When the State Mirrors the Family: The Design of Pension Systems

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Abstract

This paper studies the transmission mechanism from family culture to economic institutions, by analyzing the impact of the within family organization on the original design of the public pension systems. We build a simple OLG model with families featuring either weak or strong internal ties. When pensions systems are initially introduced, in society with strong ties they replicate the tight link between generations by providing earnings related benefits; whereas in societies with weak family ties they only act as a safety net. To test this transition mechanism, we consider Todd (1982) historical classification of family types across countries. We find that in societies dominated by absolute nuclear families (i.e., weak family ties), pension systems act as a flat safety net entailing a large within-cohort redistribution, and viceversa in societies characterized by stronger family ties where pension systems are more generous. This link between the type of families and the design of pension systems is robust to testing for alternative explanations, such as legal origin, religion, urbanization and democratization of the country at the time of their introduction. Interestingly, historical family types matter for explaining the design of the pension systems, which represents a persistent feature, but not their size, which have largely changed over time.

JEL-Code: Z10, Z13, N30, H10, H55.

Keywords: culture, institutions, historical evidence.

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1 Introduction

Institutions matter for economic development and growth.[1] A recent literature has emphasized the impact of pre-existing legal, political and economic institutions on economic development, income inequality, labor force participation of household members, living arrangements and even fertility decisions (see, among the others, Putnam, 1993, Tabellini, 2008 and 2009, Fernandez and Fogli, 2009, Guiso et al., 2006). Whether these historical institutions affect social-economic outcomes through their impact on current institutions or through a less tangible, cultural transmission process is instead less understood (Tabellini, 2009).

In this paper, we focus on the role of what is arguably the primal institution: the family. We emphasize the economic relevance of the historical patterns of the within family organization. The organization of the family structure includes the relation between parents and kids, from their childhood till their parents' old age; the relation among siblings, for instance vis-a-vis the inheritance from their parents; and the relation between the family as a unit and the society at large. These primal aspects of the family organization can be transmitted over time, codified in the law, or even embedded into newly born economic institutions. Our point of departure is that when the family is substituted in one of its economic roles by a new institution, the economic organization that was prevailing within the family is likely to be adopted by the new-born institution. To study this transmission mechanism from family culture (or organization) to economic institutions, we concentrate on the impact of the family structure on the design of the most widely spread welfare state program in the world: the public pension system.

Before the introduction of public pension systems, which largely occurred between the beginning of the XX century and the aftermath of world war II, families were almost the unique providers of old-age security for their elderly members. However, the organization of the within-family insurance system largely differed across regions and family types. For instance, while in some countries, such as England, kids had no legal obligation to support their parents, in France, they were morally, but also legally reliable for their elderly parents' health and economic situations (see Twigg and Grand, 1998). In the latter families, parents could hence rely on their offsprings for complete old age support, to an extent that of course depended on their own and on their kids' economic conditions. In the former case, instead, upward vertical support (from the kids to their parents) was less common, and effectively consisted of a safety net, whenever parents fell into

[1] See, among the others, the seminal works by Acemoglu et al. (2001), North (1990), La Porta et al. (1997).

poverty. Our goal is thus to understand to what extent the principles governing the family organization have influenced the design of pension systems since their introduction, shaping those fundamental characteristics that are still present in the current systems, and that differentiate them across countries. Did the initial design of pension systems mirror the within family organization? Did countries characterized by families providing strong vertical support in old age favor the emergence of earning-related insurance schemes that replace a large share of the workers' previous wage? And did countries characterized by weak children responsibility for the old age consumption of their parents endorse flat-rate pension schemes providing only a safety net to the elderly?

To give an answer to these fundamental questions, we first build a simple two-periods OLG model to analyze the link between the structure of family and the design of pensions. We analyze two family structures characterized by weak and strong family ties, and hence by different within family organizations. We consider two economic and demographic scenarios. In an "old regime", family members lived close to one another and the cost of providing resources to the elderly was small. In a "new regime", arising for instance from industrialization, urbanization and similar processes, which induce nuclearization of the family, family members tend to be more spread out geographically, and the cost of transferring resources to the elderly increases. Our model shows that, in the "old regime", individuals in societies characterized by weak family ties are more likely to save than those in strong family ties. In the "new regime", pensions are more likely to emerge under weak rather than under strong family ties. However, if they emerge, pension systems are more comprehensive and generous in societies with strong family ties, where they come to substitute the kids to old parents family transfers. Also in societies with weak family ties, pensions reflect the pre-existing family organization and thus only provide a safety net.

To test the predictions of our model on the initial design of pension systems, we consider a historical analysis of family structures. We use Emmanuel Todd's classification of medieval family types (Todd, 1983) to analyze how the different types of within family organizations shape the fundamental characteristics of the initial design of the different pension systems, which are still present in the current systems. We classify four family organizations in four types - absolute nuclear, egalitarian nuclear, authoritarian, communitarian - delivering a complete picture of the family relationships in each region of the world since medieval era, which proved to be persistent over time. In particular, absolute nuclear families (dominating in Anglo-Saxon countries, Holland and Denmark) feature a high degree of within family independence – both for parents in their inheritance decisions, and for their children – and thus present weak family ties, as opposed to the other types

of families.

Our empirical findings suggest that in countries where absolute nuclear families prevail, pension schemes act mainly as a flat safety net. To define the design of the pension system, we consider replacement rates, which measure the ratio between pension benefits and labor income prior to retirement, for different income levels. If a pension system replaces a constant proportion of the workers' income, these replacement rates will be roughly constant across income levels. On the other hand, they will widely differ - being higher for low-income workers, if the pension system acts as a safety net. [2]

This link between the family type and the design of pension systems is robust to including several other variables, which may constitute alternative explanations of the introduction of the pension systems, such as legal origin, religion, urbanization and democratization of the country at the time of the introduction, the current GDP, share of elderly in the population, electoral rules and forms of government. Interestingly, historical family types matter for explaining the design of the pension systems, which constitutes a persistent feature, but not their size, which has instead largely changed over time.

A simple comparison may help to appreciate the relevance of the family organization in shaping the design of pension systems. Consider four, geographically closed countries characterized by the same (Scandinavian) legal origin, such as Denmark, Finland, Norway and Sweden. According to Todd classification, Norway and Sweden featured authoritarian families, Finland was characterized by a communitarian family structure, while Denmark was based on absolute nuclear families. Also the design of their pension system differs. With a ratio of the pension replacement rates across income levels (respectively at 75% and at 150% of the average wage) equal to 1.6, and an average replacement rate of 54%, the weak-family-ties Denmark stands out for its safety net like, highly redistributive pension system. Norway and Sweden also have somewhat redistributive (their ratio of replacement rates across income being respectively 1.25 and 1.09), but more generous systems, with an average replacement rate equal to 65.1% and to 68.2%. On the other hand, Finland, which is characterized by a communitarian family structure, features a perfectly Bismarckian pension system (the ratio of replacement rates across income is equal to 1), with an average replacement rate of 78.8%.

A recent literature has analyzed the role of the family as a primal institution affecting

[2] As we will explain in section 3.2, pension schemes with an earnings-related formula are typically referred to as "Bismarckian" systems, while flat-rate ones as "Beveridgean" systems. See Disney and Johnson (2001), Conde-Ruiz and Profeta (2007), OECD(2005) for a classification of current pension systems according to their redistributive design and Conde-Ruiz and Profeta (2007), Koethenburger et al. (2008) for political-economy explanations of their different nature.

economic outcomes, and its role of intergenerational transmission of culture. For instance, Alesina and Giuliano (2007) claim that the strength of family ties represents a fundamental cultural trait shaping economic behavior and attitudes. They elaborate a measure of culture based on family relationships and quantify its role in explaining important economic variables, such as the amount of home production versus market activities and the role of women. A previous argument by Reher (1998) also pointed out that family ties help explaining living arrangements and geographical mobility of young generations. Indeed, the link between family types and individual economic behavior dates back to Banfield (1958), who first used the term "amoral family" to describe the social and cultural environment that was shaping individual decisions in a small village in the south of Italy. More recently, Duranton et al. (2009) used Todd's (1983) medieval age family structures to explaining regional differences in economic outcomes. Algan and Cahuc (2007) shows that family culture is responsible for cross-country heterogeneity in employment rates. Alesina et al. (2010) argue that in cultures with strong family ties individuals are less mobile and prefer more regulated labor market while weak family ties are associated with more flexible labor markets, which then require higher geographic mobility of workers to be efficient.[3] All these papers consider the family culture to be persistent over time. Bisin and Verdier (2001) and Tabellini (2008) endogenize this cultural transformation mechanism by showing how rational, altruistic parents may optimally choose to transmit their family values to their children.

The link between family relations and welfare systems has also received a recent attention, mainly by sociologists. Focusing on Europe, Esping-Andersen (1999) argues that where family ties are stronger, social risks are more internalized in the family by pooling resources across generations. Other authors have stressed the impact of gender culture on the welfare state (Lewis, 1992) and the role of Christian religion in European welfare state (Daly, 1997). Coleman (1988) argues that family ties can strengthen the support received by young generations from the old while, at the same time, representing an obstacle for innovation and new ideas. Finally, Pfau-Effinger (2005) emphasizes the link between culture and welfare state policies, as she argues that welfare state policies differ according to the underlying cultural model of the family, and to how much importance is attributed to

[3] The impact of cultural factors on individual economic decisions is also analyzed in Guiso, Sapienza and Zingales (2006), who, after providing a definition of culture ("those customary beliefs and values that ethnic, religious, and social groups transmit fairly unchanged from generation to generation"), analyze as a specific example the impact of religion or ethnic origins on trust and on preferences for redistribution. See also Fernandez (2007) for a survey of some of the recent empirical studies on the effects of culture on economic outcomes.

the family for the production of welfare.

This paper is also related to a recent literature on the origin of welfare. According to several authors (for a discussion, see Caucutt, Cooley and Guner, 2007, and Cutler and Johnson,2004), Pay-As-You-Go pension systems that feature intergenerational transfers from workers to retirees were introduced in the western world around the period of urbanization. The rationale for the creation of a public transfer system was the rapid change from the existence of an extended family living in the same house to smaller families dislocated in many different places, due to the urbanization. In this new setup, kids were unable to look after their parents providing for their old age needs and new forms of insurance had to be introduced. Yet, this general theory has hard time matching the timing of the urbanization process with the introduction of social security systems (see e.g., Lindert, 1994, and Perotti and Schwienbacker, 2007). Our relation between family types and the initial design of the social security system instead does not rest on a specific date for the introduction of social security.

The paper is organized as follows: section 2 explains the model, section 3 presents a historical perspective on family ties drawing on Todd's classification, and discusses the origins of pension systems and their design; section 4 describes our econometric analysis and results and section 5 concludes. Proofs are in the Appendix.

2 The Model

We introduce a simple two-periods OLG model to analyze the link between family structure and pension design. We consider two stylized family structures: strong and weak family ties. These two structures differ in the rules, which define within-family property rights, sharing of resources and degree of insurance. We also introduce two different scenarios. In an initial "old regime", family members and relatives tend to live close to one another. Hence, while family may feature weak or strong ties, the cost of looking after a family member (i.e. the elderly) is relatively low. We then consider a "new regime" driven for instance by industrialization, urbanization and similar processes, in which a nuclearization of the family has occurred, and looking after the old has become more costly for both weak and strong ties families.

The next section introduces a description of these two family structures. The main economic decisions taken within the family for these two family types in the "old regime", and the collective decision over pension systems are examined in the next section. An analysis of these decisions under the "new regime" follows.

2.1 Strong and weak family ties

At each time t two generations of equal size are alive: adult and old. We consider a simple utility function that is linear in consumption c. An individual born at time t has the following utility function

$$U\left(c_t^A, c_{t+1}^o\right) = c_t^A + c_{t+1}^o \tag{1}$$

where the superscripts indicate the generation (adult, old) and subscripts refer to the time period.

Adults earn a constant income y and may save to increase the (family or individual) resources in old age. During a fraction ρ of their old age, individuals enjoy high returns from savings, equal to $(1+\overline{R})$, while during a fraction $(1-\rho)$ the returns are low and equal to $(1+\underline{R})$, with $\overline{R} > \underline{R}$. It is convenient, but not crucial, to assume that $1+\underline{R} = 0$. Thus, the average returns from savings are $(1+R) = \rho\left(1+\overline{R}\right)$.

Old individuals do not work. They obtain the returns from their savings, and may receive a pension. Consumption in old age is given by $c_{t+1}^o = \rho c_{t+1,\overline{R}}^o + (1-\rho)c_{t+1,\underline{R}}^o$where $c_{t+1,\overline{R}}^o$ and $c_{t+1,\underline{R}}^o$ are old age consumption respectively in the high and low returns state.

If a pension system is in place, adults pay a proportional tax τ_t on their income, and these revenues are used to provide pension benefits to the elderly. Pensions are distortionary, as captured by a parameter $\varepsilon > 0$. The PAYG pension system is budget-balanced:

$$P_t = (1-\varepsilon)\tau_t y \tag{2}$$

Economic decisions are taken within the family. We consider two different family types. In families with strong ties, all the resources obtained by the two generations of individuals are pooled within the family, under the direct control of the adults. Total resources of the two generations at time t are used to finance the family consumption and the savings:

$$y(1-\tau_t) + P_t + s_{t-1}(1+R) = c_t^A + c_t^o + s_t \tag{3}$$

Old individuals have no property rights on these resources, and thus also on the income that they may contribute to provide, such as savings and pensions. Adults have a moral (or perhaps even legal) obligation to provide an adequate level of consumption to the old, irrespective of their contribution to the family resources. We capture this obligation by imposing a constraint on the old consumption:

$$c_{t,j}^o \geq \gamma y \qquad (j = \overline{R}, \underline{R}) \tag{4}$$

Hence, regardless of the state of the economy (that is, whether the returns on savings are high or low), adults have to ensure a (large) percentage γ of their income to the old

family members. This is to capture the idea that in family with strong ties, adults have to guarantee to their parents a high standard of living, which is similar to their own.

Families with weak ties feature a different structure. No pooling of resources takes place among family members and old have property rights on their savings and pensions. However, the adults still have a moral (or legal) obligation to keep each old family member above a subsistence consumption level, δy, with $\delta < 1$, if the old does not have enough resources. This limited degree of within family insurance is represented by the following constraint on the individuals' consumption:

$$c^o_{t,j} \geq \delta y \qquad (j = \overline{R}, \underline{R})$$

Finally, for both weak and strong family ties, we assume that adults have to provide themselves at least with a subsistence consumption level, $c^A_t \geq \theta y$, and thus have to refrain from saving all the available resources for future consumption. Notice that, in absence of this constraint, this extreme (saving) behavior may arise under some specifications, due to the linearity in the utility function.

To capture the idea that in families with weak ties the adults only provide a safety net, whereas in strong families they share consumption more evenly among the family members, we assume that $\delta \leq \min(\gamma, \theta)$.

To characterize the emergence of a pension system, we consider that the introduction of the system is decided upon by the current adult generation, and that the system has to be supported by all future generations of adults.

In the following sections, we analyze the economic decisions taken in families with strong and weak ties in the old and in the new regime. We also examine the collective decisions over the pension system.

2.2 The "Old Regime"

2.2.1 Strong family ties

In the "old regime", adult individuals living in families with strong ties have control of the common pool of family resources. They decide how much to save, and how to share consumption across family members, and there is no transaction cost in transferring resources to the elderly. Saving amounts to reduce the resources in the period when the adults have control over the consumption decision, in order to increase the family pool of resources in the next period, when they are old and have no property rights. It is easy to see (see Proposition 1 below) that, regardless of the return on the savings, adults have no incentive to save, and hence $s_t = 0$. As all the current family resources are used to

finance current consumption, the adults will maximize their own consumption subject to the constraint at eq. 4 that characterizes a strong family.

Proposition 1 *In absence of transaction costs in providing resources to the elderly (the "old regime"), a strong family features no savings, $s_t = 0$ and the adults oppose the introduction of a pension system, $P_t = \tau_t = 0$.*

In strong families, the existence of a common family pool of resources managed by the adults limits their incentive to save for the future. In this environment, a pension system is not supported. In fact, its introduction would amount to tax the adults by an amount $\tau_t y$ and to provide back resources to the old equal to $P_t = (1 - \varepsilon)\tau_t y$. For any positive level of distortion, $\varepsilon > 0$, pensions are thus opposed.

2.2.2 Weak family ties

When family ties are weak, there is no pooling of resources and every generation has property rights on its own income. Adults only have a moral obligation to keep elderly family members at a subsistence level of consumption equal to δy.

It is convenient to consider first what happens in absence of a pension system. Unlike in strong families, in this environment adults have more incentives to save for old consumption, since (i) they have property rights on their savings, and (ii) they will only be guaranteed a minimum subsistence level from their offsprings, if they reach old age with no resources. Due to the linear utility function, their saving decision will be binary. If they choose to save, adults will transfer into old age all their disposable income, consisting of their adult income, y, net of the transfers to the old members of their family and of their own subsistence consumption. When old, in good times, they will use their savings to consume, and will rely on the subsistence family transfers in bad times only. If instead the adults prefer not to save, they will consume all their disposable income, and they will always rely on the subsistence family transfers in old age. The following proposition characterizes the equilibrium of the economy.

Proposition 2 *In absence of transaction costs in providing resources to the elderly (the "old regime"), the following equilibria may arise:*

- *If $R < \frac{\delta\rho}{1-\delta-\theta}$, a weak family features no savings, $s_t = 0$ and the adults oppose the introduction of a pension system, $P_t = \tau_t = 0$.*
- *If $R > \frac{\delta\rho}{1-\delta-\theta}$, a weak family features positive savings, $s_t > 0$ and the adults still oppose the introduction of a pension system $P_t = \tau_t = 0$*

In weak families, for high values of the return rate R, the existence of within family property rights induces the adults to remain at subsistence consumption and to save. These savings increase their old age consumption in the good states. In the bad states, instead, the elderly have to rely on the transfers from their offsprings to reach the subsistence level of consumption. For low values of the return rate R, instead, the adults will choose not to save.

In both cases, a pension system fails to be supported. In fact, not only the pension system is distortionary, but its introduction amounts for the adults to transfer resources to the elderly in every state of the world (rather than in the bad state only), and therefore either reduces the amount of resources available for the savings (when $s_t > 0$) or their consumption when adults (when $s_t = 0$).

2.3 The "New Regime"

In the initial "old regime", families were assumed to be geographically concentrated, with family members living close to one another – if not together. Hence, the cost of looking after the old was relatively low, although in different families (weak or strong) adults were required to perform different roles.

In this section, we consider the economic decisions by these two families in a "new regime", due for instance to industrialization, urbanization and similar processes, which imposed an exogenous nuclearization of the family. We characterize this "new regime" with two crucial elements: (i) an exogenous increase in the cost of providing resources to the elderly, due for instance to the increased geographical distance between the adults and their parents, so that every unit of consumption provided to the elderly costs $1+\phi$ to their offsprings; and (ii) the acquisition of property rights over their savings by the elderly in the strong families, due again to a possible geographical separation among family members. The moral obligation by the adults towards their parents – and hence the family culture – remains however unmodified.

2.3.1 Strong family ties

This "new regime" may cause large adjustments in the internal organization of strong families. Strong families may continue with their organization, and just choose to pay the higher cost of providing resources to the elderly; or the adults may exploit the newly established property rights over their savings, and choose to save for old age. Even more importantly, changes may occur to the adults' preferences over the introduction of a pension system, which may become a good substitute for private transfers to the elderly. The

proposition below summarizes the economic decisions taken in a strong family during the "new regime", and the collective decision over the pension system.

Proposition 3 *In presence of transaction costs in providing resources to the elderly and of property rights of the elderly (the "new regime"), the following equilibria may arise:*

- *If* $R < \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)}$, *a strong family features no savings,* $s_t = 0$. *Adults support the introduction of a pension system* $P_t = \tau_t y\,(1-\varepsilon)$, *with* $\tau_t = \frac{\gamma}{1-\varepsilon}$, *if and only if* $\phi > \frac{\varepsilon}{1-\varepsilon}$.
- *If* $R > \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)}$, *a strong family features positive savings,* $s_t > 0$. *Adults support the introduction of a pension system* $P_t = \tau_t y\,(1-\varepsilon)$, *with* $\tau_t = \frac{\gamma}{1-\varepsilon}$, *if and only if* $\phi > \frac{\varepsilon}{1-\varepsilon} - \frac{\rho}{1+R}$

For low rate of returns R, although saving for old age consumption has now become an option for the adults, who have acquired property rights in old age, they choose not to save. In this case, the adults may just have to bear the higher transaction cost of providing resources to the elderly. Alternatively, if this cost is high and/or the pension system is sufficiently efficient, i.e., if $\phi\,(1-\varepsilon) > \varepsilon$, they prefer to delegate the support of the elderly to a pension system. In this case, the public pension system will perfectly resemble the family transfer, as $P_t = \tau_t y\,(1-\varepsilon) = \gamma y$.

For high values of the return from savings, R, adults in strong families choose to remain at subsistence consumption when adult and to save to increase their old age consumption. The adults will provide this subsistence consumption to the elderly. However, if the transaction cost is high and/or the pension system is not very inefficient, i.e., if $\phi > \frac{\varepsilon}{1-\varepsilon} - \frac{\rho}{1+R}$, the adults will choose to delegate even this minimal support of the elderly to a pension system, which would provide $P_t = \gamma y$. Notice that a pension system is more likely to be introduced when savings are positive.

2.3.2 Weak family ties

In the "new regime", the cost of providing consumption to the elderly, when their savings are not sufficient to reach the subsistence level, increases. Nevertheless, weak families may continue with their organization. Adults may save for old age consumption and pay the higher cost when they need to provide resources to the elderly. Alternatively, for low rate of return, they may choose not to save and to rely on their kids for subsistence level of old age consumption. However, if the transaction cost is large (relatively to the inefficiency

of the pension system), the adults' preferences over a pension system, which has become a better substitute for private family transfers, may change and pensions be supported.

The next proposition summarizes the economic decisions taken in a weak family during the "new regime", and the collective decision over the pension system.

Proposition 4 *In presence of transaction costs in providing resources to the elderly and of property rights of the elderly (the "new regime"), the following equilibria may arise:*

- *If* $R < \frac{\delta\rho}{1-\theta-\delta(1+\phi)}$, *a weak family features no savings,* $s_t = 0$. *Adults support the introduction of a pension system* $P_t = \tau_t y\,(1-\varepsilon)$, *with* $\tau_t = \frac{\delta}{1-\varepsilon}$, *if and only if* $\phi > \frac{\varepsilon}{1-\varepsilon}$.
- *If* $R > \frac{\delta\rho}{1-\theta-\delta(1+\phi)}$, *a weak family features positive savings,* $s_t > 0$. *Adults support the introduction of a pension system* $P_t = \tau_t y\,(1-\varepsilon)$, *with* $\tau_t = \frac{\delta}{1-\varepsilon}$, *if and only if* $\phi > \frac{\varepsilon}{1-\varepsilon} - \frac{\rho}{1+R}$.

As before, for low values of the return rate R, the adults choose not to save, since savings will not provide enough resources in old age. They may thus have to bear the higher transaction cost of providing resources to the elderly. Alternatively, if this cost is high and/or the pension system is sufficiently efficient, i.e., if $\phi\,(1-\varepsilon) > \varepsilon$, they will delegate the support of the elderly to a pension system.

For high values of the return rate R, the adults may prefer to remain at subsistence consumption, and to keep at this level their family members, but to save to increase their old age consumption. However, if the transaction cost is high and/or the pension system is not very inefficient, i.e., if $\phi > \frac{\varepsilon}{1-\varepsilon} - \frac{\rho}{1+R}$, they may choose to delegate even this minimal support of the elderly to a pension system. In both cases, the public pension system will completely resemble the subsistence level family transfer as $P_t = \tau_t y\,(1-\varepsilon) = \delta y$.

The analysis of the family organization in the "old" and "new" regime for the strong and weak families provides interesting insights. Not surprisingly, adults living in weak families are more likely to save, due mainly to the better property rights that they enjoy on their savings in old age. In both cases, no pension system emerges under the "old" regime. Pension schemes may instead be introduced under the "new" regime, in both family structure, due to the increased cost of looking after the elderly. Figure 1 summarizes the results for the new regime. For a given family type, pensions are more likely to emerge when adults choose to save for their old age consumption, thereby suggesting that pensions represent a good alternative to private savings. When comparing across family types, figure 1 shows that, for a given saving behavior, pensions are more likely to be introduced in

weak families, but they are less generous. This is because in strong families, adults have a moral obligation to ensure a (large) share, γ, of their income to the elderly, whereas in countries with weak families the adults' obligations are limited to the subsistence level (δ).

3 Historical perspectives on family ties and pension system design

3.1 Family types

Characterizing the internal organization of the family, the relations between parents and children, among children and between the family and the society at large, represents a difficult task. A recent literature (see Alesina and Giuliano, 2007) has used survey data on individual responses to questions on the relevance of the family, on the time spent with relatives, and on living arrangements to provide a quantitative measure of these family ties. Yet, while current relations within and across families are certainly shaped by cultural factors, they are also largely influenced by the incentives provided by economic and legal institutions, such as labor market regulations, tax code and the welfare state. To be able to study the primal effect of the family organization on the initial design of the welfare state, we thus need to use measurements of the family organization dating back to periods prior to the introduction of welfare state policies. A historical classification of family ties is in Todd (1983), who used historical monographs sometimes dating back more than 500 years, to compile a geographical mapping of family ties. We consider four family types (see figure 2):

- *Absolute nuclear families* are characterized by (i) non-cohabitation between parents and adult children (children typically leave their family after their adolescence, form their own family and become independent); (ii) lack of stringent inheritance rules; and (iii) exogamous marriage relationships. These families nurture individualism. Every person is independent, and has to rely mainly on his/her own effort. This clearly implies total independency of children from their parents, and viceversa. The choice of taking care of old-age parents becomes a subjective decision, rather than a generalized, codified value. As parents have no obligation to support their adult children, kids may in turn also choose whether to take care of old parents or not, and to what extent. Anglo-Saxon countries, Holland and Denmark belong to this group;

- *Egalitarian nuclear families* feature (i) no cohabitation of parents and adult children, (ii) exogamy, but (iii) the independence among generations is weaker than in the previous case. In fact, more precise inheritance rules are typically in place, based on the principle

of equality among siblings. This family welfare context favors the emergence of ideologies of "universalism", which recognize the value of equality, often in contrast to individualism. Egalitarian families encourage the persistence of stronger relations between parents and children. Moreover, to the extent that parents have a (moral or legal) obligation not to favour a kid over the others in their inheritance decisions, all children become equally responsible for their old-age. Mediterranean countries (France, Italy, Spain, Greece), Portugal, Romania, Poland, Latin America (apart from Cuba) and Ethiopia are in this group;

- *Stem or authoritarian families* are based on cohabitation of parents and adult children (sons typically remain in their parents' home and are subject to a vertical hierarchical structure). Rules and social norms are strongly transmitted from one generation to the other. This strengthens family ties. However, the principle of equality is typically not recognized in inheritance rules. Germany, Austria, Sweden, Norway, Czech Republic, Belgium, Luxembourg, Scotland, Ireland, Japan, Korea, Israel and Gitans populations are characterized by this family structure;

- *Communitarian families* are also based on cohabitation, but they affirm equality among siblings in inheritance rules, which reduces individualism and reinforces family ties. This system was in place in Russia, Yugoslavia, Slovak, Bulgaria, Finland, Hungary, Albania, Baltic republics, Centre of Italy, China, Vietnam, Cuba, Indonesia and India.

Todd historical classification of family types is simple, but, at the same time, it captures those aspects of the intergenerational family organization that are crucial to understand the different incentives for the early design of the pension systems. In communitarian and, to a lesser extent, in egalitarian nuclear families, children have a strong moral (or even legal) obligation to support their parents in old age, while this feature is somewhat less present in authoritarian families and almost absent in absolute nuclear families. To relate this historical classification to the current literature on family culture, we compare it to the analysis of family ties in Alesina and Giuliano (2007). They use three individual questions from the World Value Survey: (i) How family is important in life? the answer ranging from 1, "very important", to 4, "not at all important"; (ii) Choose between A (corresponding to the score of 0): "Regardless of what the qualities and faults of one's parents are, one must always love and respect them" and B (score equals 1): "One does not have the duty to respect and love parents who have not earned it by their behavior and attitudes"; (iii) Choose between A (score equals 0) "Parents' duty is to do their best for their children even at the expense of their own well-being" and B (score equals 1) "Parents have a life of their own and should not be asked to sacrifice their own well-being

for the sake of their children". To compare their current measures of family ties based on these questions with Todd historical classification we estimate the following simple model:

$$y_i = \alpha + \beta_1 X_i + \beta_2 COMMUNITY + \beta_3 AUTHORITARIAN + \beta_4 EGALNUCLEAR + \varepsilon_i$$

where y_i is the score attributed to the answer that individual i gives to each of the three questions (respectively in column 1,2 and 3), X_i is a set of individual controls (age, age squared, income, education, political views) and absolute nuclear families is the excluded category of family types. Table 1 shows the correlation between Todd (1983) and Alesina and Giuliano (2007) classifications. Todd classification plays no role in explaining current responses on the importance of the family (column 1). However, stronger (current) kid-to-parents links (see column 2) are associated with egalitarian nuclear and communitarian families as compared to absolute nuclear families. Finally, column 3 describes the downward vertical ties from parents to kids, where authoritarian and communitarian families are characterized by the prominent role of the parents.

3.2 The design of pension systems

In the western world, public pension systems were initially introduced between the end of the XIX century and the end of World War II. Besides their financing method - PAYG, FF or mixed- ever since their introduction, pension systems have largely differed in their design, generosity and coverage. The two polar cases are represented by the so-called Bismarckian and the Beveridgean systems[4]. A Bismarckian scheme covers all the workers, who have contributed to the system throughout their working life, and provides them with a pension benefit that is strictly related to these contributions, and typically replaces a large share of the workers' previous wage. The replacement rates, i.e., the ratio of post-retirement pension benefits to pre-retirement earnings, are thus approximately constant across individuals of different incomes, and the system entails no intragenerational redistribution. Beveridgean systems have instead more universal coverage; they still base their financing on social security contributions, but typically the pension benefit do not replace a large share of the worker's previous wage. In fact, in Beveridgean systems, contributions are proportional to earnings but benefits are almost flat. As such, they mainly constitute a safety net that ensures enough retirement income to low-income workers to cover their

[4]The names "Bismarckian" and "Beveridgean" date back to the origin of the social security system in Germany and to the alternative system proposed after some decades by the Beveridge report in the United Kingdom respectively. In the first social security system, created in Germany by Bismarck in 1881, benefits were earning-related. The Beveridge report, published in 1942 in the UK, introduced the alternative idea of a *minimum* system, i.e., a system with flat-rate benefits for qualified retirees.

pensions wage, while providing a low replacement of their pensions wage to middle and high income workers; thus, intragenerational redistribution is large.

To measure the design of the pension system, we thus consider the evolution of the replacement rates across individuals of different income groups. Large differences in the replacement rates – with high values for low-income individuals and viceversa – identify pension systems that only act as a safety net, and should thus be associated with small family ties; and viceversa for constant replacement rates. As discussed in the next section, we only have current measures of the replacement rates – namely around the year 2000. Hence, for some countries, such as Germany, more than hundred years have passed since the initial design of the pension systems. Fortunately, this design has been rather persistent over time. In fact, while the size of pensions changes rapidly over years, depending on the economic and political circumstances (see Galasso, 2006), the redistributive design has been proved to be much more stable. For instance, the United Kingdom is still an example of a flat-rate pension system, while Germany, Italy and France have remained earnings-related. For a sample of 20 OECD countries, Krieger and Traub (2008) find no significant evidence of a change in the intragenerational redistribution in PAYG systems. Some examples suggest that each scheme is even accentuating its original design: Bismarckian systems are becoming more Bismarckian and analogously for Beveridgean schemes. Italy, for instance, has implemented reforms which have accentuated the earning-related design, by shifting from a defined benefit formula of calculating pensions to a notional defined contribution one, which implies a full link of contributions and benefits, thus entailing almost no intragenerational redistribution. On the opposite, in the last few years the UK program has become even more redistributive: rich individuals may 'contract out' of the public system and enjoy a reduction of the contribution rate, while the State Second Pension (S2P) scheme introduced in 2002 implies a particular attention to the level of pension that represents a safety net.

3.3 Alternative determinants of pension design

Our simple model at section 2 highlights the existence of a transmission mechanism from pre-existing family organizations to the original design of pension systems. Pension systems were introduced to provide old-age support, which was previously provided within the family, and they were designed to mirror the same organization that was prevailing within the family. Hence, where families characterized by weak ties among generations and strong independence within the family, such as Todd absolute nuclear families, prevail, pension systems provide only a basic safety net, but they are not compelled to ensure a

complete provision of the elderly retirement income.

Besides family organizations, there may be alternative determinants of the origins and main features of the welfare state, and alternative mechanisms of transmission from pre-existing contexts to the welfare state. The literature has so far focused on the role of religion, democratization, urbanization and legal origins. Flora (1983, 1987) argues that the welfare state was born under the process of secularization, i.e. the decline of religion on human conduct, and the influence of Protestantism. When religion institutions lost their dominance over society and in non-religious roles, and people reduced their religious practices and beliefs, the state replaced the church in the "public" spheres. Protestantism favored the development of the welfare state, in opposition to Catholicism since the former encouraged the mobilization of lower income levels into mass politics and reduced the power of the church into the public sphere, while the latter continued to be dominated by the conflict between state and church.[5] This contrast between the Protestant and the Catholic countries helps also to explain the differences in timing and quality (such as the level of centralization and the degree of state intervention) of the welfare states.[6] Since the diffusion of religion has proved very persistent, this original effect may continue to shape current welfare state systems.

Democratization may represent an alternative mechanism. According to the modernization theory (Lipset, 1959), the introduction of the welfare state was due to the growing needs for social policy, social and economic equality and security, created by the industrialization. In urban, richer societies, the demand for welfare state increases. Moreover, the process of economic modernization promotes also the foundation and the consolidation of democracies.[7] In democracies, poor individuals take part in politics and, as a consequence, policies favouring these individuals and promoting equality, such as redistributive policies and welfare state emerge (Acemoglu and Robinson, 2006; Boix, 2003). Thus, democratic

[5] The relation between religion and in general socio-economic transformations was first identified by Weber (1905), who linked the Protestant Reform to the modern capitalism. Guiso et al (2003) find that religious beliefs, especially Christian religions, are associated with growth enhancing economic reforms. See also McCleary and Barro (2006).

[6] Recently, van Kersbergen and Manow (2009) reconsider the role of Protestantism, and show that Reformed Protestantism substantially delayed and restricted modern social policy, while the Lutheran state churches positively contributed to the introduction of social protection programs. They also argue that the interaction between religion and electoral rules produced the different political class coalitions sustaining different welfare regimes.

[7] Notice that the interaction between modernization and democratization is a two-way relation and it is difficult to know the correct direction of causality: economic development favors democracy, but also stable democracies would entail economic growth.

countries tend to have larger welfare states.

Legal origins may also shape the pre-existing context in which pension systems were introduced. According to La Porta et al (1997) legal origins are a good proxy for financial development. As argued by Pinotti (2009) more financial development implies less PAYG social security and viceversa, thus establishing a causal relationship from pre-existing legal origins and the size and features of the pension system (see also Perotti and Schwienbacher, 2007).

Finally, as argued by Persson and Tabellini (2004), the size of old age security may also depend on electoral rules (majoritarian/proportional) and forms of government (presidential/parliamentary). In particular, presidential regimes tend to induce smaller public sectors, while proportional elections lead to higher, but less targeted government spending, and to larger budget deficits.

In the next section, we will test the validity of the transmission mechanism running from family types to pension's design compared to these alternative channels.

4 The Empirical Analysis

4.1 Empirical strategy

We aim to test the effect of the pre-existing family organization, in particular its vertical kids-to-parents transfer structure, on the initial design of pension systems around the world. To characterize the different family organizations, we consider Todd classification described at section 3.1 for a set of 85 countries, as shown at figure 2. We use different measures to identify the initial design of the pension system. Since Bismarckian systems provided high replacement rates that are constant across income groups, while in Beveridgean systems the replacement rates vary widely across income, we identify the design of the pension scheme with the ratio between replacement rates (the ratio of post-retirement pension benefits to pre-retirement earnings) at different levels of income. Higher ratios imply different provision of pension to different retirees, relative to their previous wage income, and are consistent with a safety net being provided to low-income, and little replacement being given to the others. We also use a direct measure of the current replacement rate for an individual with the average wage in the economy. Higher replacements of his income are associated with more generous pension for the retiree, and thus indicate that the system provides more than just a safety net. Pension coverage, defined as the share of population between 15 and 64 years old that is covered by the pension system, captures the diffusion of the system among the population. A system

providing only a safety net should have more coverage, and yet being associated to lower spending. Pension expenditure as a percentage of GDP is also considered as a dependent variable. For these pension variables, we consider their available data around the year 2000. While the redistributive design of the pension systems has been rather stable since their introduction, and thus these recent values may be a good proxy for the initial design, current coverage and pension spending will largely be determined by current demographic, economic and political processes.

We estimate a simple cross country model:

$$\begin{aligned} y_i &= \alpha + \beta_1 COMMUNITY + \beta_2 AUTHORITARIAN + \beta_3 EGALNUCLEAR + \\ &\quad \beta_4 OECD + \beta_5 LAAM + \beta_6 AFRICA + \beta_7 X_i + \varepsilon_i \end{aligned}$$

where y_i is our dependent variable measuring the redistributive design of the pension scheme (or the size of pension) in country i; $COMMUNITY$ is a dummy variable equal to 1 if country i features a communitarian family and 0 otherwise; $AUTHORITARIAN$ a dummy variable equal to 1 if country i has an autoritharian family and 0 otherwise; $EGALNUCLEAR$ a dummy variable equal to 1 if country i there has an egalitarian nuclear family and 0 otherwise; $OECD, LAAM$ and $AFRICA$ are geographical dummy variables equal to 1 if country i belongs respectively to OECD, Latin America and Africa and 0 otherwise; X_i is a set of control variables, which include alternative legal, cultural, political, economic and demographic determinants that could have affected the design and the size of the system, and ε_i is the error term. The absolute nuclear family type is thus the omitted one and our reference family type.

For our dependent variables y_i we use different measures of design and size of the pensions: (i) the ratio between the replacement rates of a worker earning one-half of the average income and the one of a worker earning exactly the average income (repl50_1); (ii) the ratio between the replacement rate of a worker earning the 75% of the average income and the one of a worker earning 150% of the average income (repl75_150); (iii) the replacement rate of a worker earning the average income (replacem1); (iv) the pension coverage, i.e. the share of population between 15 and 64 years old that is covered by the pension system, and (v) the pension expenditure as a percentage of GDP.

Figures 3 and 4 show the distribution of our main measures of pensions design, (repl50_1) and (repl75_150) around the world, suggesting that they vary widely across geographic areas.

Due to the small number of observations, we run different sets of regressions including one of the following control variables, X, at a time: legal origins, religion, level of urbanization, level of democracy, GDP and the share of elderly.

Our unit of analysis is a country, since pension design varies at country level but is homogeneous within country. Furthermore, since this design displays a strong persistence and we are considering the historical family determinants of the current pension, we abstract from the time component and rely on a cross-country analysis. Data availability limits the number of observations to 55 when we use the replacement rates (repl50_1) and to 78 when we measure the size of pension.

Data sources are described in the appendix, including the list. Summary statistics are at table 2.

4.2 Results

Table 3 presents our baseline specification: we regress our measures of the design and size of pensions on the three types of pre-existing family structures and on the geographical dummies. Communitarian and egalitarian nuclear families are less redistributive than absolute nuclear ones for our two measures of the replacement ratio. Using our second measure, also authoritarian families are less redistributive than absolute nuclear. This result is in line with the idea that absolute nuclear families capture weak and independent relations between parents and children in the family, which lead to the design of a pension system that resembles a safety net. In families that prize independence, and do not tie the parents' hands to equal inheritance rules, children do not perceive an obligation to provide old-age support to their parents, unless perhaps they are in strong need of help. This idea translates into pensions: individuals only expect to receive from the state a safety net. When instead children took good care of their elderly parents, the state has to provide a sufficient pension to replace the individual previous wage income, not just a safety net. This idea is supported by the level of the replacement rate being positively related to the strength of the family ties: all other family types enjoy a higher replacement than countries with absolute nuclear families, indicating that they provide more than a safety net.

When we turn to the size of pension, as expected, absolute nuclear families are associated with a higher coverage, while current pension spending is instead unrelated to the types of families.

We now enrich our baseline scenario by introducing additional variables to test for alternative channels to explain the original design of pension systems, or which may influence both the design of pensions and the family values. We first introduce legal origins, which, following La Porta et al. (1997) are classified as Anglo-Saxon, Socialist, Germany and French. Figure 5 shows the distribution of these indicators across the world. By

comparing figure 2 and 5 we do not see a clear association between the family types and the origin of the legal system, suggesting that family ties are capturing some inherent values different from what is expressed by the origin of the legal system. This is confirmed in table 4, where we include the four dummy variables referring to legal origins in our baseline specification. When compared to communitarian and egalitarian nuclear families, absolute nuclear families remain associated with less earnings-related schemes and larger coverage. Communitarian families have also a higher replacement rate. The Anglo-Saxon legal origin is associated with less coverage and less pension spending, but it does not seem to affect the design.[8]

We then turn to religion, which has also been considered a crucial and persistent determinant of economic and social outcomes (see section 2.3). We hence need to control whether religion, rather than the principles underlying family types, is the real responsible for different pension design across countries. Figure 6 suggests that the diffusion of the main religions, Catholic, Orthodox, Protestant, Islamic, around the world in 1900 is not directly associated with the design of pensions. Redistributive pensions are present in many Protestant countries, but also in the catholic Argentina and Ireland. In table 5, we control for the relative share of the four religions in the different countries in 1900 (i.e., at the period around or before the introduction of the pension systems). We find that absolute nuclear family are again associated with more redistributive pension schemes than the other types of families, while religion seems to have no effect on the design of pensions,[9] but to be associated with small pension expenditure and coverage in countries with a large share of Muslims. Similarly, in table 6, an Herfindal index of religious homogeneity is not significantly associated with the design, while the types of family (absolute nuclear family as opposed to the others) remain crucial.

In table 7, we include a measure of the level of urbanization of the country at the beginning of the XX century. While this variable turns out to be associated with the size of the pensions system in the obvious direction (more urbanization implies more pensions), it is not significant to explain their design. The types of family instead remain significant.

In table 8, we introduce an indicator of the political environment in the different countries in 1900. Do the design of system or their size depend on whether countries were more democratic at the time of the introduction of the system? A higher level of

[8] This result is in line with the idea that private pensions may be substitute for public pensions when financial markets are well developed, which is in turn associated with English legal origin.

[9] Unfortunately, the CIA factbook reports observations only for 49 countries, among those for which we have the pension data. The coefficient of the family types are less precisely estimated, but point estimates are in line with the estimates in the previous tables.

democratization, as captured by the Polity2 indicator[10] has no impact on the design of pensions; as usual, having an absolute nuclear family organization implies a significantly different design than any other family type, namely a higher redistributive component.

In table 9, we control for current economic and demographic variables, that is, the level of GDP and the share of elderly in the population. Richer countries have higher coverage, while more elderly are associated with both higher coverage and more pension spending.[11] Current income and aging however do not explain the design of pensions. The type of family remains significant in all specifications in the usual way.

Finally, in table 10, we control for the electoral rule and form of government. As expected, countries with majoritarian systems have lower coverage and level of pension and lower replacement rates than countries with proportional systems. However, having a majoritarian or presidential electoral rule has no effect on the redistributive design of pensions, while family types continue to show the same relationships found so far. The form of government, presidential versus parliamentary, turns out to play no role. Unfortunately, observations are drastically reduced due to data availability.

To sum up, we have found that the family organization plays a crucial role as primal determinant of the design of pension systems since their introduction. Instead, legal origin and religion, which have been extensively suggested to determine other socioeconomic outcomes, play no role in this case. Similarly, other determinants of the context in which pensions were introduced, such as the level of urbanization or democratization of the country at that time, or current variables such as current GDP and the share of elderly in the population, have also little to say about the design of pensions. Interestingly, some of these variables turn out to be related to current features such as the size or the coverage of the pensions, but not to old, persistent characteristics, such as the design. A family organization based on absolute nuclear families represents the better correspondence to the design of redistributive pension systems.

5 Conclusions

We have identified the types of family relationships as the ultimate cause of the design of pension systems and contribute to rationalize its persistence over time. Why family? Following Todd (1983), family does not depend on climate conditions, geological features,

[10] This indicator is widely used in both the economic and political science literature on democracy. For details, see the appendix.

[11] There is a large literature on the link between aging and the size of social security (see Galasso and Profeta, 2004, Disney, 2007).

economic environment. It is impossible to associate it with geographic territories. The system of latent values embedded in the family has no link with religion or language. There is nothing pre-determined to the family relationships. In a world, behind the family there is only the "hazard".

We have found that absolute nuclear families, where the relations between parents and children are weak, leads to the emergence of a pension system with flat benefit formulas and more redistribution across income levels, as compared with the other types of families, in particular communitarian and egalitarian nuclear. The link between the type of families and the design of pension systems is robust to the introduction of other historical pre-existing conditions, such as legal origin, religion, urbanization, democratization.

Besides having a strong historical component, our analysis may shed some light on the feasibility of today's pension reforms, by explaining how individuals' behavior as shaped by cultural/institutional elements influences the peacemakers decision on which institution (e.g., pension system) to choose, how to design it (namely, earnings-related versus flat-rate) and how to implement the policy. This is a promising direction for future research.

Technical Appendix

.1 Proof of Proposition 1

Suppose first that there are no pensions. In the old regime with strong family ties, if the adults do not save, they divide their resources (income and previous savings, if any) between their own consumption and consumption of the old:

$$y + s_{t-1}(1+R) = c_t^A + c_t^o$$

Since adults have to provide the elderly with at least $c_t^o = \gamma y$ (see Eq.4) we can write the consumption of the adults as follows:

$$y(1-\gamma) + s_{t-1}(1+R) = c_t^A$$

If instead the adults decide to save, we have:

$$y(1-\gamma) + s_{t-1}(1+R) - s_t = c_t^A$$

Since individuals have no property rights on their savings, when old, they will receive a transfer γy from the next adults' generation, so that their old age consumption is always $c_{t+1}^o = \gamma y$. It is straightforward to see that their utility decreases with savings, and thus the adults choose not to save.

Suppose now that the adults have to decide upon the introduction of the pension system. The utility becomes

$$U\left(s_t = 0, P_t > 0\right) = y(1-\varepsilon\tau_t) + s_{t-1}(1+R)$$

since $P_t = y\tau_t(1-\varepsilon)$, which is clearly decreasing in τ (for $\varepsilon > 0$) so that the adults will decide not to introduce pensions ($\tau_t = 0$).

.2 Proof of proposition 2

In weak family ties the old have property rights and $c_t^o \geq \delta y$. We consider separately the cases in which initial savings are zero, i.e. $s_{t-1} = 0$ or positive $s_{t-1} > 0$.

Suppose first that $s_{t-1} = 0$. In absence of pensions, if the adults decide not to save, they divide income between their own consumption and the subsistence consumption of the old, $c_t^o = \delta y$. Hence, $c_t^A = y(1-\delta)$. Since, with no savings, old age consumption is $c_{t+1}^o = \delta y$, the utility function for an adult who decides not to save is equal to:

$$U(s_t = 0, P_t = 0) = c_t^A + c_{t+1}^o = y \tag{5}$$

If instead the adults save, they keep their consumption in adult age at the minimum level, $c_t^A = \theta y$, provide the elderly with the minimum amount of transfer, $c_t^o = \delta y$, and save their remaining income $s_t = y(1 - \delta - \theta)$. Their old age consumption depends on their savings in the good state, and on the family transfer when have no enough resources: $c_{t+1}^o = (1 + R)s_t + (1 - \rho)\delta y$ with a corresponding utility of:

$$U\left(s_t > 0, P_t = 0\right) = c_t^A + c_{t+1}^o = \theta y + (1 + R)y(1 - \delta - \theta) + (1 - \rho)\delta y \tag{6}$$

A simple comparison of the utilities at Eq. 5 and Eq. 6 shows that the utility with no savings is larger for $R < \frac{\delta\rho}{1-\delta-\theta}$, and viceversa.

If pensions were introduced, the utility function of a non-saver adult becomes:

$$U\left(s_t = 0, P_t > 0\right) = y(1 - \tau_t) + P_t = y(1 - \varepsilon\tau_t) \tag{7}$$

which is decreasing in τ, and lower than the utility with no pension, $U\left(s_t = 0, P_t = 0\right) = y$. Hence, non-saver adults do not support pensions.

Consider now the case of positive past savings, i.e. $s_{t-1} > 0$. The adults have to provide the old with the minimum level of consumption δy only in the case of a low rate of return (with probability $1 - \rho$). If they decide not to save, their consumption in adult age is equal to $c_t^A = y\left[1 - \delta(1 - \rho)\right]$, while in old age they still get $c_{t+1}^o = \delta y$. Thus, the utility of a young individual who decides not to save is equal to

$$U\left(s_t = 0, P_t = 0\right) = c_t^A + c_{t+1}^o = y(1 + \delta\rho) \tag{8}$$

If instead the adults decide to save, they keep their consumption in adult age at the minimum level, $c_t^A = \theta y$; they provide the elderly with the minimum amount of transfer, $c_t^o = \delta y$, but only in case of low rate of return; and they save their remaining income $s_t = y\left[1 - \delta(1 - \rho) - \theta\right]$. Their old age consumption will depend on their savings in the good state, and on the family transfer in the bad state $c_{t+1}^o = (1 + R)s_t + (1 - \rho)\delta y$, and the utility will be:

$$U\left(s_t > 0, P_t = 0\right) = c_t^A + c_{t+1}^o = \theta y + (1 + R)y\left[1 - \delta(1 - \rho) - \theta\right] + (1 - \rho)\delta y \tag{9}$$

Comparing eq. 5 and eq. 6, it is easy to see that if $R > \frac{\delta\rho}{1-\delta(1-\rho)-\theta}$ the adults decide to save. Notice that, since $\frac{\delta\rho}{1-\delta(1-\rho)-\theta} < \frac{\delta\rho}{1-\delta-\theta}$, the threshold found in case of zero past savings applies, and we have that savings are positive if $R > \frac{\delta\rho}{1-\delta-\theta}$.

To show that pensions will not be introduced by savers, notice that in this case savings would be equal to $s_t = y(1-\theta-\tau_t)$. Using simple algebra, the utility of an adult becomes:

$$U\left(s_t > 0, P_t > 0\right) = \theta y + y(1 - \frac{\delta}{1 - \varepsilon} - \theta)(1 + R) + (1 - \rho)\delta y$$

It is easy to see that the above utility is lower than the one obtained at Eq. 9 in absence of pensions; and thus adults choose zero pensions.

.3 Proof of proposition 3

To examine the choices of a strong family under the "new regime", consider first that past savings are equal to zero, $s_{t-1} = 0$, and there are no pensions. If an adult decides not to save, his utility is:

$$U\left(s_t = 0, P_t = 0\right) = c_t^A + c_{t+1}^o = y\left[1 - \gamma(1+\phi)\right] + \gamma y = y(1 - \gamma\phi)$$

If the adult decides to save, his adult consumption is kept at subsistence level $c_t^A = \theta y$ and savings are $s_t = y\left[1 - \theta - \gamma(1+\phi)\right]$. Since, in this new regime, adults have property rights on their savings, but still receive a family transfer when old in the bad state, the utility of an adult who decides to save is

$$U\left(s_t > 0, P_t = 0\right) = \theta y + y\left[1 - \theta - \gamma(1+\phi)\right](1+R) + (1-\rho)\gamma y$$

Comparing the two levels of utility in case of zero and positive savings, it is easy to see that zero savings is a preferred choice if $R < \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)}$ and viceversa.

With pensions, the utility of a non-saver adult becomes:

$$U\left(s_t = 0, P_t > 0\right) = y(1 - \tau_t) + P_t = y(1 - \varepsilon\tau_t). \tag{10}$$

Since $\frac{\partial U}{\partial \tau_t} < 0$, the adults will at most decide to keep τ at its minimum level needed to ensure the subsistence consumption to the elderly, $P_t = (1-\varepsilon)\tau_t y = \gamma y$, and thus $\tau_t = \gamma/\left(1-\varepsilon\right)$ and

$$U\left(s_t = 0, P_t > 0\right) = y(1 - \frac{\gamma\varepsilon}{1-\varepsilon}). \tag{11}$$

For $\phi > \frac{\varepsilon}{1-\varepsilon}$, this utility is larger than the utility reached in case of zero pension.

Suppose now that past savings were positive, $s_{t-1} > 0$, and thus the adults have to provide a transfer γy to the elderly only in the bad state. If the adult decides not to save, his utility given by adult and old age consumption is

$$U\left(s_t = 0, P_t = 0\right) = c_t^A + c_{t+1}^o = y\left[1 - \gamma\phi(1-\rho) + \gamma\rho\right]$$

If instead he decides to save, we have

$$c_t^A = \theta y$$

$$s_t = y\left[1 - \theta - \gamma(1+\phi)(1-\rho)\right]$$

$$c_{t+1}^{o} = (1+R)s_t + (1-\rho)\gamma y$$

$$U\left(s_t > 0, P_t = 0\right) = \theta y + y\left[1-\theta-\gamma(1+\phi)(1-\rho)\right](1+R) + (1-\rho)\gamma y$$

Thus, the adult decides to save if $R > \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)(1-\rho)}$ and viceversa. Since $\frac{\rho\gamma}{1-\theta-\gamma(1+\phi)(1-\rho)} < \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)}$, the threshold found in case of zero past savings applies, and thus savings are positive if $R > \frac{\rho\gamma}{1-\theta-\gamma(1+\phi)}$.

With savings and positive pensions, we would have the following adult consumption, $c_t^A = \theta y$, savings, $s_t = y\left[1-\theta-\tau_t\right]$, and old age consumption $c_{t+1}^{o} = (1+R)s_t + P_t$. Again, since $\frac{\partial U}{\partial \tau_t} < 0$, pensions would be kept at their minimum level needed to guarantee the subsistence consumption to the old in the bad state, that is, $P = \tau y(1-\varepsilon) = \gamma y$, with $\tau = \gamma/\left(1-\varepsilon\right)$. Thus, the utility with pensions and savings would be:

$$U\left(s_t > 0, P_t > 0\right) = \theta y + y\left[1-\theta-\tau\right](1+R) + \tau(1-\varepsilon)y$$

which is larger than the utility in case of zero and positive pensions, if $\phi > \frac{\varepsilon}{1-\varepsilon} - \frac{\rho}{1+R}$.

.4 Proof of proposition 4

It follows from the same steps as proposition 3 but with $c_{t+1}^{o} = \delta y$ instead of $c_{t+1}^{o} = \gamma y$.

A Data appendix

We here describe the variables used in the empirical analysis and their sources.

- Replacement rates of the pension system at 50%, 75%, 100% and 150% of average labor income are built on Whitehouse (2007) "Pension Panorama" The World Bank and OECD (2009) "Pension at a Glance. Special Edition: Asia/Pacific. From these data we calculate repl50_1: the ratio between the replacement rate of a worker earning one-half of the average income and the one of a worker earning exactly the average income; repl75_150: the ratio between the replacement rate of a worker earning the 75% of the average income and the one of a worker earning 150% of the average income and replacem1: the replacement rate of a worker earning the average income. Data on repl75_150 are available for the following countries: Algeria, Argentina, Australia, Austria, Bahrain, Belgium, Bulgaria, Canada, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, El Salvador, Estonia, Finland, France, Germany, Greece, Hungary , Iran, Ireland, Italy,

Japan, Jordan, Latvia, Libya, Lithuania, Luxembourg, Mexico, Morocco, Netherlands, New Zealand, Norway, Peru, Poland, Portugal, Slovak Republic, South Korea, Spain, Sweden, Tunisia, Turkey, United Kingdom, United States, Uruguay, Yemen. Data on replacemen1 and repl50_1 include also China, India, Indonesia, Pakistan, Vietnam.

- Coverage1564 is the share of population between 15 and 64 years old that is covered by the pension system. It is constructed as the mean of different observations over time. Source: World Bank (2007). HDNSP pension database. With respect to the previous variable, the sample includes some additional countries, Afghanistan, Albania, Bangladesh, Bolivia, Brazil, Dominica, Ecuador, Jamaica, Kazakhstan, Kyrgyzstan, Lebanon, Nicaragua, Paraguay, Syria, Venezuela, Yugoslavia, but excludes Bulgaria, Dominican Republic, New Zealand.

- Pengdp_91_2006: this variable indicates how much pensions count as a share of GDP. The data were collected in different time periods, in particular between 1991 and 2006. However most of them come from a period around the 2000. Source: World Bank (2007), HDNSP pension database. The sample includes the same countries as coverage 1564 with the addition of Azerbaijan, Belize, Cuba, Dominican Republic, Ethiopia, Guatemala, Honduras, Israel, Kuwait, New Zealand, Panama, Russia, Slovenia, Trinidad & Tobago, Turkmenistan, Uzbekistan and the exclusion of Bahrain, Dominica, India, Indonesia, Kazakhstan, South Korea.

- Family types variables:

  - AbsoluteEgal: this variable is equal to one if the family is absolute nuclear and zero otherwise. Source: Todd (1983).

  - Community: this variable is equal to one if the family is communitarian and zero otherwise. Source: Todd (1983).

  - Authoritarian: this variable is equal to zero if there are authoritarian families and zero otherwise. Source: Todd (1983).

  - Egal Nuclear: this variable is equal to zero if there are egalitarian nuclear families and zero otherwise. Source: Todd (1983).

- Legal origins variables: the origin of the legal system in a country is indicated by a set of dummy variables l_eng l_soc l_ger l_fra. Each dummy is equal to one if the country has the particular legal origin of interest and zero otherwise. In general

we do not have overlapping among the dummies. More precisely: l_eng refers to an Anglo-Saxon legal origin; l_soc refers to a socialist legal origin; l_ger to a Germany legal origin; l_fra to a French legal origin. Source: La Porta et al. (1998).

- Religion variables:

  - Cath1900, Orth1900, Prot1900, Mus1900 contain the percentage in 1900 over the entire population of Catholic, Orthodox, Protestant and Muslin people respectively. Source: CIA factbook.

  - Herfrel1900: this variable is a proxy for the level of religious heterogeneity is a country in 1900. It has been constructed computing the Hirschman-Herfindahl index using the religion data. In particular we have data on the following religions: catholic, protestant, orthodox, Muslim, Jewish, Buddhism, East Religions;

- Urban: this variable contains the share of population living in an urban area in the early XX century. Source: World Bank, World Development Indicators (WDI).

- Polity2_1900: This data presents an evaluation of the political situation in the different countries. The ranking goes from -10 (hereditary monarchy) to +10 (consolidated democracy). The score is computed by subtracting the AUTOC score from the DEMOC score, where these indicators are derived from coding of the competitiveness of political participation, the openness and competitiveness of executive recruitment and constraints on the chief executive using different weights. Source: Center of Systemic peace, the Policy IV Project (http://www.systemicpeace.org/polity/polity4.htm). Data refers to the year 1900.

- Lngdppc2000: logarithm of the GDP per capita in the 2000. Source: World Bank, World Development Indicators

- Pop_65_2000: share of people older than 65 years old over the entire population in 2000. Source: World Bank, World Development Indicators

- Geographic dummy variables:

  - Oecd: dummy variable equal to one if the country of interest is an OECD country and zero otherwise;

  - Laam: dummy variable that is equal to one if the country of interest is a Latin America country and zero otherwise;

  - Africa: dummy variable that is equal to one if the country of interest is an African country and zero otherwise;

References

[1] Acemoglu, D., Johnson, S. and Robinson, J.A. (2001) "The colonial origins of comparative development: An empirical investigation", American Economic Review 91(5):1369-1401.

[2] Acemoglu, D. and J. A. Robinson (2006) "Economic Origins of Dictatorship and Democracy", New York: Cambridge University Press.

[3] Alesina, A. and P. Giuliano (2007) "The Power of the Family", NBER Working Paper No.W13051.

[4] Alesina, A., Algan, Y., Cahuc, P. and Giuliano, P. (2010) "Family values and the regulation of labor", NBER Working Paper No. 15747.

[5] Algan, Y. and Cahuc, P. (2007) "The roots of low european employment: Family culture?" NBER Macroeconomic Annual, MIT Press eds J. Frenkel and C. Pissarides.

[6] Banfield, E.C. (1958) "The moral basis of a backward society" Glencoe, III Free Press.

[7] Boix, C. (2003) "Democracy and Redistribution", New York: Cambridge University Press.

[8] Caucutt, E., T. F. Cooley and N. Guner (2007) "The Farm, the City, and the Emergence of Social Security," NBER working paper

[9] Coleman, J.S. (1988) "Social capital in the creation of human capital" American Journal of Sociology (XCIV): S95-S120.

[10] Coleman, J.S. (1990) "Foundations of social theory" Harvard University Press.

[11] Conde Ruiz, J.I. and Profeta, P. (2007) "The Redistributive Design of Social Security Systems" The Economic Journal 117 (April), 686-712.

[12] Cutler, D., Gruber, J., (1996) "Does public insurance crowd out private insurance?" Quarterly Journal of Economics 111 (2), 391–430.

[13] Cutler, D. M., and R. Johnson (2004) "The Birth and Growth of the Social Insurance State: Explaining Old Age and Medical Insurance across Countries," Public Choice 120, pp. 87-121.

[14] Daly, M. (1997) "Welfare states under pressure: cash benefits in European welfare states over the last ten years" Journal of European Social Policy 7:129-146.

[15] Disney, R. and Johnson, P. ed. (2001) Pension Systems and Retirement Incomes across OECD countries, Edward Elgar editor.

[16] Disney, R. (2007). Population ageing and the size of the welfare state: Is there a puzzle to explain? European Journal of Political Economy 23, 542–553.

[17] Esping-Andersen, G. (1999) Social foundations of postindustrial economies, Oxford Economic Press

[18] Duranton, G., Rodriguez_pse, A. and Sandall, R. (2009) "Family Types and the Persistence of Regional Disparities in Europe", Economic Geography 85(1): 23-47.

[19] Fernandez, R. (2007),"Culture and Economics" in The New Palgrave Dictionary of Economics, 2nd Edition

[20] Fernandez, R. and Fogli, A. (2009) "Culture: An empirical investigation of beliefs, work and fertility", American Economic Journal: Macroeconomics, 1,1: 146-177.

[21] Flora, P. (1983) "State, Economy and Society in Western Europe 1815-1975." A data Handbook in two Volumes, London, Macmillan Press.

[22] Flora, P. (ed.) (1987) "Growth to Limits: The Western European Welfare States since World War II" .Volume I and II, Walter De Gruyter.

[23] Galasso, V. (2006), "The Political Future of Social Security in Aging Societies". Cambridge, MA: MIT Press.

[24] Galasso, V. and Profeta, P. (2004) "Lessons for an Aging Society: the Political Sustainability of Social Security Systems", Economic Policy: 63-115.

[25] Galasso, V. Gatti, R. and Profeta, P. (2009) "Investing for the old age: Pensions, children and savings", International Tax and Public Finance 16(4): 538-559.

[26] Goody, J. (2000) "The european family: an historico-anthropological essay", Blackwell.

[27] Guiso, L., Sapienza, P. and Zingales, L. (2003) "People's opium? Religion and economic attitudes" Journal of Monetary Economics 50:225-282.

[28] Guiso, L., Sapienza, P. and Zingales, L. (2006) "Does culture affect economic outcomes", Journal of Economic Perspectives, 20(2):23-48.

[29] Greif, A. (2006), "Institutions and the path to the modern economy: Lessons from medieval trade", Cambridge University Press.

[30] van Kersberger, K. and Manow, P. (2009) "Religion, class coalitions and welfare states", Cambridge University Press.

[31] Koethenburger, M., Poutvaara, P. and Profeta, P. (2008), "Why are more redistributive social security systems smaller?" Oxford Economic Papers 60(2): 275-292.

[32] Krieger, T. and Traub, S. (2008), "Back to Bismarck? Shifting preferences for intragenerational redistribution in OECD pension systems", Center for International Economics W.P. Series

[33] La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny (1997), "Legal Determinants of External Finance", Journal of Finance 52 (3), 1131-1150.

[34] Lewis, J.(1992)."Gender and the development of welfare regimes", Journal of European Social Policy 2(3), 159-173.

[35] Licht, A., Goldschmidt, C. and Scwartz, S.H.(2006) "Culture rules: The foudnations of the rule of law and other norms of governance" William Davidson Institute WP 605

[36] Lindert, Peter H. (1994) "The Rise of Social Spending, 1880-1930", Explorations in Economic History 31, pp. 1-37.

[37] Lipset, S. M. (1959) "Some Social Prerequisites for Democracy: Economic Development and Political Legitimacy", American Political Science Review, 53, 69-105.

[38] McCleary, R. and Barro, R. (2006) "Religion and Economy", Journal of Economic Perspectives 20(2):49-72.

[39] North, D.C. (1990) "Institutions, institutional change and economic performance", Cambridge University Press.

[40] OECD (2005). "Pensions at a Glance. Public policies across OECD countries" OECD.

[41] OECD (2009) "Pension at a Glance". Special Edition: Asia/Pacific, OECD.

[42] Perotti, E., and A. Schwienbacker (2007) "The Political Origin of Pension Funding", mimeo, Amsterdam University.

[43] Persson, T. and Tabellini, G. (2004) "The economic effects of constitutions", MIT Press.

[44] Pfau-Effinger, B. (2005) "Culture and welfare state policies: Reflections on a complex interrelation" Journal of Social Policy 34, 1:3-20.

[45] Pinotti, P. (2009) "Financial Development and Pay-As-You-Go Social Security" Topics in Macroeconomics, Berkeley Electronic Press, vol. 9(1): 1674-1674

[46] Putnam, R. (1993) "Making democracy work". Princeton, NJ: Princeton University Press.

[47] Reher, D. S. (1998) "Family ties in western Europe: Persistent contrasts", Population and Development Review, 24(2), 203-234.

[48] Smith, D. (1996) "Charity, self-interest and welfare: reflections from demographic and family history" in Charity, self-interest and welfare in the English past, ed. by M.Daunton, London UCL Press.

[49] Tabellini, G. (2008) "Institutions and culture", Journal of the European Economic Association Papers and Proceedings, Vol.6(2-3): 255-294..

[50] Tabellini, G. (2009) "Culture and institutions: Economic development in the regions of Europe". Journal of the European Economic Association, forthcoming.

[51] Todd, E. (1983) "La troisième planète", Paris: Seuil.

[52] Todd, E. (1990) "L'invention de l'Europe". Paris: Seuil.

[53] Twigg, J. and Grand, A. (1998) "Contrasting legal conceptions of family obligation and financial reciprocity in the support of older people: France and England", Ageing and Society 18:131-146

[54] Weber, M. (1905) "The protestant ethic and the spirit of capitalism", London:Allen & Unwin.

[55] Whitehouse (2007) "Pension Panorama", World Bank

Table 1: Family ties and family types

VARIABLES	(1) fam_imp	(2) pare_respect	(3) pare_respon
age	-0.00689***	-0.000724	-0.00412***
	(0.000976)	(0.000891)	(0.00106)
agesq	7.74e-05***	-2.91e-06	2.74e-05***
	(1.24e-05)	(1.06e-05)	(1.00e-05)
income	-0.00885***	0.00602***	0.000759
	(0.00220)	(0.00199)	(0.00266)
educ	0.00388	0.00875***	0.0150***
	(0.00234)	(0.00250)	(0.00318)
polviews	0.00303	0.0146***	0.00801**
	(0.00427)	(0.00269)	(0.00350)
community	**0.0392**	**-0.135****	**0.0857*****
	(0.0397)	**(0.0647)**	**(0.0313)**
aut	**0.0187**	**0.0120**	**0.163*****
	(0.0328)	**(0.0883)**	**(0.0486)**
egalnucl	**0.0177**	**-0.142****	**0.0136**
	(0.0354)	**(0.0647)**	**(0.0253)**
Constant	1.259***	0.219***	0.180***
	(0.0411)	(0.0642)	(0.0393)
Observations	101169	94631	89011
R-squared	0.007	0.037	0.028

Table 2: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
community	85	0.4470588	0.50014	0	1
aut	85	0.1294118	0.3376472	0	1
egalnucl	85	0.3411765	0.4769182	0	1
absonucl	85	0.0823529	0.2765332	0	1
africa	85	0.0705882	0.2576559	0	1
asia	85	0.0588235	0.2366905	0	1
laam	85	0.2705882	0.4469003	0	1
oecd	85	0.2823529	0.4528157	0	1
l_eng	85	0.1764706	0.3834825	0	1
l_soc	85	0.2470588	0.4338609	0	1
l_fra	85	0.4823529	0.502654	0	1
l_ger	85	0.0470588	0.2130215	0	1
cath1900	49	0.4662041	0.4243819	0	1
prot1900	49	0.2058776	0.3351906	0	0.992
orth1900	49	0.0683224	0.1434626	0	0.839
mus1900	49	0.189102	0.3724387	0	0.997
herfrel1900	49	0.7779092	0.1950197	0.338706	1
urban	79	63383.54	19569.98	15400	97000
polity2_1900	46	-0.2391304	6.147031	-10	10
pop_65_2000	83	8.96701	5.089319	1.373369	18.23579
lngdppc	82	8.115943	1.393526	4.706893	10.47798
maj	55	0.2363636	0.4287638	0	1
pres	55	0.3818182	0.4903101	0	1

Table 3: Baseline specification

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.470*** **	**-0.512*** **	**29.54*** **	**-31.96*** **	**0.743**
	(0.150)	**(0.120)**	**(10.45)**	**(8.560)**	**(2.267)**
aut	**-0.218**	**-0.237***	**12.81**	**-1.228**	**1.819**
	(0.149)	**(0.139)**	**(8.514)**	**(3.452)**	**(1.444)**
egalnucl	**-0.359** **	**-0.461*** **	**28.50*** **	**-8.203*** **	**2.379**
	(0.162)	**(0.116)**	**(7.285)**	**(2.602)**	**(1.848)**
oecd	-0.0516	-0.0509	10.17	13.18*	4.176**
	(0.0896)	(0.0561)	(9.138)	(7.785)	(2.045)
laam	0.205	0.173	-8.536	-27.69***	-3.114
	(0.172)	(0.116)	(12.97)	(7.115)	(3.145)
africa	-0.104**	-0.00697	14.89	-1.353	-2.718**
	(0.0445)	(0.0354)	(10.05)	(5.787)	(1.087)
Constant	1.564***	1.529***	44.94***	58.53***	4.453*
	(0.153)	(0.122)	(10.53)	(7.820)	(2.311)
Observations	55	50	55	68	78
R-squared	0.314	0.378	0.185	0.661	0.360

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Legal origin

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.348***	**-0.387** **	**17.43***	**-36.96*** **	**-3.094**
	(0.180)	**(0.166)**	**(10.12)**	**(7.908)**	**(2.136)**
aut	**-0.0100**	**-0.0291**	**3.132**	**-7.160**	**-1.034**
	(0.156)	**(0.156)**	**(9.235)**	**(8.077)**	**(1.526)**
egalnucl	**-0.143**	**-0.282***	**9.865**	**-10.13***	**0.332**
	(0.192)	**(0.161)**	**(11.44)**	**(5.277)**	**(1.758)**
l_eng	0.0831	0.197	-10.69	-16.87**	-5.185***
	(0.161)	(0.165)	(8.109)	(7.913)	(1.384)
l_soc	-0.190	0.0239	-0.893	7.020	1.667
	(0.146)	(0.144)	(9.834)	(10.45)	(1.913)
l_ger	-0.329*	-0.213	4.562	-8.339	0.610
	(0.175)	(0.162)	(10.84)	(6.569)	(1.801)
l_fra	-0.193	-0.0607	14.87	-14.46	-2.507**
	(0.127)	(0.121)	(10.38)	(8.994)	(1.246)
oecd	-0.102	-0.0481	4.883	18.29**	4.378*
	(0.120)	(0.103)	(12.41)	(7.116)	(2.290)
laam	0.169	0.189	-14.98	-19.88**	-2.289
	(0.187)	(0.138)	(15.47)	(7.878)	(2.846)
africa	-0.0512	0.0635	1.342	9.558*	-0.533
	(0.0646)	(0.0702)	(17.74)	(5.222)	(1.430)
Constant	1.582***	1.395***	55.74***	67.09***	8.313**
	(0.239)	(0.217)	(16.10)	(10.54)	(3.169)
Observations	55	50	55	68	78
R-squared	0.410	0.465	0.274	0.759	0.529

Table 5: Religion (1)

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.441*** **	**-0.518*** **	**21.36** **	**-7.959***	**1.493**
	(0.154)	**(0.140)**	**(9.763)**	**(4.632)**	**(1.688)**
aut	**-0.230**	**-0.272***	**13.34**	**1.290**	**2.484**
	(0.167)	**(0.158)**	**(8.382)**	**(3.109)**	**(1.543)**
egalnucl	**-0.301**	**-0.515*** **	**25.55** **	**-4.183**	**6.068*** **
	(0.184)	**(0.158)**	**(10.06)**	**(4.161)**	**(1.816)**
oecd	-0.0218	-0.0340	5.801	5.675	0.437
	(0.103)	(0.0709)	(8.630)	(4.024)	(1.522)
laam	0.185	0.182	-9.600	-30.53***	-8.789***
	(0.187)	(0.124)	(13.43)	(5.612)	(1.860)
africa	-0.0804**	0.00311	-6.112	6.929	0.527
	(0.0349)	(0.0369)	(12.83)	(4.947)	(0.999)
cath1900	-0.0822	-0.00204	4.545	-0.0206	-3.221
	(0.178)	(0.141)	(19.39)	(9.672)	(5.294)
prot1900	-0.0303	-0.0872	3.023	7.061	-0.560
	(0.168)	(0.134)	(14.39)	(7.986)	(4.874)
orth1900	-0.347	-0.0142	13.50	5.183	-4.111
	(0.248)	(0.200)	(23.51)	(11.43)	(5.753)
mus1900	-0.0858	-0.0544	31.85	-38.94***	-9.189*
	(0.171)	(0.129)	(20.44)	(10.11)	(5.187)
Constant	1.603***	1.575***	45.09***	60.75***	9.572*
	(0.201)	(0.162)	(16.55)	(8.267)	(5.190)
Observations	49	49	49	47	47
R-squared	0.355	0.379	0.332	0.862	0.637

Table 6: Religion (2) Herfindal index of religious homogeneity

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.580*** **	**-0.538*** **	**34.76*** **	**-20.71***	**-0.715**
	(0.141)	**(0.122)**	**(10.75)**	**(11.71)**	**(2.385)**
aut	**-0.310** **	**-0.264***	**13.42**	**2.792**	**3.120**
	(0.146)	**(0.145)**	**(9.662)**	**(6.131)**	**(2.070)**
egalnucl	**-0.472*** **	**-0.494*** **	**29.09*** **	**-3.586**	**5.555*** **
	(0.148)	**(0.112)**	**(9.577)**	**(6.288)**	**(1.983)**
oecd	-0.0835	-0.0648	7.344	9.304	1.044
	(0.0915)	(0.0654)	(9.667)	(9.180)	(1.875)
laam	0.198	0.168	-10.74	-28.73***	-8.126***
	(0.166)	(0.115)	(13.26)	(8.080)	(2.102)
africa	-0.107**	-0.0183	7.653	-12.48*	-2.683**
	(0.0419)	(0.0441)	(11.00)	(7.367)	(1.322)
herfrel1900	0.370*	0.108	-3.673	-17.92	-4.881
	(0.188)	(0.152)	(20.11)	(14.03)	(3.655)
Constant	1.378***	1.480***	49.93***	72.88***	10.46***
	(0.174)	(0.145)	(14.02)	(10.21)	(2.958)
Observations	49	49	49	47	47
R-squared	0.381	0.378	0.252	0.684	0.534

Table 7: Urban

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.546*** **	**-0.535*** **	**35.11*** **	**-19.13***	**1.135**
	(0.156)	**(0.129)**	**(10.79)**	**(10.26)**	**(1.799)**
aut	**-0.233**	**-0.243***	**13.95**	**0.871**	**1.949**
	(0.148)	**(0.137)**	**(8.367)**	**(4.002)**	**(1.350)**
egalnucl	**-0.413** **	**-0.483*** **	**32.40*** **	**-0.495**	**5.495*** **
	(0.167)	**(0.125)**	**(8.414)**	**(4.155)**	**(1.514)**
oecd	-0.0288	-0.0474	8.495	8.510	1.602
	(0.0942)	(0.0574)	(9.107)	(7.970)	(1.639)
laam	0.235	0.181	-10.72	-32.89***	-7.427***
	(0.175)	(0.123)	(12.95)	(7.230)	(1.766)
africa	-0.0827*	-0.0112	13.30	-7.366	-3.295***
	(0.0433)	(0.0337)	(10.62)	(5.661)	(1.136)
urban	-3.24e-06	-1.30e-06	0.000238	0.000491***	9.14e-05***
	(2.39e-06)	(2.54e-06)	(0.000236)	(0.000140)	(2.74e-05)
Constant	1.813***	1.634***	26.66	22.22*	-0.626
	(0.240)	(0.239)	(21.14)	(13.23)	(2.448)
Observations	55	50	55	64	73
R-squared	0.338	0.382	0.208	0.753	0.541

Table 8: Democracy

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.663** **	**-0.543** **	**44.77** **	**-37.60*** **	**-3.729**
	(0.306)	**(0.248)**	**(21.40)**	**(8.632)**	**(2.636)**
aut	**-0.337***	**-0.349** **	**17.42**	**0.712**	**2.239***
	(0.186)	**(0.150)**	**(11.17)**	**(4.693)**	**(1.193)**
egalnucl	**-0.330**	**-0.453*** **	**28.93*** **	**-9.371** **	**2.441***
	(0.200)	**(0.139)**	**(9.305)**	**(3.658)**	**(1.370)**
oecd	-0.217*	-0.114	6.885	9.592	0.297
	(0.119)	(0.106)	(15.08)	(5.673)	(2.228)
laam	0.00230	0.115	-11.75	-28.30***	-8.212***
	(0.198)	(0.132)	(18.20)	(7.620)	(2.429)
africa	-0.134	-0.0609	-18.07*	-7.621	-7.392**
	(0.0894)	(0.0560)	(10.46)	(5.094)	(3.025)
polity2_1900	-0.00357	0.00299	0.114	0.444	-0.0918
	(0.0127)	(0.00972)	(0.955)	(0.366)	(0.0900)
Constant	1.755***	1.587***	48.09**	60.68***	9.344***
	(0.237)	(0.194)	(18.91)	(6.762)	(2.574)
Observations	34	33	34	39	45
R-squared	0.265	0.355	0.275	0.863	0.535

Table 9: GDP and Share of elderly

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.583*** **	**-0.591*** **	**38.07*** **	**-14.76*** **	**0.915**
	(0.179)	**(0.146)**	**(11.53)**	**(4.596)**	**(1.435)**
aut	**-0.203**	**-0.232***	**12.51**	**-4.331**	**0.467**
	(0.148)	**(0.136)**	**(8.791)**	**(3.898)**	**(1.138)**
egalnucl	**-0.365** **	**-0.487*** **	**31.28*** **	**-13.02*** **	**2.243**
	(0.173)	**(0.127)**	**(8.843)**	**(4.157)**	**(1.359)**
oecd	0.0453	0.0142	3.427	-2.484	0.00698
	(0.118)	(0.0812)	(10.89)	(3.541)	(1.410)
laam	0.118	0.122	-6.369	-5.984	-1.292
	(0.190)	(0.121)	(15.89)	(5.345)	(1.813)
africa	-0.142**	-0.0459	15.26	1.682	0.422
	(0.0552)	(0.0646)	(13.47)	(3.230)	(0.707)
pop_65_2000	-0.00870	-0.00274	0.0504	2.655***	0.670***
	(0.00703)	(0.00570)	(0.978)	(0.424)	(0.106)
lngdppc	-0.0652	-0.0636	5.812*	5.650***	0.418
	(0.0494)	(0.0571)	(3.419)	(1.837)	(0.323)
Constant	2.230***	2.132***	-6.655	-18.35	-4.454*
	(0.481)	(0.545)	(33.20)	(15.49)	(2.509)
Observations	54	49	54	65	75
R-squared	0.350	0.393	0.204	0.885	0.742

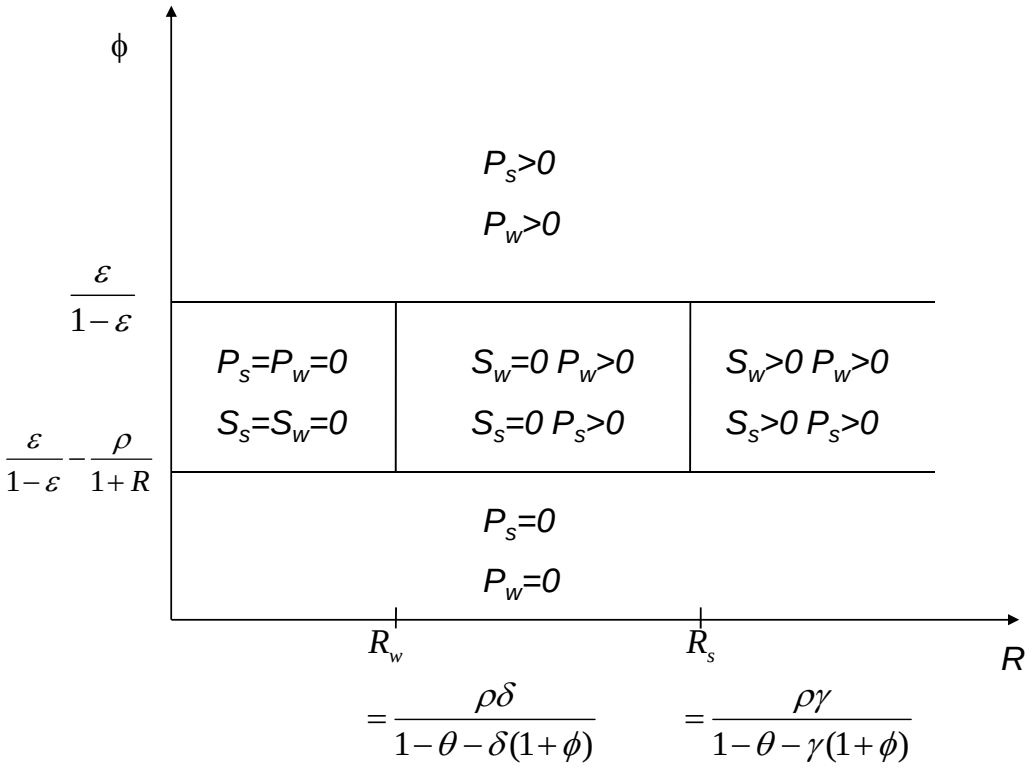
Table 10: Electoral rules and forms of government

VARIABLES	(1) repl50_1	(2) repl75_150	(3) replacem1	(4) coverage1564	(5) pengdp_91_2006
community	**-0.399***	**-0.495** **	**18.85**	**-36.62*** **	**-3.310***
	(0.197)	**(0.192)**	**(11.57)**	**(10.75)**	**(1.669)**
aut	**-0.0943**	**-0.182**	**0.359**	**-12.96***	**-1.372**
	(0.220)	**(0.201)**	**(10.05)**	**(7.552)**	**(1.426)**
egalnucl	**-0.287**	**-0.438** **	**19.11** **	**-18.71** **	**1.906**
	(0.194)	**(0.162)**	**(7.290)**	**(7.114)**	**(1.545)**
maj	0.188	0.0906	-17.50***	-15.60**	-3.830***
	(0.198)	(0.175)	(6.152)	(7.456)	(1.006)
pres	-0.176	-0.149	1.665	-8.651	-1.001
	(0.167)	(0.152)	(9.593)	(6.410)	(0.667)
oecd	-0.0865	-0.0836	9.918	5.619	1.052
	(0.113)	(0.0712)	(10.62)	(7.794)	(1.424)
laam	0.366	0.303	-11.36	-26.83***	-7.564***
	(0.252)	(0.195)	(14.30)	(7.382)	(1.632)
Constant	1.489***	1.519***	57.46***	77.94***	10.46***
	(0.223)	(0.195)	(13.24)	(10.69)	(1.790)
Observations	41	39	41	46	52
R-squared	0.257	0.339	0.255	0.736	0.584

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 1. The New Regime: Summary of the results



S_s *(P_s)* are savings (Pensions) in strong family types
S_w *(P_w)* are savings (Pensions) in weak family types

figure 2: The four groups

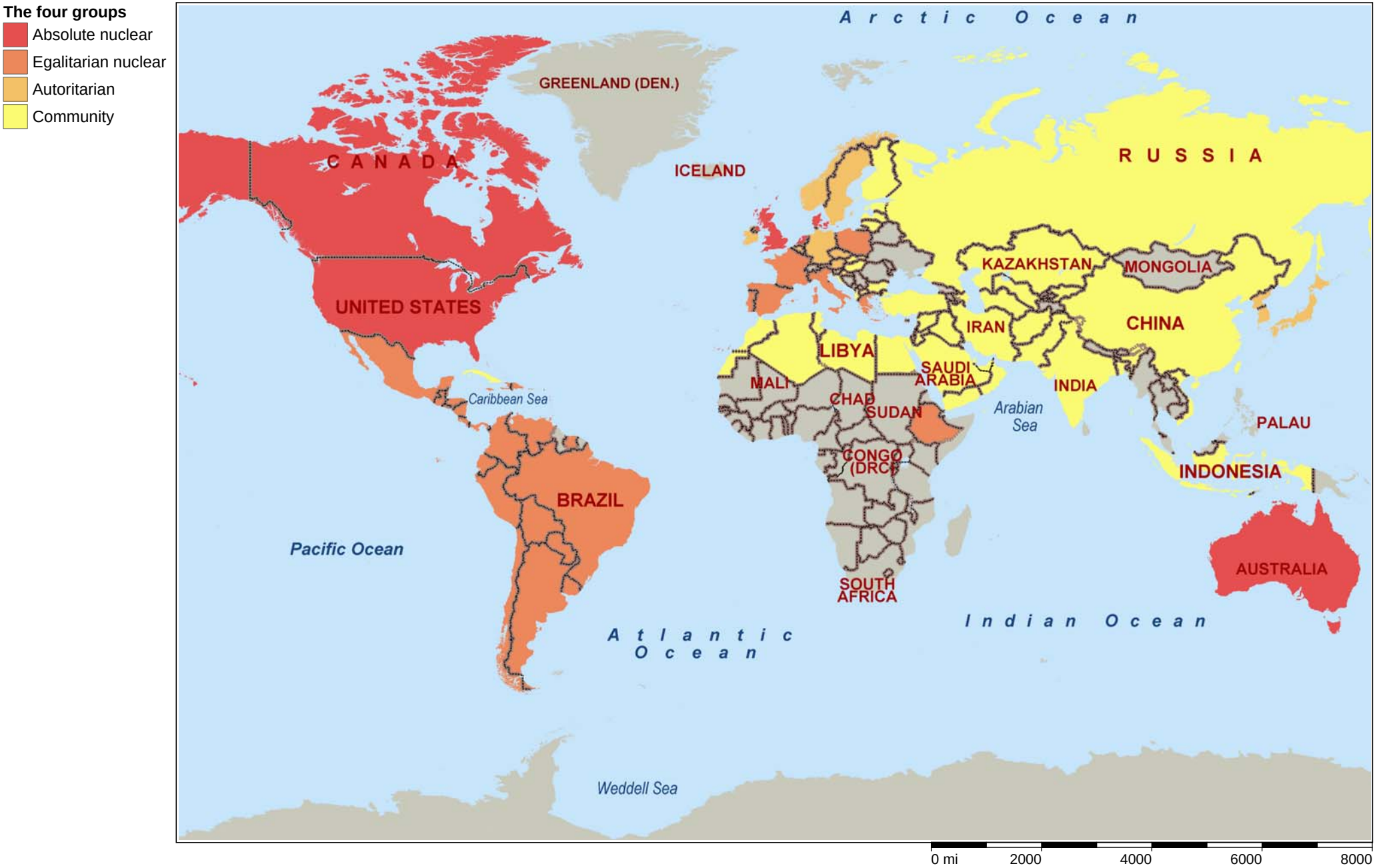


figure 3: The redistributive design of pensions: repl50_1

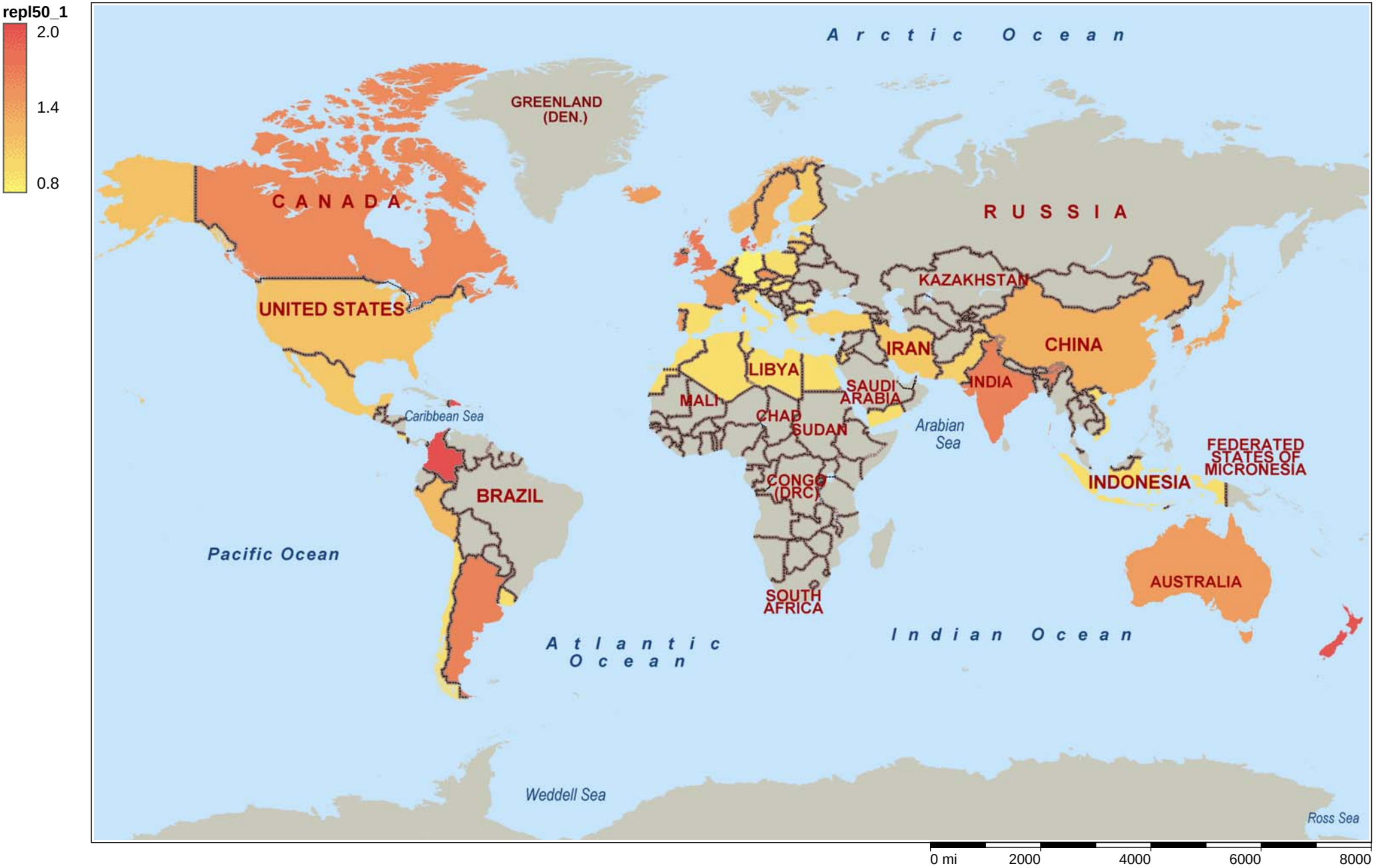


figure 4: The redistributive design of pensions: repl75_150

figure 5: Legal origins

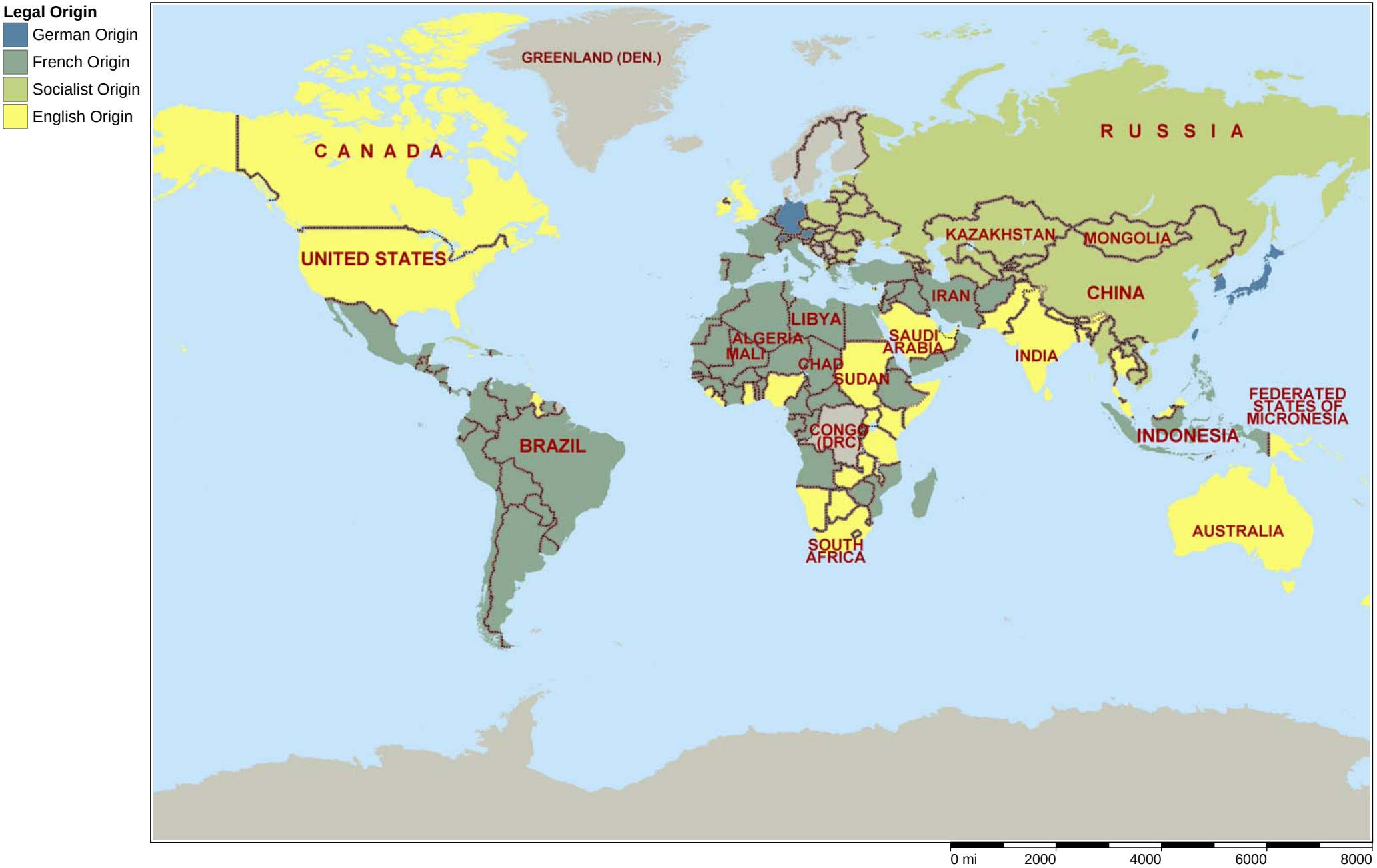


figure 6: Religion

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