 25: (1) Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old-age or other lack of livelihood in circumstances beyond his control. (2) Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

[17] Adopted by UN General Assembly Resolution 2200A (XXI) of 16 December 1966; Article 9.

Article 9: The States Parties to the present Covenant recognize the right of everyone to social security, including social insurance.

sole driver of social security provision (Sala-i-Martin, 1996; Tabellini, 2000), and consequently of social pension adoption and continuation. Accordingly, the key explanatory variables are economic and demographic factors, since those are central variables in determining sustainability in the expansion of government spending (Mulligan and Sala-i-Martin, 1999) as well as the tax base.

In political economy models of voting, pension reforms are adopted if the old and the middle aged form a majority voting coalition which cannot be defeated by younger generations (e.g., Cooley and Soares, 1999; Shoven and Slavov, 2006; Tabellini, 2000). Mulligan et al. (2010) show empirically that the share of the elderly population (older than 65) is a robust positive determinant of social security spending. Additionally, Mulligan and Shleifer (2005) demonstrate theoretically and empirically in a fixed cost theory of regulation that social security expenditures in general are driven by the size of the affected population and administrative costs. They argue that regulatory costs may be reduced if a similar jurisdiction is already in place. Countries in which contribution-based pensions exist, may be more inclined to also adopt a social non-contributory pension, since the institutional environment (i.e., agency responsible for the management of the program, lists of beneficiaries, legal environment, etc.) is already in place (Hugo and Cook, 2012). However, one could also expect those countries see no need in the adoption of social pension.

Overall, both economics and demographics are the principal variables in determining the adoption and persistence of a social pension. The control variables are: (ln) GDP per capita in international Purchasing Power Parity (PPP) from the Penn World Tables (PWT 8.1; Feenstra et al., 2015) and its square to account for the general economic situation of each country, state capacity and the general living standard. Given the large coverage in OECD countries, the relationship between the income level and social pension is likely to be non-linear. We expect it to positively affect social pension adoption at lower levels of income with decreasing probability at higher levels of income (Jung and Tran, 2012). Additionally, state capacity is determined by the savings rate, the ability of public and private actors to restore assets. We would either expect savings to positively affect the ability of the state to provide public pension or lower private savings (high current consumption) increasing the need for public support in old-age suggesting a negative relation. There are no clear predictions which effect dominates. The variables are from the WDI data set (World Bank, 2014).

Demographic characteristics are proxied by population growth, fertility and life expectancy rate at birth from the World Development Indicators (WDI; World Bank, 2014). A growing population is associated with an increase in the tax base and thus a positive correlation with the probability of social pension adoption. Decreasing fertility and increasing life expectancy are indicators of aging of societies. In general, the provision of old-age retirement income is positively related to the demographic composition of countries, because it determines the potential number of contributors and pensioners (Pallares-Miralles et al., 2012). In countries with high fertility rates the need for social pension provision might be less pressing since within-family support systems are still intact (Entwisle and Winegarden, 1984).[18] Controlung for the costs of implementation the existence of contributory pension is included to isolate the effect on social pensions.

Variables of interest

A second strand of political economy arguments emphasizes the role of political institutions in social security provision (Galasso and Profeta, 2002). Testing their predictions, Mulligan et al. (2004) find no difference between autocracies and democracies in the provision of different public policies. Similarly, Mulligan et al. (2010) find no differential effects in the size of retirement programs between democracies and autocracies once they control for economic and demographic variables. Giulliano and Mishra (2014) show that a democratic political system favours reforms in different economic sectors such as the financial sector, the capital and current account, the product and the agriculture market, and on the amount of trade. This could suggest that generally reforms are more likely in democracies. Case studies support this assumption regarding social pensions. Hugo and Cook (2012) present case studies from Asia and argue that a democratic political system facilitates the provision of social pension, because civil society alliances support the emergence of social welfare programs. General societal support is needed to motivate the implementation of such a program and to ensure that it is maintained. We test whether there is a differential impact in democratic compared to non-democratic regimes in the case of social pension provision. As a larger share of the voting population grows old, countries might be under pressure to reduce old-age in-

[18] Another potential demographic factor influencing the population composition of countries is migration. This is, however, still only a minor factor, according to Pallares-Miralles et al. (2012) depending heavily on the age structure of the migrants. Given the persistent low quality of migration data especially in a multi-country context we do not include it in our analysis.

come insecurity to please their electorate. Democracies might also be more likely to introduce social pension as a vote-maximizing strategy if the share of the elderly among voters increase. However, the same argument may be true for autocratic regimes since also an autocratic leader needs to please his elderly supporters.

Hypothesis 1: *The provision of social pension is more likely in democratic countries, ceteris paribus.*

To test Hypothesis 1, we use the democracy indicator of Cheibub et al. (2010) that is available for the 1960-2008 period. The dummy distinguishes between democratic regimes with electoral voting schemes to establish executive and legislative offices and autocratic regimes where this is not the case. The indicator has been widely used and is well accepted in the economic literature.[19]

A second source of differences in political institutions influencing targeted government spending are the ideological orientation of governments and the extent to which governments are fractionalized (e.g., Roubini and Sachs,1989a, b). First, the ideological orientation of governments shape targeted spending, because it is presumed that socialist parties if in power expand the welfare state. New evidence from a set of 55 different countries shows that socialist governments are in favor of state interventions and redistribution in order to reduce income inequality (Keefer and Milanovic, 2014).[20] In line with these observations, we would expect left oriented governments to be in favor of social pensions and have a higher probability of adoption. We use the measure of the party orientation of the chief executive provided by the Database of Political Institutions (DPI; Beck et al., 2001a, updated 2013), which distinguishes between right, left and centric orientation on a three-scale indicator. We generate a dummy variable that turns one for left-oriented governments and zero for right- or center-oriented governments. Thus, the effect of the variable compares the difference between left-oriented governments and other orientations and we would expect a positive effect.

Second, empirical results testing the impact of fractionalization show that it increases governments' deficits (Volkerink and de Haan, 2001) and the size of government spending, subsidies and transfers (Scartascini and Crain, 2002). Budgetary competition increases in

[19] We also use the Polity IV data set to test the predictions and the results are qualitatively the same.

[20] Several studies empirically show that party ideology matters in OECD countries in the allocation of grant aid to least developed and middle-income countries (Brech and Potrafke, 2014), and in German aid allocation (Dreher et al., 2015b). Fuchs et al. (2012), however, do not find a significant relationship in a worldwide sample of countries.

more fractionalized governments where each party seeks to please their own constituency (common pool problem) without internalizing the costs (Weingast et al., 1981). Topic-specific coalitions are formed ad-hoc by mutually agreeing to grant favours increasing log-rolling (Scartascini and Crain, 2002). In the context of social pensions, we would expect the probability of social pension adoption rising if governments are more fractionalized due to larger government spending. Thus, the composition of political institutions in the form of government fractionalization has been shown to influence government spending which would affect welfare expenditures in particular.

Hypothesis 2: *The strength of governments and its socialist orientation increase the probability of social pension provision, ceteris paribus.*

The most common variable to test this relationship is the government fractionalization index that mirrors the probability that two deputies picked at random from among the government parties will be of different parties (Beck et al., 2001a). We would expect a negative coefficient, since higher levels in the government fractionalization measure means more fractionalization.

Finally, sociology and political science literature on the expansion of social assistance suggests that national political processes are subject to international influence. Leisinger and Barrientos (2013) accord the main reason for the rise in the number of social pensions in the last decade to the international proliferation of social-policy innovations. Political constructivism and coercion theory predict diffusion of global norms through the international community (e.g., Dobbing et al., 2007). For instance, global norms might be diffused by multilateral organizations such as the World Bank or the IMF that often require policy reforms as condition for lending (e.g., Williamson, 1993, Gore, 2000). Dobbing et al. (2007: 451) emphasize that countries, which are subject to international leverage, such as trade, aid or security concerns, are more likely to adopt reforms promoted by powerful actors. Trade openness has been shown to increase social security spending in Latin American countries (Avelion et al., 2005) supporting the compensation perspective of increased international competition via higher social security support. In terms of pensions, Palacios and Sluchynsky (2006) show that, particularly in the area of pension, peer effects through policy transfer seem to lead to the introduction of mandatory contributory schemes in Latin America, Africa, the Middle East and Asia. This may also hold for non-contributory schemes.

Alternatively aid allocation could be another trigger. Aid does not include financial grants and loans only, but also technical assistance in form of expertise and knowledge on implementation, program design and sustainability. The allocation of development assistance has been shown to be influenced regularly by strategic considerations (Dreher et al., 2009a, b). On the one hand, aid that is rather politically motivated and/or tied to conditions including social security reforms may force countries to implement a social pension even if national conditions do not constitute a demand for increased social spending.[21] On the other hand, international support increases a government's budget and may lead to the expansion of national government spending. Studies show that development aid supports government's budget financed programs, such as social pensions (Bloom and Mc Kinnon, 2013) and that donors support social policies in recipient countries (Dreher et al., 2015a).

Following these arguments, we would expect that open countries and countries that are dependent on aid are more prone to international leverage increasing the probability of social pension adoption. The influence of international leverage in the adoption of social pension is tested using trade openness that is the ratio of exports and imports to GDP (World Bank, 2014). We use aid as a share of government expenditure (Aid/Gov.exp.) from the WDI data base to proxy for aid dependency (World Bank, 2014). We test the following hypothesis:

Hypothesis 3: *International leverage through trade and aid provision increases the probability of social pension implementation, ceteris paribus.*

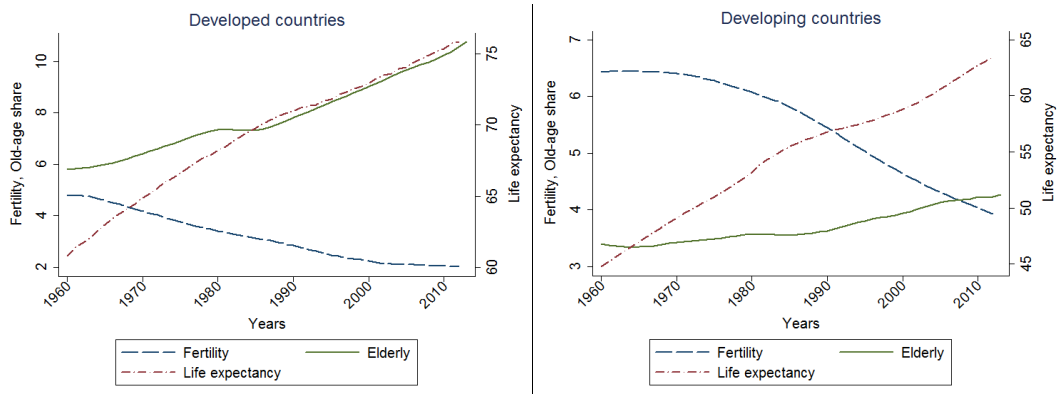
IV. Empirical analysis

Based on the deliberations in the last section, our empirical analysis focuses on three different types of variables: economic and demographic, political system, and international influence variables. The dependent variable is a binary indicator of whether or not a country has a social pension between 1960 and 2012. The unit of analysis is a country over a five-year period leading to a maximum of 1,205 observations, depending on the availability of control variables. We investigate what drives the implementation of social pension programs in the last five decades. In addition, we investigate whether drivers differ in developing compared to developed countries. Since we observe delayed demographic trends in developing countries, the decision to provide social pension may be different. In Figure 5 these different patterns

[21] Politically motivated aid has been shown to be attached to fewer conditions in IMF programs than in other forms of aid (Dreher et al., 2009a) and that it is less effective to increase economic growth (Dreher et al., 2013).

are visualized. In the left figure we show trends for developed and in the right panels for developing countries. The fertility rate is much lower and life expectancy is much higher in developed compared to developing countries. Additionally, we see that the rise in the share of elderly population reaches 10 percent in developed and only 4 percent in developing countries. This makes a separate assessment plausible.

Figure 5: Fertility, old-age population and life expectancy over time



Notes: Own calculation. Left figure shows development of fertility, life expectancy and share of the elderly population in industrialized countries, the right panel in developing countries. Developing countries are classified according to the World Bank with a yearly GNI per capita of up to US$4,125 (low income and low middle income countries according to the World Bank, 2014).

4.1 Method

We estimate the conditional probability of a country having a social pension by the duration adjusted probit model in the following general form:

$$P(Y_{it} = 1|X_{it-1}) = f(\alpha + \beta' X_{it-1} + \delta_r + \Lambda_t + \varepsilon_{it}) \qquad (1)$$

where i = 1, …,N, t = 1,…, T and Y_{it} indicates whether or not a country i has a non-contributory pension in period t, X_{it-1} is a vector of covariates, α is a common constant, β are parameters to be estimated and ε_{it} is the idiosyncratic multivariate normal error term. We use cluster robust standard errors that are clustered at the country level to allow for within country dependence over time. Additionally, δ_r controls for common income-related regional trends disaggregated into income levels. Since we observe different trends in high, middle and low income countries we disaggregate the regions along these lines and are, thus, able to capture heterogeneity within major world regions.[22] Beck, Katz and Tucker (1998) also show that "annual binary time series-cross sectional data are equivalent to grouped duration data with an observational interval of one year" (p. 1265) which can be estimated by an ordinary

[22] The most stringent estimator would be a within country estimator, however, given the structure of our data and the low variability of our dependent variable, the models do not converge.

probit or logit link controlling for duration dependence by including temporal dummies or splines.[23] We use a probit link ($f(.) = \phi(.)$) in order to appropriately model our binary dependent variable and use time dummies, Λ_t, to control for duration dependence in the application of social pensions. In the tables we report average marginal effects (AME) to interpret the sign, size and significance of the effects (Ai and Norton, 2003; Greene 2010). All explanatory variables are lagged by one period (five years).[24] Since social pension implementation is generally a long term process, pension experts suggest careful analysis and adequate planning and evaluation to put a social pension program into practice. Implementation of a new pension scheme is frequently accompanied by a preceding political decision making process and the subsequent establishment of new institutions which might take several years especially in less developed countries (e.g., Pigott et al., 2009).[25] By taking these structural adjustments in the implementation of social pension into account we are able to control for the sequence of events, but we are not able to rule out all forms of endogeneity which makes a causal interpretation of the findings difficult. We test additional channels of explanation later, first, to show that we identified the most important drivers of social pension adoption, and second, to reduce potential omitted variable bias. Our results are stable to these stress tests suggesting that endogeneity is no major concern in our setting.

4.2 Results and discussion

Table 3 reports the main findings using the duration adjusted probit models and displays average marginal effects (AME). The number of observations varies between 1205 and 821, depending on the availability of data. All regressions have a pseudo R squared over 0.36 and the Wald test p-values of joint significance highlight good model fit.

In terms of the demographic and economic variables we find savings, fertility rate and the existence of a contribution-based pension system to be statistically related to social pen-

[23] The authors show that by adjusting for duration dependence in ordinary logit or probit models the results mirror Cox proportional hazard models and are appropriate in the application of binary time series-cross section data (Beck et al. 1998).

[24] Summary statistics for all variables used are provided in Table A. 1 and a detailed description of variables and sources is provided in Table A. 2.

[25] The choice of the lag structure is somewhat arbitrary. All estimations have therefore been conducted using different lags. The results do not change qualitatively and are available from the authors. After discussions with Sandra Kissling, expert from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) responsible for the implementation of a social security system in India, on social pension implementation, we assume the one period lag to be the most plausible. Since the social pension variable takes a value of one if "laws and regulations are in force" it is plausible to assume that it takes around five years to implement such legislations. However, this includes no information on coverage or reach of the programs.

sion adoption. We will investigate the non-linear effect of GDP per capita later in more detail, even though the AME never turns statistically significant on conventional levels. The marginal effect of savings is significant at the 5 percent level. A decrease in the savings rate, thus, is systematically related to an increase in the probability to adopt social pension by 0.38 percent in column 1. This finding suggests that on average decreasing savings, and thus high preference for present consumption, increases the probability of social pension provision slightly. Presumably, countries that have a higher consumption level are more like to provide old-age security.

A decrease in the fertility rate is related to an increase in the probability to adopt a social pension program and provide against old-age poverty by public funds. The effect is negative and significant across all specifications. The average marginal effect of life expectancy on the probability of implementation is also negative, but only sometimes statistically significant at conventional levels. High fertility levels and similarly high life expectancy lower the probability of social pension adoption, ceteris paribus. This is in line with research from Entwisle and Winegarden (1984) who show that public pension and fertility rates and life expectancy are inversely correlated. Given the projections of an ongoing decrease of fertility and increase of life expectancy (Pallares et al. 2012) this relationship shows that the increase in demand for social pension is an important driver of the introduction of social pension. Increasing life expectancy goes hand in hand with an increase of costs for a rising share of the elderly, which is one possible explanation for negative correlation.

[Table 3 about here]

We also find that the existence of a contributory pension system is positively related to the probability of social pension adoption. Presumably, the existence of pension infrastructure reduces costs and increases the probability to also provide social non-contributory pension.

We now turn to the tests of our hypotheses. In column 2 we include an indicator of whether or not the country is a democracy testing for Hypothesis 1. We find that being a democracy increases the probability of social pension provision significantly at the 5 percent level finding support for our prediction. This is in contrast to Mulligan and Shleifer (2010) who find no difference between the two political systems. However, our result suggests that

participation in the political system supports the provision of social pension. The size of the effect indicates that providing for old-age income is 10 percent more likely in democracies than in autocratic regimes.

In column 3 we find evidence for hypothesis 2. While more fractionalized governments are less likely to provide social pension, socialist governments are associated with a positive effect on social pension provision. Both effects are statistically significant at the 10 and 1 percent level, respectively. Higher government fractionalization is regularly associated with weaker governments and a lower ability of fiscal deficit reduction (e.g., Roubini and Sachs, 1989a,b).[26] Since social pensions are financed by general budgetary spending, the government may need to increase taxes. Evidence suggests that the higher government fractionalization, the lower the ability to raise taxes and increase revenues, because of lower political support (Perotti and Kontopoulos, 2002). Our results add that this may translate into a lower probability of adoption of social pension. Note that in socialist governments compared to centre and right oriented governments the probability is 11 percent higher to adopt social pension. This finding is in line with Keefer and Milanovic (2014) who find that left oriented governments favour government provision of redistributive programs which seems to hold for social pension as well.

Finally, we investigate the importance of international factors for social pension adoption. The results indicate that we can reject our hypothesis of leverage through international forces. A higher probability of social pension introduction is associated with less open countries. The magnitude of the effect suggests that a one standard deviation increase in trade openness is associated with a 5 percent decrease in the probability of social pension provision. This is in contrast to expectations and suggests that there are indeed no policy transfer effects regarding non-contributory pension via commercial ties. Though, it could still be the case that it holds for contributory pension schemes. Presumably, countries may be forced to reduce their budget due to the diffusion of international crisis, which is easier in more open economies and demand austerity policies, thus reducing public good provision and social pension. This effect can be observed in the current economic crisis. The AME of aid depend-

[26] More fractionalized governments have also been found to have higher public spending and transfers (Volkerink and de Haan, 2001; Scartiscini and Crain, 2002; Bräuninger 2005), this does not seem to translate in social pension provision.

ency is negative, but not significant at conventional levels indicating that leverage through international financial support is not visible in our data.

In sum we find evidence for our hypothesis regarding democracies and the structure of government; however, we do not find evidence for international leverage through trade and aid.

[Table 4 about here]

We now turn to alternative variables that could be related to the probability of social pension adoption. Since the increasing share of the elderly population should theoretically increase the probability of social pension provision, we use this variable in column 1 in Table 4 instead of life expectancy. We find the AME to have the right sign, but not to be statistically significant at conventional levels. In column 2 we use the alternative measure of democracy provided by the Polity IV database (Marstall et al, 2014). This variable is a measure of democratic systems along three dimensions: regulation, competitiveness, and openness of executive recruitment; executive constraints; and regulation and competitiveness of political competition. It is widely available and highly correlated with the indicator we use in our main specification. It is scaled between 0 and 10 with higher values indicating the prevalence of sound democratic institutions to a larger extent. We generate a dummy variable that is 1 for values six or larger and 0 otherwise.[27] The finding suggests that the result for democracy does not depend on the definition of the variable. Looking at columns 3 to 6 we use further alternative measures: party fractionalization, foreign direct investment (FDI) share, multidimensional globalization (Dreher, 2006; Dreher et al., 2008), and official development assistance (ODA) as share of GNI[28] to challenge our results. We do find that a different specification of fractionalization focused on the legislature does not turn out to be relevant. However, since the initiation power to implement a social pension is largely located at the government level, we capture the influence of government strength more closely by employing government fractionalization. Using different measures for trade openness or aid dependency again does not support Hypothesis 3. Finally, in column 8 we test the influence of the size of gov-

[27] The cutting value is suggested by the authors of the indicator and has been used in the literature before (Marshall and Jaggers, 2002, Rudra and Haggard 2005).

[28] ODA/GNI differs from the aid to government expenditure measure in that it does not include financial flows to more advanced countries of Central and Eastern Europe (World Bank, 2014).

ernment. We find a positive and significant relation at the 5 percent level. Thus, higher government expenditure relates to a higher probability of social pension provision. This is not surprising since social pensions are part of government expenditures. Interestingly, the democracy effect and the savings effect vanish in this specification. This suggests that the size of the government is one channel through which democracies provide for social pension.[29]

As described before we observe different demographic trends in developed and developing countries. In order to analyse whether these have an influence on our findings we introduce a dummy variable that is one if the country is a developing country following the income classification of the World Bank and we interact it with our explanatory variables. Specifically, the dummy is 1 if the country has a yearly gross national income (GNI) per capita equal to or less than US$4,125. In Table 5 we report the most interesting variables for developed countries in the upper part of the table and developing in the lower part.

[Table 5 about here]

We find interesting differences in the two country groups. The average marginal effects for income and savings do not turn statistically significant for developed countries, whereas the AMEs of fertility and life expectancy are negative and statistically significant at the 1 percent level throughout all specifications for this country group. In accordance with the generally very low level of fertility and its decreasing trend we find a high demand for social pension adoption here. In comparison to developing countries (lower panel), this does not seem to be the case. In this country group we find that the income level is significantly related to social pension adoption where the effect is first increasing and then decreasing with rising income level. Moreover, we find that the savings rate is significantly and negatively related to the probability of social pension adoption. Contrary to the developed countries, we see no systematic relation between fertility and the probability of social pension implementation. Presumably, a large part of the elderly population is still cared for through within family transfers and the need for social pension is still lower. Given demographic trends (Figure 5), we expect a rising demand in the future.

Turning to our variables of interest we find that being a democracy seems to matter in the set of developing countries whereas it is not systematically related to social pension adoption in the developed country sample. This also explains the difference to the result of

[29] There is little evidence on whether democracies have larger government budgets than non-democracies. Theoretical predictions even suggest the opposite (e.g., Mulligen et al., 2004 and references cited therein).

Mulligan and Shleifer (2010), because they only look at developed countries and for this sample we also observe no difference between democracies and non-democracies. However, in democratic developing countries the probability of social pension adoption itself seems to be higher compared to non-democratic countries. The same holds for government fractionalization. We do not find an effect different from zero in developed but in developing countries. In the latter group the effect is not robust to the inclusion of additional variables in column 6. Finally, socialist governments are associated with a higher probability of social pension adoption in developed countries, but not in developing countries. We do not find any effect between the two groups regarding the size of governments (column 4). Overall, we observe that different factors matter in these two sub-samples. Demand seems to be important in developed countries while we find state capacity and strength of government to play a more important role in developing countries.

Finally, we dig deeper into the relationship between democratic regimes and social pension provision. First, it may be the case that we do not only observe differences in country groups, but that it also plays a role whether the democratic system is strongly established. We expect more established democracies to have a higher probability of social pension provision. In order to address this, we use the system tenure measure of the DPI data set (Beck et al. 2001) and interact it with our democracy dummy. We also investigate whether the effect of government fractionalization differ between democratic and non-democratic systems. Table 6 shows the AMEs for both interaction effects and Figure 6 displays the average marginal effects of democracy over system tenure and government fractionalization, respectively. In Table 6 we find that in democracies the tenure of the system is positively related to the adoption of social pension, significant at the 1 percent level. In the figure we see that it turns significant when the system is strongly established for more than 30 years indicating that established democracies have a higher probability of social pension adoption. For government fractionalization there is no differential effect in democracies.

[Table 6 and Figure 6 about here]

Another aspect of non-linear models is that the marginal effects of interactions may be very heterogeneous at different observation levels and individually significant for a subset of observations. The average marginal effects hide this type of heterogeneity which may be of special interest if the effect switches sign. We investigate these non-linearities for three inter-

action effects whether this is the case and show the results graphically in Figure 7.[30] The figure graphs the distribution of AMEs for the interaction terms of GDP per capita, system tenure and fractionalization both with democracy over the predicted probability of non-contributory pension adoption, as well as the associated z-statistic with the 95 percent confidence bands. The figure shows that all three interaction terms are clearly non-linear. Looking at the income level we find that the effect includes positive and negative values in an S-shape. We find positive significant marginal effects in the form of an inverse U-shape relation at lower probabilities of social pension adoption, whereas the marginal effect is negative at higher probabilities of social pension. The effect is positive and significant for around 29 percent of the observations. It is negative and significant for around 25 percent of the observations and ranges overall from -55 percent to 53 percent. This large share of significant results suggests that the income level is likely to be of some importance for the probability of social pension adoption. As we have shown before this seems to be especially relevant in developing countries.

[Figure 7 about here]

The interaction effect of democracy and system tenure is inverse U-shaped throughout the distribution. The marginal effect is positive and significant for 51 percent of the predicted observations where we observe an increase in the effect for lower probabilities of social pension adoption and decreasing marginal effects at higher levels of adoption probability. The AMEs range from 0 to 16 percent. Clearly the large share of significant values indicates that the age and establishment status of the democratic system matter for the provision of public old-age pension. This would explain the low coverage in many developing countries, where besides low state capacities the political system is not mature enough to provide public funds for the elderly. Turning to the interaction of democracy with government fractionalization, we again find the marginal effects distributed in a U-shape. A fraction of 43 percent is individually significant at the 5 percent level. The effect ranges from -2 to 66 percent and thus is quite large although on average we do not find a relevant relationship.

[30] We use the routine of Norton et al. (2004) to analyse the non-linear effect of GDP per capita.

To summarize, so far, we are not aware of a study looking at determinants of social pension introduction in a broad set of countries looking specifically at the differences in a systematic framework. We find support for the relevance of economic and demographic variables. The analysis reveals that efficiency concerns are more important for social pension adoption in developing countries, whereas demographics, and thus the demand to provide public funds, rather drive social pension introduction in developed countries. Furthermore, the adoption is shaped by the political system and its structure. This lends support to Hypotheses 1 and 2. We first find support for the notion that democracies have a higher probability of social pension provision (*H1*). This is especially relevant in developing countries. The probability increases with the stability of the system. The results also suggest a supporting role of the political system and its structure (*H2*). On the one hand, we find that the higher the government fractionalization the lower seems to be the probability of non-contributory pension provision, indicating that weaker governments especially in developing countries are less like to provide against old-age poverty. On the other hand, our results point to a higher probability in the provision of social pension in socialist governments especially in developed countries. Third, there is no evidence in the data that international leverage through trade or aid influences the provision of social pension at the national level. Although the topic is very present on the global governance agenda, the relation to national legislation is weak.

V. Conclusions

In this paper we, first provide a comprehensive desciption of social pension concepts, investigate the distribution of pension programs around the world including contributory and non-contributory pensions. Social pensions as anti-poverty cash transfer pensions are defined in accordance to the World Bank zero pillar pension as non-contribution-based pensions provided in the form of targeted (means-tested) or universal funds (Holzman and Hinz, 2005). So fare, this paper is the first to broaden the view beyond contribution-based pensions including information on the provision of social pension in developed and developing countries.

Second, we analyse if social pensions are determined by the political system and international leverage factors controlled for economic and demographic variables. We use duration adjusted probit models to disentangle the role of the socio-economic conditions, of

political institutions and international relations. In contrast to the existing literature that mainly focusses on spending behaviour and to a large extent on OECD countries, we formally examine hypotheses in a large set of countries and include all relevant aspects at once.

As expected economic and demographic factors have differing influence depending on the country group. In countries where traditional support structurs break down, due to decreasing fertility, and thus higher demand for public old age support, the probability of implementation increases. State capacity measured by the income level and savings are systematically related to the adoption of social pension in low income countries.

Different political institutional characteristics matter in different country contexts. Compared to autocratic regimes, democracies have a higher probability of social pension introduction foremost in developing countries, but they need to be stable and established for at least three decades for the effect to be systematically important. While in more fragmented governments the chance of social pension adoption decreases, this seems to be foremost the case in developing countries. Socialist governments are more inclined in state interventions which seems to support the probability of social pension provision in developed countries.

A next step in this line of research will be the analyis of the effectiveness of social pensions in terms of coverage rates and success in decreasing old-age poverty. Both aspects are not covered here, due to scarce data availability. Furthermore, the availability of more data will allow for the application of additional techniques and a more in depth analysis of endogeneity concernse. However, our findings show systematic evidence of important factors shaping the provision of public redistributive polcies.

It is of high relevance to policy makers and pension practitioners, who are willing to end poverty in all its forms and especially address old-age poverty, to identify the necessary factors and conditions for social pensions to be effective. The demand for instruments to fight old-age poverty in the light of demographic trends and aging of society is of utmost importance if the global community is willing to end poverty in all its forms until 2030. We show that social pension is a succesful tool increasingly implemented across countries (industrialized and developing). However, since only around 50 percent of countries worldwide provide their elderly with such a public pension option there is still leeway for countries to increase their social protection in this direction. Especially for developing

countries this might only be affordable if state capacity increases and participatory system are strongly established. International actors are not found to influence national decision making processes through commercial ties or aid provision. The 2030 Agenda provides a window-of-opportunity for action now to improve social protection systems. This research provides evidence-based insights into implementation chances and caveats and might contribute to the process to fight against old-age poverty.

References

Ai, C. and E.C. Norton (2003). "Interaction terms in logit and probit models" *Economics Letters* 80, 123-129.

Allan, J.P. and L. Scruggs (2004). " Political Partisanship and Welfare State Reform in Advanced Industrial Societies." *American Journal of Political Science* 48(3), 496-512.

Avelion, G., D.S. Brown and W. Hunter (2005). "The Effects of Capital Mobility, Trade Openness, and Democracy on Social Spending in Latin America 1980-1999." *American Journal of Political Science* 49(3), 625-641.

Barrientos, A., M. Gorman and A. Heslop (2003). "Old Age Poverty in Developing Countries: Contributions and Dependence in Later Life." *World Development* 31(3), 555-570.

Barrientos, A. and D. Hulme (2009). "Social Protection for the Poor and Poorest in Developing Countries: Reflection on a Quiet Revolution." *Oxford Development Studies* Vol. 37(4), 439-456.

Beck, T., G. Clarke, A. Groff, P. Keefer, and P. Walsh (2001a). "New tools in comparative political economy: The Database of Political Institutions." *World Bank Economic Review* Vol. 15(1), 165-176; updated January 2013.

Bloom, D.E., D. Canning, R.K. Mansfield and M. Moore (2007). "Demographic change, social security systems, and savings." *Journal of Monetary Economics* Vol. 54(1), 92-114.

Bloom, D.E. and R. McKinnon (2013). "The Design and Implementation of Public Pension Systems in Developing Countries: Issues and Options," IZA Policy Paper No 59 and PGDA Working Paper No. 102.

Brech, V. and N. Potrafke (2014). "Donor ideology and types of foreign aid," *Journal of Comparative Economics*, 42, 61-75.

Cheibub, J., Gandhi, J., and J.R. Vreeland (2010). "Democracy and dictatorship revisited." *Public Choice* 143, 67-101.

Chomik, R. and E. Whitehouse (2010). "Trends in pension eligibility ages and life expectancy, 1950-2050," OECD, Social Employment and migration working papers no. 105.

Cooley, T.F. and J. Soares (1999). "A Positive Theory of Social Security Based on Reputation," *Journal of Political Economy* 107 (1), 135-160.

Dobbing, F., B. Simmons and G. Garrett (2007). "The Global Diffusion of Public Policies: Social Construction, Coercion, Competition, or Learning?" *Annual Review of Sociology* 33, 449-472.

Dreher, A. (2006). "Does globalization affect growth? Evidence from a new index of globalization." Applied Economics, 38, 1091-1110.

Dreher, A., N. Gaston and P. Martens (2008). "Measuring globalisation: Gauging its consequences," New York, Springer.

Dreher, A., J.-E. Sturm and J. R. Vreeland (2009a). "Global Horse Trading: IMF Loans for Votes in the United Nations Security Council." *European Economic Review* 53 (7), 742-757.

Dreher, A., J.-E. Sturm and J. R. Vreeland (2009b). "Development Aid and International Politics: Does membership on the UN Security Council influence World Bank decisions?" *Journal of Development Economics*, 88, 1-18.

Dreher A., V. Eichenauer and K. Gehring (2013). „Geopolitics, Aid and Growth", CESifo Working Paper Series No. 4299. Available at SSRN: http://ssrn.com/abstract=2290915.

Dreher, A., K. Gehring and S. Klasen (2015a). "Gesture politics or real commitment? Gender inequality and the allocation of aid," *World Development* 70, pp.464-480.

Dreher, A., P. Nunnenkamp and M. Schmaljoahnn (2015b). „The Allocation of German Aid: Self-interest and Government ideology," *Economics and Politics* 27(1), 160-184.

Entwisle, B. and C. R. Winegarden (1984). "Fertility and Pension Programs in LDCs: A Model of Mutula Reinforcement," Economic Development and Cultural Change 32(2), 331-354.

Fuchs, A., A. Dreher and P. Nunnenkamp (2012). "Determinants of Donor Generosity: A Survey of the Aid Budget Literature." *World Development* 56, 172-199.

Galasso, V. and P. Profeta (2002). "The political economy of social security: a survey," *European Journal of Political Economy* 18, 1-29.

Greene, W. H. (2010). "Testing hypotheses about interaction terms in nonlinear models." *Economics Letters*, 107, 291–296.

Gruber, J. and D. Wise (1997). "Social security programs and retirement around the world." NBER working paper no. 6134.

Gruber, J. and D. Wise (2002). "Social security programs and retirement around the world: Micro estimation." NBER working paper no. 9407.

Gruber, J. and D. Wise (2005). "Social security programs and retirement around the world: Fiscal implications". NBER working paper no. 11290.

Gruber, J., K. Milligan and D. Wise (2009). "Social security programs and retirement around the world: The relationship to youth employment, introduction and summary." NBER working paper no. 14647.

HelpAge International (2014). Pension Watch: Social Protection in older age; http://www.pensionwatch.net/about-social-pensions/about-social-pensions/social-pensions-database/. Accessed: Septmber 5, 2014.

Holzmann, R. and R. Hinz (2005). "Old age income support in the 21st century: An international perspective on pension systems and pension reform," World Bank.

Holzmann, R. (2012). "Global pension systems and their reform: Worldwide drivers, trends and challenges." *International Social Security Review* Vol. 66(2), 1-29.

Hugo, K. and S. Cook (2012). "The Political Economy of Social Pension Reform in Asia." In: Handayani, S.W. and B. Babajanian (Eds.), Social Protection for Older Persons: Social Pension in Asia, Asian Development Bank, Mandaluyong City, Philippines.

ILO (2014). "World Social Protection Report 2014-2015: Building economic recovery, inclusive development and social justice." International Labour Organization, Geneva, Switzerland.

Jung, J. and C. Tran (2012). "The extension of social security coverage in developing countries." *Journal of Development Economics* Vol. 99(2), 439-458.

Kaushal, N. (2014). "How Public Pension affects Elderly Labor Supply and Well-being: Evidence from India." *World Development* Vol. 56, 214-225.

Keefer, P. and B. Milanovic (2014). "Party age and party color: New results on the political economy of redistribution an inequality." Policy Research Working paper 7129, World Bank Group.

Leisinger, L. and A. Barrientos (2013). "Social citizenship for the global poor? The worldwide spread of social assistance," *International Journal of Social Welfare*, 22, 50-67.

Marshall, M. G. and K. Jaggers (2002). Polity IV dataset. College Park: University of Maryland, Center for International Development and Conflict Management.

Marshall, M., T. Gurr and K Jaggers (2014). Political Regime Characteristics and Transitions, 1800-2013, Polity IV Project, Center for Systematic Peace and Societal Systems Research Inc. Colorado.

Mulligan, C. B. & Sala-i-Martin (1999) "Social Security in Theory and Practice (I): Facts and Political Theories," NBER working paper no. 7118.

Mulligan, C.B., R.Gil, and X. Sala-i-Martin (2004). "Do democracies have different public policies than non-democracies?" *Journal of Economic Perspetives* Vol. 18(1), 51-74.

Mulligan, C.B. and A. Shleifer (2005). "The extent of the market and the supply of regulation." *Quarterly Journal* of *Economic* Vol. 120(4), 1445-1473.

Mulligan, C.B., R. Ricard and X. Sala-i-Martin (2010). "Social security and democracy." *The B.E. Journal of Economic Analysis & Policy* Vol. 10(1), 1-46.

Norton, E. C., H. Wang and C. Ai (2004). " Computing interaction effects and standard errors in logit and probit models," *The Stata Journal*, 4(2), 154-167.

OECD (2013). "Pensions at a glance 2013: OECD and G20 indicators." Organisation for Economic Co-operation and Development. Paris, France.

Palacios, R. and O. Sluchsynsky (2006). "Social Pensions Part I: Their role in the overall pension system," Social Protection Discussion Paper No. 0601.

Pallares-Miralles, M., C. Romero and E. Whitehouse (2012). "International patterns of pension provision II: A worldwide overview of facts and figures." World Bank, Social Protection Discussion papers no. 70319.

Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table" forthcoming *American Economic Review,* available for download at www.ggdc.net/pwt

Perotti, R. and Y. Kontopoulos (2002). "Fragmented fiscal policy," *Journal of Public Economics*, 86, 191-222.

Przeworski, A., M. E. Alvarez, J. A. Cheibub, and F. Limongi (2000). "Democracy and Development: Political Institutions and Well-Being in the World, 1950-1990." Cambridge, UK: Cambridge University Press.

Przeworski, A. and J. R. Vreeland (2002). "A Statistical Model of Bilateral Cooperation." *Political Analysis* 10(2): 101–112.

Roubini, N. and J. Sachs (1989a). "Government Spending and Budget Deficits in the Industrial Countries," *Economic Policy*, 8, 99–132.

Roubini, N. and J. Sachs (1989b). "Political and Economic Determinants of Budget Deficits in the Industrial Economies," *European Economic Review*, 33(5), 903–938.

Sala-i-Martin, X. (1996). "A Positive Theory of Social Security," *Journal of Economic Growth* Vol. 1(2), 277-304

Scartascini, C. and W. M. Crain (2002). "The size and composition of government spending in multiparty systems," available at SSRN 1353462.

Shoven, J.B. and S.N. Slavov (2006). "Political Risk versus Market Risk in Social Security," NBER working paper no. 12135.

SSPTW (2014). Social Security Programs Throughout the World, Social Security Administration (SSA), USA. http://www.ssa.gov/policy/docs/progdesc/ssptw/ (November 27, 2014).

Tabellini, G. (2000). "A Positive Theory of Social Security," *Scandinavian Journal of Economics* 102(3), 523-545

UN (2014). "World Population Prospects: The 2012 Revision". United Nations, New York. http://esa.un.org/wpp/Excel-Data/population.htm. Accessed: 4 September 2014.

UN (2015). "Transforming our world: The 2030 agenda for sustainable development". A/RES/70/1, United Nations, New York.

Volkerink, B. and J. de Haan (2001). „Fragmented government effects on fiscal policy: New evidence," *Public Choice* 109(3-4), 221-242.

World Bank (1994). "Averting the old age crisis." World Bank: Washington DC

World Bank (2009). "Closing the coverage gap – The role of social pensions and other retirement income transfers." World Bank, Edts: R. Holzmann, D.A. Robalino and N. Takayama.

World Bank (2014). World Development Indicators. Online database. World Bank: Washington DC.

Weingast, B., K. Shepsle, and C. Johnson (1981). "The political economy of benefits and costs: a neoclassical approach to redistributive politics." *Journal of Political Economy*, 642-664.

Whitehouse, E., A. D'Addio, R. Chomik and A. Reilly (2009). "Two decades of pension reform: What has been achieved and what remains to be done?" *The Geneva Papers on Risk and Insurance – Issues and Practice* Vol. 34(4), 515-535.

Williamson, J. (1993). "Democracy and the Washington consensus," *World Development* Vol. 21, 1329–1336.

Willmore, L. (2007). "Universal pensions for developing countries," *World Development* Vol. 35(1), 24-51.

Willmore, L. (2012) Types of Social Pensions, http://larrywillmore.net/SocialPensions.pdf. Accessed: 2 September 2014.

Wolf, F., R. Zohlnhöfer and G. Wenzelburger (2014). The Politics of Public and Private Pension Generosity in Advanced Democracies, *Social Policy and Administration* 48(1), 86-106.

Regression Tables

Table 2: Determinants of social pension adoption

	(1)	(2)	(3)	(4)	(5)
(ln) GDP pc	0.4018	0.4585	0.2494	0.2134	0.0194
	(0.314)	(0.319)	(0.367)	(0.289)	(0.346)
(ln) GDP pc squared	-0.0165	-0.0202	-0.0093	-0.0054	0.0042
	(0.018)	(0.018)	(0.021)	(0.017)	(0.020)
Population growth	0.0062	0.0107	0.0004	0.0325	0.0313
	(0.017)	(0.017)	(0.019)	(0.023)	(0.028)
Savings	-0.0038**	-0.0032**	-0.0032*	-0.0038**	-0.0035**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Fertility rate	-0.1016***	-0.0988***	-0.1281***	-0.1287***	-0.1589***
	(0.024)	(0.024)	(0.029)	(0.026)	(0.032)
Life expectancy rate	-0.0056	-0.0072*	-0.0088*	-0.0077*	-0.0106**
	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)
Contributory pension	0.2451***	0.2195***	0.1919**	0.2193***	0.1643**
	(0.068)	(0.068)	(0.084)	(0.066)	(0.083)
Democracy		0.0917**	0.1017**		0.0768*
		(0.046)	(0.048)		(0.046)
Gov. fractionalization			-0.1394*		-0.1701**
			(0.081)		(0.076)
Party orientation (left)			0.1155***		0.1141***
			(0.035)		(0.034)
Trade share				-0.0010**	-0.0011**
				(0.001)	(0.001)
Aid/Gov.exp.				0.0001	-0.0001
				(0.000)	(0.000)
# of Observations	1205	1205	854	1150	821
# of Countries	161	161	152	160	149
pseudo R-squared	0.36	0.37	0.38	0.38	0.40
Wald test (p-value)	0.00	0.00	0.00	0.00	0.00
Log Likelihood ratio	-504.74	-498.94	-362.00	-470.19	-336.44

Notes: The dependent variable is a binary indicator, whether or not the country has a social pension. Average marginal effects reported. Standard errors in parentheses clustered at the country level. Significance levels: * p<0.1, ** p<0.05, ***p<0.01. All models include time-period and regional dummies (World Bank region classification). Explanatory variables lagged by one period.

Table 3: Alternative variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Elderly Population	0.0083						
	(0.012)						
Democracy (Polity IV)		0.1349***					
		(0.050)					
Party fractionalization			-0.0606				
			(0.090)				
FDI/GDP				0.0036			
				(0.008)			
Globalization					0.0013		
					(0.003)		
ODA/GNI						-0.0004	
						(0.003)	
(ln) Gov. exp. pc							0.1246***
							(0.034)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
#Obs	757	757	755	740	783	732	624
#Countries	136	136	136	136	138	130	132
pseudo R-squared	0.43	0.45	0.43	0.43	0.40	0.43	0.46
Wald test (p-value)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Log Likelihood ratio	-297.13	-288.25	-297.12	-289.17	-322.98	-284.96	-232.11

Notes: The dependent variable is a binary indicator, whether or not the country has a social pension. Average marginal effects reported. Standard errors in parentheses clustered at the country level.

Significance levels: * p<0.1, ** p<0.05, ***p<0.01. All models include time-period and regional dummies as well as the full vector of controls of specification 5 Table III.3 less the variable that we exchanged. Explanatory variables lagged by one period.

Table 4: Determinants of social pension (country groups)

	(1)	(2)	(3)	(4)	(5)	(6)
Developed countries						
(ln) GDP pc	0.0548	0.0556	-0.3967	-0.3472	0.0461	-0.5088
	(0.459)	(0.464)	(0.409)	(0.460)	(0.484)	(0.442)
(ln) GDP pc squared	0.0023	0.0028	0.0288	0.0244	0.0019	0.0349
	(0.029)	(0.029)	(0.025)	(0.028)	(0.031)	(0.027)
Savings	-0.0011	-0.0012	-0.0012	-0.0012	-0.0012	-0.0015
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.002)
Fertility rate	-0.1654***	-0.1561***	-0.1727***	-0.2105***	-0.1746***	-0.1721***
	(0.047)	(0.045)	(0.048)	(0.063)	(0.049)	(0.046)
Life expectancy rate	-0.0146***	-0.0148***	-0.0161***	-0.0170**	-0.0156***	-0.0156***
	(0.005)	(0.005)	(0.006)	(0.007)	(0.006)	(0.006)
Democracy		-0.0004	0.0333	0.0342		0.0248
		(0.049)	(0.039)	(0.045)		(0.037)
Gov. fractionalization			-0.1054	-0.1339*		-0.1072
			(0.075)	(0.079)		(0.073)
Party orientation (left)			0.1106***	0.1101**		0.1208***
			(0.037)	(0.046)		(0.036)
(ln) Gov. exp. pc				0.0090		
				(0.042)		
Developing countries						
(ln) GDP pc	1.9975***	1.3585*	0.6749	1.0488	2.2354***	1.2481
	(0.730)	(0.808)	(0.622)	(0.707)	(0.860)	(1.002)
(ln) GDP pc squared	-0.0986**	-0.0671	-0.0317	-0.0468	-0.1101**	-0.0611
	(0.039)	(0.043)	(0.033)	(0.040)	(0.045)	(0.052)
Savings	-0.0085***	-0.0063***	-0.0085**	-0.0102*	-0.0084***	-0.0067
	(0.002)	(0.002)	(0.004)	(0.006)	(0.003)	(0.005)
Fertility rate	0.0327	0.0375	0.0747	0.1757*	0.0157	0.0414
	(0.035)	(0.034)	(0.062)	(0.105)	(0.037)	(0.058)
Life expectancy rate	0.0117	0.0105	0.0096	0.0141	0.0124	0.0053
	(0.008)	(0.009)	(0.015)	(0.019)	(0.010)	(0.014)
Democracy		0.1588**	0.2671**	0.1901		0.2963***
		(0.066)	(0.108)	(0.141)		(0.102)
Gov. fractionalization			-0.2084*	-0.2429*		-0.1684
			(0.126)	(0.133)		(0.110)
Party orientation (left)			0.0192	0.0092		0.0091
			(0.056)	(0.059)		(0.044)
(ln) Gov. exp. pc				-0.0087		
				(0.090)		
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
# of Observations	1205	1205	854	710	1150	821
# of Countries	161	161	152	150	160	149
pseudo R-squared	0.42	0.43	0.45	0.47	0.42	0.47

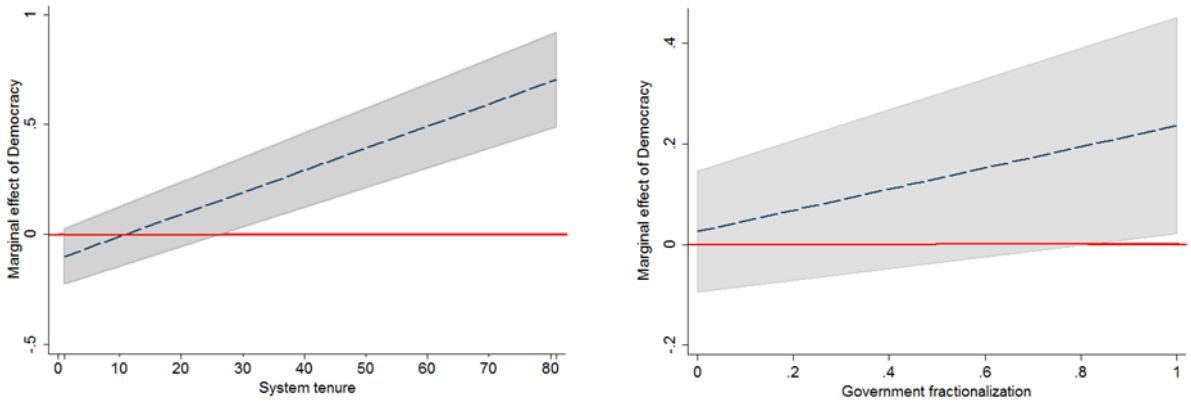
Notes: The dependent variable is a binary indicator, whether or not the country has a social pension. Average marginal effects reported. Standard errors in parentheses clustered at the country level. Significance levels: * p<0.1, ** p<0.05, ***p<0.01. All models include time-period and regional dummies. Explanatory variables lagged by one period. Developing countries defined as maximum GNI per capita of US$4,125 or lower, countries with a higher yearly GNI are classified as developed countries.

Table 5: Democracy interaction effects

	(1)	(2)
Democracy	-0.4409*	0.1083
	(0.249)	(0.253)
Gov. fractionalization	-0.9108***	-1.5267***
	(0.336)	(0.520)
Gov.frac # Democracy		1.0434
		(0.671)
System tenure	-0.0477***	
	(0.015)	
System tenure # Democracy	0.0649***	
	(0.016)	
Controls	Yes	Yes
#Obs	821	821
#Countries	149	149
pseudo R-squared	0.41	0.39

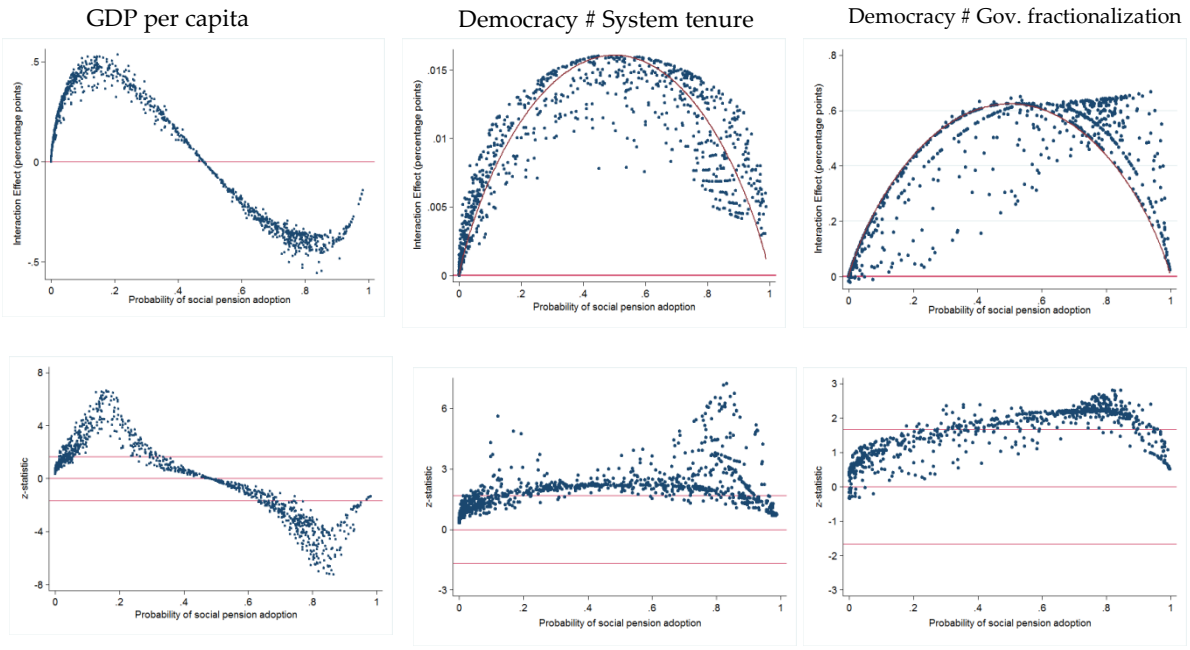
Notes: The dependent variable is a binary indicator, whether or not the country has a social pension. Average marginal effects reported. Standard errors in parentheses clustered at the country level. Significance levels: * p<0.1, ** p<0.05, ***p<0.01. All models include time-period and regional dummies. Both specifications include the vector of controls of specification 5 table 3 all lagged by one period.

Figure 6: Marginal effects



Notes: The left figure shows the average marginal effect of democracy with increasing system tenure based on column 1 in Table 6 and the right panel shows the average marginal effect of democracy with increasing government fractionalization based on column 2.

Figure III. 3: Effect of interaction terms in probit models



Notes: The upper panel shows the non-linear partial effects of GDP per capita, democracy depending on system tenure and government fractionalization on the probability of social pension adoption. In the lower panel the respective z-statistics with a 95 percent confidence band are displayed (cut-off values +/- 1.96).

Appendix

Table A.1: Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min.	Max.
Social pension	1205	0.371	0.483	0	1
(ln) GDP pc	1205	8.516	1.207	5.49	11.73
Population growth	1205	1.740	1.364	-4.64	15.51
Savings	1189	17.925	15.389	-80.93	83.23
Fertility rate	1203	3.796	2.002	0.87	8.42
Life expectancy	1203	64.752	11.371	21.78	83.29
Contributory pension	1205	0.880	0.325	0	1
Democracy	1205	0.422	0.494	0	1
Gov. fractionalization	959	0.200	0.253	0	1
Trade share	1193	80.484	50.561	8.42	442.64
Elderly population	1195	6.276	4.324	1.24	21.04
AID/Gov.exp.	1136	35.365	59.504	-0.96	623.73
Party orientation (left)	1205	0.234	0.424	0	1
System tenure	1028	20.447	19.043	1	82
Democracy (Polity2)	1205	0.426	0.495	0	1
Fractionalization	956	0.510	0.271	0	1
FDI/GDP	1089	3.488	5.601	-17.51	66.15
Globalization	1132	49.342	17.993	13.09	92.30
ODA/GNI	1124	4.875	7.774	-0.12	93.17
(ln) Government expenditure	936	6.117	1.809	1.25	9.55

Notes: Summary statistics include number of observations (Obs.), mean, standard deviation (Std. Dev.), minimum (Min.) and maximum (Max.) of the respective variable.

Table A.2: Variables and sources

Variable	Description	Source
Social (non-contributory) pension	Dummy variable that takes the value 1 if the country has a social (non-contributory) pension, 0 otherwise	ILO (2014)
Contributory pension	Dummy variables that is 1 if the country has a retirement scheme based on earnings and contribution or a provident fund; 0 otherwise	ILO (2014)
(ln) GDP pc	Natural logarithm of real GDP per capita at chained Purchasing Power Parities (constant 2011 US$)	Penn World tables 8.1 (2014)
Fertility rate	Fertility rate is the rate of all births per woman	WDI (World Bank, 2014)
Life expectancy	Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life.	WDI (World Bank, 2014)
Savings rate	Gross domestic savings are calculated as GDP less final consumption expenditure (total consumption), plus net transfers.	WDI (World Bank, 2014)
Elderly population	Total population 65 and older as share of total population	WDI (World Bank, 2014)
Democracy	Dummy variable that is one if electoral determination of executive and legislative offices are existent; 0 otherwise.	Cheibub et al. 2010
Party orientation (left)	Dummy that is one for a left oriented government and zero if right or center oriented. Based on Chief Executive Party Orientation; Right (1); Left (3); Center (2); No information (0);	Beck et al. (2001a) updated Jan. 2013
Government fractionalization	The probability that two deputies picked at random from among the government parties will be of different parties. Equals NA if there is no parliament.	Beck et al. (2001a) updated Jan. 2013
Party fractionalization	The probability that two deputies picked at random from the legislature will be of different parties. Equals NA if there is no parliament.	Beck et al. (2001a) updated Jan. 2013
Trade share	Trade is the sum of exports and imports of goods and services measured as share of GDP.	WDI (World Bank, 2014)
Globalization	Multidimensional index: economic, political and social globalization: 1 (not globalized) - 100 (fully globalized)	Dreher 2006, Dreher et al. (2008); Version 2013.
AID/Gov. expenditure	Net official development assistance and official aid received as share of total government's expenses.	WDI (World Bank, 2014)
ODA/GNI	Net official development assistance (ODA) received (% of GNI)	WDI (World Bank, 2014)
Democracy (Polity 2)	Institutionalized democracy along three dimensions: regulation, competitiveness, and openness of executive recruitment; executive constraints; and regulation and competitiveness of political competition.	Marshall et al. (2014)
System tenure	Reports the number of years the country has been autocratic or democratic	Beck et al. (2001a) updated Jan. 2013

Table A.3: List of countries per region (N = 214)

Region	Country	Region	Country	Region	Country	Region	Country
Europe & Central Asia	Albania	East Asia & Pacific	American Samoa	Latin America & Caribbean	Antigua and Barbuda	Sub-Saharan Africa	Angola
	Andorra		Australia		Argentina		Benin
	Armenia		Brunei Darussalam		Aruba		Botswana
	Austria		Cambodia		Bahamas, The		Burkina Faso
	Azerbaijan		China		Barbados		Burundi
	Belarus		Fiji		Belize		Cabo Verde
	Belgium		French Polynesia		Bolivia		Cameroon
	Bosnia and Herzegovina		Guam		Brazil		Central African Republic
	Bulgaria		Hong Kong SAR, China		Cayman Islands		Chad
	Channel Islands		Indonesia		Chile		Comoros
	Croatia		Japan		Colombia		Congo, Dem. Rep.
	Cyprus		Kiribati		Costa Rica		Congo, Rep.
	Czech Republic		Korea, Dem. Rep.		Cuba		Cote d'Ivoire
	Denmark		Korea, Rep.		Curacao		Equatorial Guinea
	Estonia		Lao PDR		Dominica		Eritrea
	Faeroe Islands		Macao SAR, China		Dominican Republic		Ethiopia
	Finland		Malaysia		Ecuador		Gabon
	France		Marshall Islands		El Salvador		Gambia, The
	Georgia		Micronesia, Fed. Sts.		Grenada		Ghana
	Germany		Mongolia		Guatemala		Guinea
	Greece		Myanmar		Guyana		Guinea-Bissau
	Greenland		New Caledonia		Haiti		Kenya
	Hungary		New Zealand		Honduras		Lesotho
	Iceland		Northern Mariana Islands		Jamaica		Liberia
	Ireland		Palau		Mexico		Madagascar
	Isle of Man		Papua New Guinea		Nicaragua		Malawi
	Italy		Philippines		Panama		Mali
	Kazakhstan		Samoa		Paraguay		Mauritania
	Kosovo		Singapore		Peru		Mauritius
	Kyrgyz Republic		Solomon Islands		Puerto Rico		Mozambique
	Latvia		Thailand		Sint Maarten (Dutch part)		Namibia
	Liechtenstein		Timor-Leste		St. Kitts and Nevis		Niger
	Lithuania		Tonga		St. Lucia		Nigeria
	Luxembourg		Tuvalu		St. Martin (French part)		Rwanda
	Macedonia, FYR		Vanuatu		St. Vincent and the Grenadines		Sao Tome and Principe
	Moldova		Vietnam		Suriname		Senegal
	Monaco	Middle East & North Africa	Algeria		Trinidad and Tobago		Seychelles
	Montenegro		Bahrain		Turks and Caicos Islands		Sierra Leone
	Netherlands		Djibouti		Uruguay		Somalia
	Norway		Egypt, Arab Rep.		Venezuela, RB		South Africa
	Poland		Iran, Islamic Rep.		Virgin Islands (U.S.)		South Sudan
	Portugal		Iraq	North America	Bermuda		Sudan
	Romania		Israel		Canada		Swaziland
	Russian Federation		Jordan		United States		Tanzania
	San Marino		Kuwait	South Asia	Afghanistan		Togo
	Serbia		Lebanon		Bangladesh		Uganda
	Slovak Republic		Libya		Bhutan		Zambia
	Slovenia		Malta		India		Zimbabwe
	Spain		Morocco		Maldives		
	Sweden		Oman		Nepal		
	Switzerland		Qatar		Pakistan		
	Tajikistan		Saudi Arabia		Sri Lanka		
	Turkey		Syrian Arab Republic				
	Turkmenistan		Tunisia				
	Ukraine		United Arab Emirates				
	United Kingdom		West Bank and Gaza				
	Uzbekistan		Yemen, Rep.				

*Note*s: Classification according to the World Bank (World Bank 2014).