The Political Origin of Pension Funding

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Abstract*

The reliance of pension systems on private funding varies greatly across countries. This paper identifies large inflationary shocks in the first half of the XX century which devastated middle class savings in some countries. Such shocks may have shaped political support for capital markets and social insurance ahead of the establishment of universal pension systems, which in all countries took place after the Great Depression. We present evidence that reliance on state pensions is well explained by these wealth distribution shocks. The economic effect is huge: a large shock reduces the stock of private retirement assets by 58% of GDP. The results stand after controlling for complementary explanations, such as original financial development, legal origin, past and current demographics, religion, electoral voting rules, national experiences with financial market performance, or other major financial shocks that were not specifically redistributive. However, it is hard to disentangle whether the change in political preferences is driven by a shift in economic interest or in ideological beliefs.

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1. Introduction

Few economic issues are as controversial at present as pension funding. Increased longevity and declining birth rate have affected the ability of pension systems to cover pension liabilities. The pension reform debate is particularly intense in countries with a pay-as-you-go (PAYG) system, where it is an open question how the financial consequences of projected shortfalls will be distributed across social groups. To appreciate the sources of political resistance against urgent reforms, it is therefore important to understand the determinants of the original choice on pension funding structure.

Most systems have both state and private features (even the US has a significant Social Security component), but the reliance on capital market funding varies considerably across OECD countries, far more than their capital market size. Yet the earliest worker pension plans, starting in Germany in the 1880s, were private liabilities in all countries which adopted them, and remained a private matter until after the Great Depression.[1] While often revised, current pension systems largely reflect the degree of reliance on state versus private liabilities introduced in their original design around WW2.

When was the government entrusted with most retirement liabilities in some countries, while elsewhere private funding was preferred? Why does Finland have so little private pensions in comparison to Denmark or Sweden, or Belgium in comparison to the Netherlands, or Switzerland so much relative to Austria? [2] This paper seeks to identify the institutional determinants of this critical choice, and relate them to the major shifts in financial market development in the interwar period, the Great Reversal identified by Rajan and Zingales (2003).[3]

From their onset in the 1880s to the massive expansion which took place in 1935-1950, practically all non state worker pensions were private liabilities (although some

[1] Cutler and Johnson (2004) find only income and ethnic fractionalization weakly explains the timing of adoption of state pension systems.

[2] Unfunded pension systems (PAYG) have some notional funding, as state pension institutions receive specifically issued public debt. Clearly, these assets exist only on paper, as they are backed by fiscal revenues just as any government liability.

[3] Rajan and Zingales attribute these shifts to a major political shift in favor of corporate insiders and established firms after the Great Depression, rather than a shift in median voter preferences.

state pensions were granted, e.g. to civil servant and war veterans). Thus countries which adopted a significant role for state funding did so when the universal coverage system was set up after the Great Depression. This paper argues that this historical pension funding choice reflected specific political preferences by the middle class as shaped by economic shocks in the tumultuous interwar period.

Economists attribute political preferences to economic interests, while political scientists attribute an autonomous role to ideology. Our empirical approach cannot easily separate the two sources, although the evidence is that economic interest does play some role. The economic interest argument states that when the middle class has a high degree of financial participation, it has an interest in supporting minority investor protection. This justifies investing pension contributions in capital markets and promotes financial development. In contrast, in a democracy where wealth is concentrated and the middle class relies mostly on labor income, a political majority prefers corporatist policies in favor of labor protection and against minority investor protection (Pagano and Volpin, 2005; Perotti and von Thadden, 2006).[4] The political economy prediction is that if at the time of the choice on pension funding the middle class does not support investor protection, it will rationally entrust pension contributions to the state. As weak investor protection affects financial development (La Porta et al, 1997, 1998), this pension choice has a strong effect on financial orientation.

This papers uses wealth distribution shocks which were large enough to affect median voter preferences and thus explain a major shift in investor protection. Major shocks affected countries in Continental Europe which underwent major reversals in financial market development in the interwar period, as identified by Rajan and Zingales (2003). As a result of the loss of their savings, the middle class came to depend more on its labor income and sought more corporatist policies, aimed at protecting inside labor while weakening investor protection. Subsequent enforcement and regulatory choices in affected countries weakened control rights for minority investors, granting control to banks, the state and large, undiversified shareholders, while reducing protection of dispersed investors. The shocks may have also led to ideological hostility to capital

[4] Pagano and Volpin (2006) model and offer evidence on how better initial investor protection induces companies to issue more equity and thereby leads to more equity issuance, which in turn expands the shareholder base and increases support for shareholder protection.

markets, shifting not just economic interests but also beliefs (Roe, 2006). Lindert (1994) argues that the world wars required mass mobilization, at which time governments made generous promises to troops which came due after the war. Yet even though social programs were expanded after WW1, and considerably more during the Great Depression, a political majority appeared to have maintained support for investor protection in countries where the middle class had managed to keep its savings.

Political preferences and their effect can persist through various channels. First, they may become embodied in ideological beliefs which are not easily reversed even when savings are restored. Second, state pension funding creates a self-reinforcing effect, by reducing middle class participation in financial markets and thus its support for investor protection. Third, reversing major legislative changes requires strong coordination, especially when the change has benefited entrenched interests.

While pensions were modest till the 1930s, all countries expanded them massively whiel introducing major state funded social programs after the Great Depression, with the US creating Social Security in 1935. In our sample, all large shocks occurred before the national creation of universal social insurance programs.[5] Our conjecture is that overall pension funding was deeply affected by prevailing political preferences on investor protection at that time. We test it by regressing accumulated private pension assets in a sample of democracies against these shocks, along with other explanations in the literature. The results indicate a strong economic and statistic effect of wealth shifts. In particular, a single episode of very high inflation reduces the stock of current private retirement assets by 58% of GDP. The result is robust to an extensive set of controls for alternative or complementary causes driven by institutional differences. We consider historical and current demographics, legal origin, formal political institutions such as democracy and electoral voting rules, religion, historical financial development, and the national experience with average inflation and financial returns. The tests deliver evidence on complementary effects, but the role of the prices shocks remains very robust and statistically dominant.

[5] While many countries experienced major price shocks after WW1, others suffered their worse inflation during civil wars or after WW2.

This paper relates to the growing literature on pension programs and their sustainability. The political economy of pension and social security systems have been examined, among others, by Conesa and Krueger (1999) and Cooley and Soares (1999). Svensson and Tabellini (2000) show that age and income distributions are critical to determine social security claims. Social security programs arose around the world in early 20th century as a result of demographic and democratic changes as well as urbanization (Lindert, 1994, Caucutt et al., 2006). Lindert (1994) finds that changes in income growth had little impact on the rise of social security spending. While public spending on pensions did not exceed 1% of GDP for most developed countries, in 2001 public spending on old age benefits amounted to 7.6% on average in the OECD countries. Overall, the rise in social spending and pension programs has a large component which appear exogenous to political orientations. Taking a long-term perspective, Mulligan, Gil and Sala-i-Martin (2002) address the relationship between social security spending and democracy. Our specific effort is to identify the determinants of the relative share of private to state pension funding.

Our sample is unfortunately quite small. It is however almost exhaustive relative to the existing population of representative democracies with a history of universal pension programs. Our identification benefits from large variation both of pension funding and of inflationary shocks. In fact, the cross country variation in pension funding dwarfs the variation in financial development among democracies.

The paper is structured as follows. The next section sketches our hypotheses. Section 3 contains the empirical tests. We conclude in Section 4.

2. History and causes of pension funding

The earliest pension system was created in Germany under Bismarck, who legislated a mandatory program for some categories of workers, especially in large firms where they were most exposed to socialist ideas (Lindert, 1994, and Cutler and Johnson, 2004). The program relied on worker and firm contributions and enjoyed some fiscal benefits. The pension claims were extremely modest, and could be drawn only upon reaching 70 years of age, at a time where most workers die well before 60 years.

Interestingly, the contributions were invested in financial securities, just as the programs which imitated the German example in subsequent years in other European countries. The program had no redistributive feature (Lindert, 1994). Until the Great Depression, most states had no direct role in worker pensions, limiting state pensions to civil servants and war veterans.

In the five decades prior to WW1, the so-called "Victorian" period, the western world was largely at peace. Industrial productivity rose rapidly, albeit with wide swings, and prices were stable or declining. Long-term contracts for house and land rentals were common; long term fixed rate debentures normal. In the UK, government debt included a fair share of perpetual bonds with a fixed nominal rate. While there were sharp stock market crises, occasional bank failures and railway bankruptcies, their financial impact were circumscribed to few wealthy individuals, while price stability ensured financial stability for individuals who had deposits, bonds, rental income or other nominal assets.

The destruction of World War in 1914, after fifty years of peace, caught Europe by surprise. After the war, countries which had seen heavy fighting on their territory faced huge costs of reconstruction, while the loser countries faced massive reparations and suffered large losses of control over territory or industry. Social demands rose rapidly as veterans came back armed amid fears of a socialist uprising. These urgent spending needs often could not be fiscalized given the economic destruction, and governments were forced into rapid money printing, leading to a sharp acceleration in inflation.[6] Austria and Germany experienced devastating hyperinflations, but also winners such as Italy, Belgium and France had massive price jumps. In contrast, the UK, which escaped invasion and direct damage, managed to finance its war expenditures by running down its large stock of private foreign assets against newly issued public debt. Its non European allies, such as the US or Australia, were far from the area of war destruction and could also redistribute the war cost over time. Within Continental Europe, the Netherlands, Scandinavia and Switzerland were also spared. Some other countries which were not drawn in WW1, suffered sharp inflationary shocks as a result of civil wars.

[6] In occupied countries, such as Belgium and France, inflation took off during the war because the occupying forces took control of the printing press to fund their war efforts.

The devaluation of long-term nominal contracts, diffused after long price stability, hit all social classes, and hit hard the middle and lower middle class which relied on monetary savings or rental income. Many were reduced to sell real property to survive. By most contemporaneous accounts, a large fraction of the middle class lost all its financial holdings, small firms were hard hit, and wealth became much more concentrated (Eulenburg, 1924). Other classes suffered greatly from the economic devastation, but this did not alter their policy preferences, e.g. for redistribution.[7]

The inflationary shocks had a seismic effect because it hit a class which became politically critical after 1918, when most European countries moved to universal suffrage. In countries where the middle class had been impoverished, a political majority shifted support to less market-friendly policies (in extreme case, such as in Italy, Germany and Spain, to less democratic institutions) and to a greater role for corporatist policies, bank dominance over capital markets, and state intervention (Perotti and Thadden, 2006). Corporatist policies, with higher labor protection, weaker competition, and nationalistic policies, found support among both inside labor and inside capital. [8]

At the time of these shocks, worker pensions were still provided by companies, and pension payments were minimal. Price shocks may have had a mechanical effect on pension funding, by destroying the stock of pension assets, and thus forcing public funding to maintain payments. In any case, no affected country chose to bail out private pension obligations after their major price shock. Yet even if a state subsidy had been needed to cover a shortfall, funding for future claims could be built up by contributions, just the choice made recently in Eastern Europe. Many Eastern European countries, where the role of the state had been discredited by their communist past, chose to couple state guarantee for older cohorts with pre-funding for younger workers.

The critical decision on pension funding arose after the Great Depression. The stock market crash of 1929 hit hard mostly the moneyed classes, but the depression led to corporate insolvencies and massive unemployment, leading to the establishment of major social programs in all countries. Mandatory universal pension systems were established

[7] Piketty et al (2006) show that many very rich renters in France were financially devastated by the post WW1 inflation, reducing wealth inequality at the very top of the distribution.

in most developed countries between the late 1930s and the early 1950s. Our hypothesis is that in countries where financial markets enjoyed political support, the choice was to rely predominantly on market funding.[9] In contrast, in the affected countries the pension system was entrusted to the state, a choice which represented a shift relative to a early history of privately funded pension systems.

Fortunately for our test, the largest inflationary shock in all countries in our sample came before the establishment of the universal retirement system.[10] For most countries the establishment of the major social security program (defined as a comprehensive retirement program covering most production workers) came after WW2. Table 1 provides an overview of the estimated timing of major pension initiatives across countries, and suggests that the structural decisions on pension structure took place after the major financial crises of the interwar period.

Alternative causes of pension structure

In addition to our political shift argument, we consider legal, financial, cultural, and other political explanations.

Market funding may have been chosen in countries with a strong financial orientation.[11] Accordingly, we control for legal origin, an exogenous country feature associated with investor protection (La Porta et al, 1997, 1998), and test the explanatory power of historical financial orientation, as measured by financial development prior to the shocks. More generally, experiences with large financial crises or low returns may have affected the population's attitude towards security markets, creating demand for more state insurance. We accordingly control for large negative shocks that had no comparable redistributive effect for pivotal voters, such as the 1929 stock market crash.

[8] Roe (2006) argues that ownership concentration increased because capitalists sought to resist increased labor activism. Unfortunately the scarce data on ownership makes it hard to assess whether larger control blocks emerge in left oriented systems, with the visible exception of Sweden.

[9] In fact, minority investor protection improved in these countries, e.g.. with the establishment of the SEC and laws against concentration of financial power in the US, and a revised UK company law after WW2.

[10] Japan suffered hyperinflation just after WW2, and subsequently experienced a major reorientation of its financial system with increasing insider and bank dominance, coupled with better labor protection.

[11] The strong correlation between pension funding and current market capitalization is easily explained by long-term demand by pension funds. They may increase total demand if they induce forced savings, better diversification or if they have a coordinating role, e.g. by avoiding panics among dispersed investors.

Finally, we test whether the effect of inflation comes from its average rather than its extreme values.

There are other political explanations for preference for state pensions next to the wealth distribution argument. A simple argument, common in overlapping generation models, is that state pensions were chosen because of a large demographic weight of senior citizens at the time. A PAYG system allows to start immediately large payments to the old, or allow it to benefit from a high expected population growth (Conesa and Krueger (1999), Cooley and Soares (1999), and Tabellini (2000). Another distinct political argument is that a population with an unequal income distribution may prefer state pensions funded by progressive taxation.[12] Testing these explanations requires controlling for measures of demographics and income inequality around the time of the historical pension funding decision.

Finally, we consider structural political explanations, such as the effect of democracy and electoral voting rules. We test whether more state funding reflect the bias toward public spending identified by Svensson and Tabellini (2003) for proportional voting regimes which rely more on coalition governments.[13]

Finally, we consider cultural explanations. As a time invariant factor, we consider religious orientation. Religion appears to affect financial development (Stulz and Williamson, 2003), but also preferences for mutuality in risk sharing, with Catholics more likely to favor coinsurance than individualistic Protestants (Cutler and Johnson, 2004). To consider potentially time varying cultural factor, we introduce a cross cultural variable from 1960s, namely uncertainty aversion, from Hofstede (2001). This variable measures the average national aversion to operate in highly uncertain and ambiguous situations, such as what arises after a devastating price or war shock which undermines the normal capacity to adjust. Our goal is to account for the common opinion that wars or hyperinflations had a traumatizing effect on beliefs in some countries, leading to deep seated insecurity about "unpredictability" and induce diffuse demands for economic

[12] State funding is not per se more redistributive, in fact the most redistributive systems are those where the state funded component is small and targeted to lowest income groups (such as the UK). In PAYG countries, pensions are usually closely linked to wages. More in general, there is no empirical evidence of larger fiscal redistribution in more unequal democracies.

[13] There is evidence that majoritarian systems, where coalitions are less common, have smaller governments and welfare programs relative to proportional systems (Persson and Tabellini, 2004).

security by the state. This may have led to an ideological polarization in countries ravaged by war, as discussed extensively in Roe (2006), which combined with the economic shock suffered by the middle class could have induced most voters to prefer state funding for retirement. While it is impossible to separate fully a shift in beliefs from a shift in economic interest, our empirical question is whether uncertainty aversion absorbs all the explanatory power of price shocks.

3. Empirical analysis

This section describes the sources of data and the construction of the variables and presents the empirical analysis.

Data Sources and Description of Variables

Our measure of private pension funding is the ratio of capitalized private pension assets to GDP or to an estimate of pension liabilities. We use OECD data (OECD Newsletter, 2005) which includes all types of pension plans: occupational, personal, mandatory and voluntary. Asset reserves from social security systems, reflecting government bonds held by the state itself, are excluded. We include all countries where current pension assets reflect a historical choice taken under a democratic government, so we exclude former Communist countries. The variable PENSION represents the percentage of funded pension assets over GDP in 2004, while PENSION+LIFE also includes accumulated life insurance assets.[14] We also investigate the ratio of pension assets to our estimates of total pension liabilities, under the assumption that regulation ensures adequate funding of private pension liabilities (Barr and Diamond, 2006). This is shown graphically in Figure 3.

Information on price series was collected from the Global Financial Database (from Global Financial Data Corporation) and other sources (Maddison, 1991, Mitchell, 1992, as well as national banks and governmental statistical agencies. We constructed several variables for inflationary shocks, reported in Table 2. The variable SHOCK is a

[14] We performed the same analysis on pension assets data of 2002, with very similar results.

dummy variable equal to one if the country experienced a period of extremely high inflation during 1900- 1970 (in all cases, prior to the establishment of the universal pension program), defined as an annual increase in consumer price index (CPI) of over 400%. HIGH_INFLATION is a dummy variable equal to one if the country's highest annual increase in CPI in the period 1900 to 1970 was at least 30%. (No results are affected if we increase the threshold to 70%). As a final measure, we use the actual highest annual increase in CPI between 1900 and the establishment of the major pension program (denoted MAX_CPI). For countries that experienced hyperinflation, we set their value to the highest level for those countries that did not have experience hyperinflation (i.e., to 491.6%, for Italy). Data on annual old age benefits expenditures by governments were obtained from OECD Social Expenditures Database (SOCX).

From La Porta *et al.* (1997) we take the legal origin dummy variable, labeled COMMON_LAW.[15] We further collect from OECD (2004) stock market capitalization in 2002, denoted by Current MARKET_CAP, as well as the one in 1913 (MARKET_CAP_1913). The percentage of Catholics in each country and information on the electoral rules are taken from Tabellini et al (2003).[16]

We collect data on alternative factors that may have affected preferences or beliefs during the period under consideration. To explore the impact of other crises,[17] we construct a variable CRASH1929 which captures the size of the crash in the domestic stock market from the market high until the through (Taylor, 2002). We also collect data on demographics, specifically the proportion of older people, at different points in time. Its current value controls for the stock of pension liabilities, while its value at the time of the pension decision measures the size of a political block favorable to a fiscalization of pensions. The variable POP1950_ 65+ measures the proportion of the population over 65 years old, using US Census information (cf. www.census.gov/ipc/www/idbsprd.html). The historical values are taken for 1950, in some cases for either 1951 or 1960-1961 if data is not available for earlier years. Finally, to test the impact of income inequality, we use the historical data around the historical pension choice from Forbes (2000).

[15] Iceland is not included in the study of La Porta *et al.* (1997), but it has Scandinavian legal origin (Iceland is a former Norwegian crown colony, and was later ruled by Denmark until 1814).
[16] We use current information on these variables, as they should not have changed much in the meantime.

We have complete information on 16 countries and partial information on 8 more countries. For all 24 countries, we do have information on inflation and pension assets.

[17] Note that some countries experienced their stock market shock already in 1928 (for some countries, the market top is already earlier). See Taylor (2002) for more details on each country's exact date.

Descriptive Statistics

Table 2 shows the summary statistics. On average, the ratio of funded pension and life insurance assets over GDP was 61.6% in 2004 (34.3% for pension assets only). There is great dispersion in the sample, with a minimum of 0% for Greece and a maximum of 153% for Switzerland. The median is 54.1%, somewhat lower than the mean. The US had a fraction of funded pension and life insurance assets over GDP of 115%, higher than the sample average but by no means the highest.

Overall, 25% of the countries in our sample experienced a dramatic inflationary shock or hyperinflation during the period considered (the dummy variable SHOCK). Moreover, Table 2 indicates that 62.5% (i.e., 15 countries) had a period of sharply high inflation (at least a 30% increase in CPI in a single year). A quarter of the sample is composed of common law countries. None of these countries have experienced a huge inflationary shock, which is consistent with our argument based on the location of military fighting.

The stock market crashes of 1929-1930s caused huge share price drops around the world, about 65% on average. The dispersion however is relatively low (the standard deviation is 14.3%). The largest decrease in stock prices was experienced in the US, with 86.2%, but other countries had quite similar magnitudes.

There is very little variation among countries in the proportion of older people in the population (POP1950_65+), with an average of 8.7%. While this suggests that the hypothesis can only have a modest explanation power, it may make a difference at the margin, if senior citizens are politically pivotal.

Figure 1 presents the univariate relationship between PENSION+LIFE and the dummy variable SHOCK graphically. A clear negative link between inflationary shocks and accumulated pension assets suggests that outliers do not drive our results. This is confirmed by similar graphs using the other inflation variables (not shown here). Figure 2 shows the relationship between legal origin and funded pension assets. There, the link appears less clear, although the figure seems to indicate a slightly positive relationship.

Empirical results

Table 3 gives our basic results. The effect of a hyperinflationary shock on funded assets is very strong, whatever the specifications of the shock. The economic effect is impressive: countries that experienced a hyperinflationary shock have less funded pension assets in 2004 than the rest by an amount equal to 58.5% of GDP. The variable explains 31% of the variation by itself. The hyperinflation variable SHOCK remains significant when estimated together with HIGH_INFLATION (Regression 2), which indicates that the significant impact is not only due to extreme cases. In fact, our results hold using a continuous variable of the highest CPI increase in the period, MAX_CPI (Regression 3). [18]

Regression 4 (Table 3) shows that common law countries do not have a greater propensity to a more privately funded pension system. Legal origin is either not significant or has the wrong sign, while the economic and statistical effect of the inflationary shock remains at the same level of magnitude as in the univariate analysis.

Our sample does not include any common legal origin democracy which experienced a hyperinflation, so we cannot include an interactive term. In its place, we consider the effect of legal origin in the sub-sample of countries that did not experience hyperinflation (Regressions 6 – 9, Table 3). Surprisingly, even in this selected sample legal origin does not contribute in explaining pension funding. [19]

In Table 4, we estimate the basic relationship using alternative measures of private pension funding. In Regressions 1 – 4, we exclude life insurance reserves from the accumulated pension assets (the variable PENSION), obtaining similar results. The main effect is that common law, while insignificant, has no longer a negative coefficient. Next we control for the level of unfunded pension liabilities. Since no OECD data is available, we estimate pension liabilities by capitalizing recent annual old age benefit expenditures in each country.[20] In Regression 5 – 8 (Table 4), we run regressions on similar specifications but using funded pension assets (PENSION+LIFE) as percentage

[18] It is not possible to estimate SHOCK and MAX_CPI jointly, given their very high correlation (95%).
[19] This leaves the question why democratic common law countries did not experience hyperinflation. The simplest explanation is that none of them has been subject to military invasion or major war devastation.

of total pension liabilities (PENSION+LIFE plus estimated unfunded pension liabilities). The effect of inflationary shocks remains strongly significant.

Alternative Hypotheses

We consider now the other alternative hypotheses.

Table 5 focuses on demographics. The variable POP1950_65+ factors in the percentage of older people in the population at the time of pension creation,[21] which is supposed to result in more support for PAYG. As robustness check, we also examine the fraction of total population in 1950 that is the age bracket of 15-30 years old. The variable POP2004_65+ provides a rough proxy for future liabilities as it measure the fraction of the population older than 65 years in 2004. We find no support for a direct role of demography as predicted by Conesa and Krueger (1999), even in a univariate setting. Moreover, the shock variables remain significant when estimated jointly with the demographic variables.

In Table 6, we investigate alternative political explanations. We first test a complementary but distinct political economy view that income inequality (as opposed to wealth inequality) is critical to pension funding, under the presumption that state pensions are more redistributive, or offer more social insurance. We use the earliest available data on income inequality from Forbes (2000) on the Gini coefficient in the 1960s. Interestingly, more unequal society do rely more on state funding, but this effect is less significant than the wealth inequality shifts caused by price shocks. In any case, this points to a concomitant political factor in shaping the redistributive or social insurance features of the pension system.

We then investigate the role of the electoral voting rule, majoritarian versus proportional (Regressions 4 – 6). While it helps explaining pension assets in a univariate setting, it is insignificant when inflationary shocks are included.

[20] We capitalize liabilities by discounting at 5% a perpetual annuity based on current pension payments, which is clearly imprecise but should capture size.

[21] We use the earliest date for which we have the data, namely 1950, close to the timing of pension creation for most countries.

The next test is whether non-democracies exhibit a different pattern in pension funding choice, as the theory suggests. A dummy variable takes value one if the countries were not democratic at the time the major pension plan was put in place, which is the case of Mexico, Portugal, South Korea and Spain. The non-democracy dummy is highly significant and negative (Regressions 7–8). The inflationary shock variables remain highly significant and of the same magnitude even in the rest of the sample (Regressions 9–10).

We also focus on alternative financial explanations that we report in Table 7. We add the impact of the stock markets crash of 1929 (CRASH1929), historical financial orientation before the shocks (market capitalization in 1913) annual real stock market returns from 1950 to 2004 (STOCK_RETURNS) and average annual inflation over several time periods.[22] The political economy hypothesis predicts that capitalization and pension funding will be jointly determined by historical political preferences. Current stock market capitalization is clearly significant, but the political shock remains significant even after its inclusion. Also there is no evidence that historically more financially developed countries chose for more private funding, as its 1913 value is never significant. Long-run stock market returns are significant determinants of accumulated pension assets (Regression 4), as it may be expected, but they do not affect the significance of the price shocks. When we control for average yearly inflation (Regressions 5–6), results indicate that large shocks still matter predominantly.

Finally, we focus on the effect of culture on pension funding (Table 8). We seek to decompose the political consequences of the price and war shocks in a shift in economic interest and a shift in ideological/psychological attitudes towards the role of the state. To this goal we investigate the effect of Hofstede's uncertainty aversion, measured in 1960s. Indeed, uncertainty aversion is negatively correlated with the stock of pension assets. This is a result of distinct interest on its own, as it matches a common perception that those populations which suffered traumatic shocks may seek a greater role for the state, perhaps as a form of mutual insurance against systematic instability. Uncertainty aversion loses some significance once all price shocks are introduced, and the interactive

[22] We excluded years of hyper-inflation from the computation of average inflation. Some countries were excluded because of many missing data.

effect is not significant. Although the lack of earlier measures hinders a direct test that individuals which suffered a major shock became more uncertainty averse, this evidence is consistent with a psychological shift in these countries. However, uncertainty aversion does not absorb entirely the effect of the shocks, and so cannot be the sole channel for the effect of war and price shocks on the pension funding decision. At last, we control for the percentage of Catholics in the population. The variable is not significant, nor does it affect the impact of inflationary shocks.

Testing for the exogeneity of shocks

A critical question is whether the variation in inflationary shocks is indeed exogenous. In our sample, all major price shocks came after devastating world and civil wars which can be reasonably treated as exogenous. We see sudden inflation as the result of a money printing choice forced upon governments by extreme fiscal needs (Sargent and Wallace, 1981). In the aftermath of a major war, those countries which experienced heavy destruction faced urgent demands for public expenditures, just when the ability to rapidly raise fiscal revenues was at its lowest point. In some cases, loss of territory and colonies hit fiscal capacity hard. When spending needs are massive relative to fiscal capacity, there was little choice but to print money.[23] Moreover, inflation often started during the war in invaded countries, as the occupiers captured money printing for their own needs (e.g. in France and Belgium). Yet it is possible that, for a given war destruction, some type of government chose to print money, while other limited spending. Inefficient redistribution via inflation is more likely when political institutions are less accountable, e.g. the executive is subject to weak constraints. Accordingly, we verify whether the response of prices to war damage is correlated with the quality of political institutions at the time.

We measure war destruction with a self-constructed index of war destruction. This is the sum of three different dummy variables: Invasion (equal to one if the country was invaded, and territorial control switched hands, during the war prior to the

[23] Urgency after both wars will have been encouraged by veterans with recent military training coming to demonstrate in the capital, and the spread of socialist ideas.

inflationary shock), Intensity of Fighting (equal to one if the country had intensive fighting on its own territory, which is always true for the civil wars in the sample) and Major Losses in Territory (equal to one if the country had important loss of territory as result of to the war prior to the inflationary shock or civil war). This index ranges from 0 to 3, with a larger value implying greater war devastation.

Drawing from historical measures of political institutions from the Polity IV database, we use the composite index POLITY2 at time of the inflationary shock or highest inflation level (year of MAX_CPI). This data set has been widely used in other studies on the impact of democracy such as Mulligan, Gil and Sala-i-Martin (2002).

Table 9 presents a critical test of exogeneity for the price shocks. We seek to explain price shocks in terms of war shocks, the contemporaneous measure of political institutions, and their interaction. Under our conjecture, only the war shock should be significant. This appears clearly to be the case across all measures of war damage for SHOCK. Political variables either on their own or in interaction with war damage are insignificant. This suggests that inflationary shocks were indeed driven by military shocks, rather than being an avoidable choice undertaken by countries with poor political accountability. The results are less sharp once we seek to explain the much broader inflationary range represented by HIGH_INFLATION. While war damage is always very significant on its own, we cannot find any systematic effect in the general regression. We conclude that it is hard to explain inflationary episodes outside extreme shocks.

This raises the question as to whether our variable of war damage (WAR) can be a good instrument to separate the part of the political shock (our variables SHOCK, HIGH_INFLATION and MAX_CPI) that is attributable to the war. Table 10 presents the result as a two stage regression, with war shocks instrumenting for the price shocks. Our previous results remain significant.

4. Conclusions

This paper provides evidence that the funding structure of pension systems nowadays reflects historical political preferences on investor protection prevailing at the time of their creation. A preference for a mainly state pension system is closely related to

major war shocks in the early XX century, which shaped the economic and governance preferences of the middle class and were subsequently rationalized in an ideological view of the role of the state and capital markets. The initial choice for state funding may have been reinforced over time, as limited exposure to financial markets maintained low support for investor protection (Pagano and Volpin, 2006), even when conditions changed.

The evidence of a causal role for political shocks on pension funding parallels the history of the Great Reversals in the interwar period (Rajan and Zingales, 2003). Financial development regressed in several continental European countries and Japan where the middle class was hit hard by war experience. Major wealth distribution shocks affected both political and corporate governance regimes and the extent of labor rents in the interwar period (Perotti and von Thadden, 2006; Roe, 2006).

Our instrument is variation in inflationary shocks which led to large wealth shocks for the politically pivotal middle class. These inflation shocks appear to be exogenous, as they resulted from urgent spending after devastating world or civil wars, e.g. to demobilize troops and rebuild the infrastructure at a time of drastically reduced fiscal capacity. In luckier countries, where the highest inflation is mostly associated with the oil shock of the 1970s, the middle class kept its savings and its support for capital markets, and chose to rely on them to finance its retirement.

Our sample shows that while some countries suffered great war damage, they did not succumb to high inflation if they could fiscalize emergency spending over time. With no exception, these countries did not experience military invasions, such as the UK in both world wars. The sample also contains countries that did not suffer any military destruction, such as Germany in WW1, where an extreme burden of war reparations coupled with loss of territory and control over national resources caused hyperinflation. The political consequences of such shocks cannot be underestimated, as Keynes stated eloquently in his Political Consequences of the World War (1920).

The effect of past shocks, of course, may be reversed over time, and the middle class in Europe restored its savings after WW2. Yet in the affected countries it chose to invest mostly in deposits and other safe assets, consistently with the hypothesis of reduced political support for investor protection. Their corporate sectors accordingly

relied on bank intermediation and governance rather than capital markets. Many Continental European capital markets recovered in the last two decades, not least thanks to a massive privatization program, which diffused financial participation and created political support for capital markets (Biais and Perotti, 2002).

In conclusion, our results confirm the diffused impression that pension funding is a highly political issue. In the end, understanding the political determinants of pension structure is essential to help identifying the range of feasible solutions, and to predict to what extent structural features of existing systems, such as solidarity and coinsurance features, will persist.

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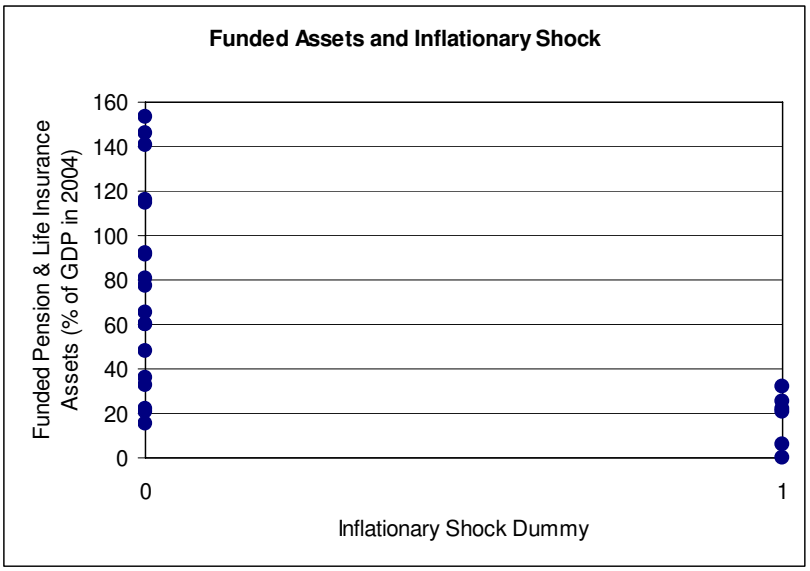

Figure 1 shows total funded pension and life insurance assets as percentage of GDP in 2004 (PENSION+LIFE) on the x-axis and SHOCK dummy on the y-axis.

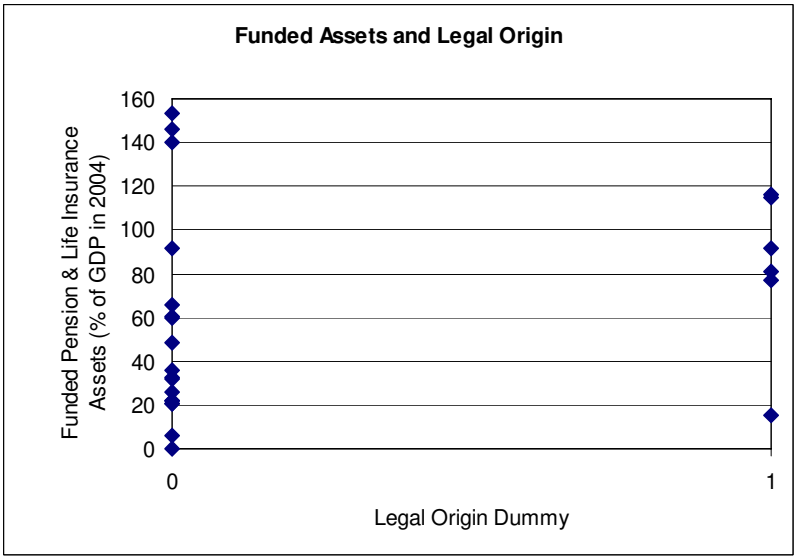

Figure 2 shows total funded pension and life insurance assets as percentage of GDP in 2004 (PENSION+LIFE) on the x-axis and COMMON_LAW dummy on the y-axis.

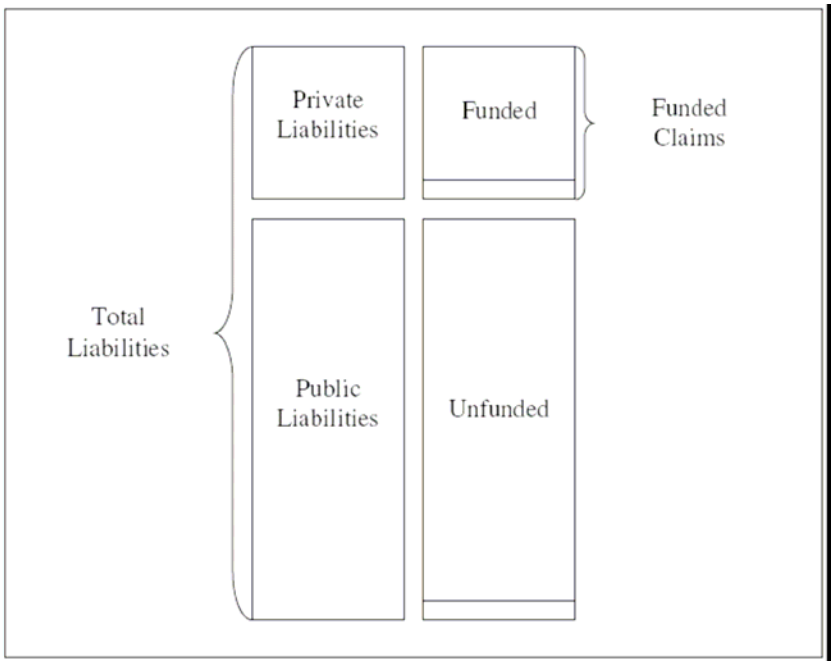

Figure 3 illustrates the idea of using funded pension assets to extract a measure of the percentage reliance on private pension liabilities, under the realistic assumption that private pensions are not too underfunded while state pensions are self funded.

Table 1: Development of Pension Systems in Various Countries

Country	Year of First Program	Year of First Major Program
Australia	1908	1941
Austria	1909	1935
Belgium	1900	1967
Canada	1927	1966
Denmark	1891	1964
Finland	1937	1956
France	1910	1945
Germany	1889	1949
Greece	1934	1978-85
Iceland	1909	1969-70
Ireland	1908	1952
Italy	1919	1969
Japan	1875	1942-44
South Korea	1960	1973
Mexico	1943-44	1943-44
Netherlands	1913	1957
New Zealand	1898	1938
Norway	1936	1936
Portugal	1919	1935
Spain	1919	1939
Sweden	1913	1962
Switzerland	1946	1946
United Kingdom	1908	1948
United States	1896	1935

NOTE: “Year of First Program” typically involves only a particular group of society (e.g., veterans, war widows, miners). “Year of First Major Program” is based on programs involving "large coverage" of private sector. Main sources of information are: Flora (1987a, 1987b) (for various European countries), the U.S. Social Security Administration (on: Social Security Programs Throughout the World), the Australian Bureau of Statistics, the Financial Report on the Public Pension Plan System (Japan) and the French Observatory of Retirement.

Table 2: Summary Statistics and Correlation Matrix

Panel A: Summary Statistics

Variables	Mean	Median	Minimum	Maximum	Standard Deviation	Nbr. Obs.
PENSION+LIFE	61.63	54.10	0.00	153.20	46.32	24
PENSION	34.31	12.00	0.00	111.90	38.92	24
SHOCK Dummy	0.250	0.000	0.000	1.000	0.442	24
HIGH_INFLATION Dummy	0.625	1.000	0.000	1.000	0.495	24
MAX_CPI	173.9	52.6	13.1	491.6	201.7	22
COMMON_LAW Dummy	0.250	0.000	0.000	1.000	0.442	24
CRASH1929	64.8	65.0	39.4	86.2	14.3	16
MARKET_CAP	0.723	0.436	0.146	2.044	0.572	22
NON-DEMOCRACY Dummy	0.167	0.000	0.000	1.000	0.381	24
POP1950_65+	0.087	0.089	0.035	0.122	0.023	24
POP2004_65+	0.147	0.155	0.055	0.191	0.034	24
STOCK_RETURNS	3.129	3.020	-0.120	5.880	1.773	23

Panel B: Correlation Matrix

	(1)	(2)	(3)	(4)	(5)	(6)
(1) PENSION+LIFE	1					
(2) PENSION	0.938 ***	1				
(3) SHOCK Dummy	-0.559 ***	-0.472 **	1			
(4) HIGH_INFLATION Dummy	-0.621 ***	-0.628 ***	0.447 **	1		
(5) COMMON_LAW Dummy	0.268	0.336	-0.333	-0.745 ***	1	
(6) MARKET_CAP	0.648 ***	0.657 ***	-0.445 **	-0.395 *	0.186	1

NOTE: All the variables are defined in Section 3. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 3: The Political Choice of Pension System

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
						Countries without the Largest Shocks (SHOCK = 0 subsample)			
SHOCK	-58.52 ***	-36.83 ***			-36.83 **	NA	NA	NA	NA
	(11.58)	(13.70)			(14.04)				
HIGH_INFLATION		-43.38 **			-73.87 ***	-43.38 **		-73.87 ***	
		(18.68)			(21.29)	(18.53)		(21.29)	
MAX_CPI			-0.15 ***						-0.189 *
			(0.028)						(0.090)
COMMON_LAW				28.10	-45.73 *		9.67	-45.73 *	-12.143
				(18.36)	(22.52)		(20.38)	(22.52)	(24.500)
Nbr. of Obs.	24	24	22	24	24	18	18	18	16
R-squared	31%	48%	45%	7%	57%	26%	1%	38%	10%
Adj. R-squared	28%	43%	42%	3%	50%	21%	X	30%	X

NOTE: The dependent variable is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. MAX_CPI gives the highest annual percentage increase in CPI in the years prior to each country's first major pension program. COMMON_LAW is a dummy variable equal to one if the country is a common law country, and zero otherwise. Regressions (6) – (9) are for the subsample SHOCK = 0. Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 4: Alternative Definitions of Pension Funding

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Funded Pension Assets, excluding Life Insurance Reserves				Percentage of Funded Pension Assets (PENSION+LIFE) from Total Liabilities			
SHOCK	-41.55 ***		-35.67 ***	-21.07 *	-0.23 ***		-0.17 ***	-0.12 *
	(9.58)		(13.16)	(12.14)	(0.06)		(0.06)	(0.07)
HIGH_INFLATION		-49.38 ***		-58.38 **		-0.316 ***		-0.19 **
		(13.610)		(26.49)		(0.079)		(0.07)
COMMON_LAW			17.65	-26.13			0.16 **	0.02
			(17.37)	(26.29)			(0.08)	(0.09)
Nbr. of Obs.	24	24	24	24	24	24	24	24
R-squared	22%	39%	27%	48%	29%	51%	43%	53%
Adj. R-squared	19%	37%	19%	40%	26%	49%	38%	46%

NOTE: In Regressions (1) – (4), the dependent variable is the percentage of funded pension assets over GDP in 2004, excluding Life Insurance assets (PENSION). In Regressions (5) – (8), the dependent variable is the percentage of funded pension liabilities/assets (PENSION+LIFE) from total liabilities, i.e., funded liabilities and unfunded public pension liabilities (defined as 20 times old age social expenditures) in 2004. All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. COMMON_LAW is a dummy variable equal to one if the country is a common law country, and zero otherwise. Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 5: The Effect of Demographics on Pension Funding

Variables	(1)	(2)	(3)	(4)	(5)	(6)
SHOCK				-37.24 **	-35.07 **	-33.09 **
				(17.42)	(16.30)	(16.07)
HIGH_INFLATION				-42.80 *	-43.50 **	-44.32 **
				(22.54)	(19.28)	(18.81)
POP2004_65+	-172.09			-20.44		
	(341.43)			(236.55)		
POP1950_65+		499.64 *			77.60	
		(266.11)			(170.89)	
POP1950_Young			-177.75			-81.68
			(127.72)			(118.97)
Nbr. of Obs.	24	24	24	24	24	24
R-squared	2%	6%	5%	48%	49%	49%
Adj. R-squared	X	2%	1%	41%	41%	42%

NOTE: The dependent variable is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. The variable POP2004_65+ measures for the proportion of the total population over 65 years old in 2004, while POP1950_65+ is the same value but for 1950 (or earliest date available). The variable POP1950_Young gives the proportion of total population older than 14 years that is in the age tranche 15-34 in 1950 (or earliest date available). Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 6: Alternative Political Explanations of Pension Funding

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
									Excluding Non-Democracies (NON-DEMOCRACY = 0 Subsample)	
SHOCK		-40.03 ***	-23.96 ***		-52.48 ***	-36.35 **	-50.07 ***	-33.95 ***	-63.21 ***	44-14 ***
		(9.82)	(8.41)		(14.84)	(14.60)	(11.89)	(12.64)	(12.44)	(15.94)
HIGH_INFLATION			-42.72 ***			-41.94 *		-37.61 *		-33.90
			(13.69)			(22.42)		(19.30)		(20.04)
Income Inequality (Gini Coefficient)	-2.70 ***	-1.91 **	-0.983 *							
	(0.953)	(0.910)	(0.542)							
Majoritarian Electoral Rule Dummy				38.32 **	21.74	4.33				
				(15.07)	(17.45)	(18.77)				
NON-DEMOCRACY Dummy							-38.05 ***	-25.96 **	NA	NA
							(13.65)	(11.51)		
Nbr. of Obs.	21	21	21	24	24	24	24	24	20	20
R-squared	25%	43%	63%	12%	35%	49%	40%	52%	32%	44%
Adj. R-squared	21%	36%	57%	8%	28%	41%	35%	45%	28%	37%

NOTE: The dependent variable is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. "Income Inequality" is measured as the Gini coefficient of income as provided by Forbes (2000) for the time period closest to the year of first major pension program. The variable "Majoritarian Electoral Rule" is a dummy variable equal to one if electoral rule is based on majority, and zero otherwise (Tabellini et al., 2003). The dummy variable NON-DEMOCRACY (i.e., countries that were not democratic at time of first major political decisions on pension system were made) equals one for South Korea, Mexico, Portugal and Spain. Regressions (7) – (9) are for the subsample SHOCK = 0. Regressions (11) and (12) are for the subsample NON-DEMOCRACY = 0. Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 7: Possible Alternative Explanations

Variables	(1)	(2)	(3)	(4)	(5)	(6)
SHOCK	-57.98 ***	-29.38 **	-54.63 ***	-61.66 ***	-59.44 ***	-57.13 ***
	(13.26)	(12.88)	(12.99)	(13.23)	(13.16)	(11.02)
MARKET_CAP_1913	8.5					
	(38.89)					
Current MARKET_CAP		42.64 **				
		(17.57)				
CRASH1929			0.16			
			(0.624)			
STOCK_RETURNS				6.85		
				(4.30)		
Average Inflation 1901-1945					-5.58 **	
					(2.54)	
Average Inflation 1920-1945						-3.77 *
						(2.16)
Nbr. of Obs.	15	22	16	23	15	21
R-squared	33%	48%	25%	39%	39%	42%
Adj. R-squared	x	42%	14%	32%	28%	35%

NOTE: The dependent variable is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The variable MARKET_CAP_1913 gives the market capitalization of the country's stock markets in 1913. The variable Current MARKET_CAP gives the market capitalization of the country's stock markets in 2002. The variables "Average Inflation 1901-1945" and "Average Inflation 1920-1945" give the average annual percentage change of CPI for their respective time period. For the calculation of average inflations, periods of "very high" inflation have been excluded (see Section 3 for more details). Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 8: The Effect of Culture on Pension Funding

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
SHOCK		-35.876 ***	-51.416 **		-23.655 ***			-54.69 ***	-34.481 ***
		(8.638)	(19.304)		(6.648)			(12.80)	(12.860)
HIGH_INFLATION				-54.363 ***	-46.669 **	9.136			-41.994 **
				(19.641)	(19.519)	(38.017)			(18.874)
Uncertainty Aversion (UA)	-1.083 ***	-0.813 ***	-0.838 ***	-0.338	-0.265	0.790			
	(0.196)	(-0.179)	(0.208)	(0.2445)	(0.215)	(0.991)			
SHOCK * UA			0.198						
			(0.218)						
HIGH_INFLATION * UA						-1.303			
						(1.006)			
% Catholics							-0.375 *	-0.24	-0.190
							(0.213)	(0.21)	(0.177)
Nbr. of Obs.	23	23	23	23	23	23	24	24	24
R-squared	38%	49%	49%	58%	63%	62%	8%	34%	50%
Adj. R-squared	35%	44%	41%	54%	57%	56%	4%	28%	43%

NOTE: The dependent variable is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. The variable "Uncertainty Aversion" is an indicator of uncertainty aversion as defined by Hofstede (1980). The Variable "% Catholics" gives the percentage of total population that is catholic (data provided by Tabellini et al., 2003). Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 9: Effect of War Damage and Political System on Inflationary Shock

Variables	Dependent Variable = SHOCK			Dependent Variable = MAX_CPI		
	(1)	(2)	(3)	(4)	(5)	(6)
War Destruction	0.984 ***	0.960 ***	2.162 **	132.9 ***	116.1 **	111.1 *
	(0.266)	(0.302)	(1.054)	(30.887)	(43.623)	(62.433)
Polity2 Variable		-0.060	0.109		-7.069	-8.016
		(0.055)	(0.136)		(9.946)	(15.761)
Polity2 Variable * War Destruction (Interactive Term)			-0.154			0.762
			(0.110)			(7.620)
Nbr. of Obs.	24	23	23	22	21	21
Wald Chi-squared	13.70 ***	8.70 ***	13.50 ***			
R-squared				42%	44%	44%
Pseudo R-squared	32%	33%	37%			

NOTE: All the estimations are done by Probit regressions. For Regressions (1) – (3), the dependent variable is the dummy variable SHOCK that is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. For Regressions (4) – (6), the dependent variable is MAX_CPI, which gives the highest annual percentage increase in CPI in the years prior to each country's first major pension program. The "War Destruction" variable is an index of three different dummy variables: Invasion (equal to one if the country got invaded during the war prior to the inflationary shock or civil war; for countries that did not experience a shock, we use WW1 as default), Intensity of Fighting (equal to one if the country had intensive fighting on its own territory during the war prior to the inflationary shock or civil war; for countries that did not experience a shock, we use WW1 as default) and Major Loss in Territory (equal to one if the country had important losses of territory from the war prior to the inflationary shock or civil war; for countries that did not experience a shock, we use WW1 as default). The variable "Polity2" (as defined by Polity IV) measures the quality of the political system in each country (within interval -10 to +10) at the time of the inflationary shock or highest inflation (year of MAX_CPI). Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.

Table 10: The Political Choice of Pension System (Two-Step Regression)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
SHOCK (IV)	-93.386 ***			-92.403 *		
	(32.728)			(50.196)		
HIGH_INFLATION (IV)		-73.497 ***			-100.170 ***	
		(18.043)			(31.550)	
MAX_CPI (IV)			-0.191 ***			-0.237 **
			(0.053)			(0.097)
COMMON_LAW				0.875	-49.005	-22.778
				(28.220)	(31.200)	(31.573)
Nbr. of Obs.	23	23	21	23	23	21
R-squared	15%	56%	42%	16%	66%	34%
Adj. R-squared	11%	54%	39%	8%	63%	26%

NOTE: All the regressions are two-step regressions. Only results of the second-stage regression are shown. The dependent variable in the second regression is the percentage of funded pension and life insurance assets over GDP in 2004 (PENSION+LIFE). All the regressions include a constant, whose coefficient is not reported. The dummy variable SHOCK is equal to one if the country experienced an increase in its Consumer Price Index (CPI) of 400% or more in a single year, and zero otherwise. The dummy variable HIGH_INFLATION is equal to one if the country experienced an increase in CPI of 30% or more in a single year, and zero otherwise. MAX_CPI gives the highest annual percentage increase in CPI in the years prior to each country's first major pension program. COMMON_LAW is a dummy variable equal to one if the country is a common law country, and zero otherwise. As instrumental variables for the first-step regression, we use WAR and Polity2 (as defined in Table 7). Robust standard errors are in parentheses. Significance levels: *** for 1%, ** for 5%, and * for 10%.