The Birth and Growth of the Social-Insurance State: Explaining Old-Age and Medical Insurance Across Countries

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Abstract

We seek to explain why countries have adopted national Old-Age Insurance and Health Insurance programs. Theoretical work has posited several factors that could lead to this adoption: the strain from expanding capitalism; the need for political legitimacy; the desire to transfer to similar people; increased wealth; and the outcome of leviathan government. We relate the probability of a country's creating social insurance to proxies for each of these theories. We find weak evidence that the probability of adopting a system declines with increases in wealth and with greater ethnic heterogeneity. Still, none of the theories is very strongly related to system adoption. We conclude that social insurance can be politically expedient for many different reasons.

1. Introduction

The most dramatic change in the public sector in the twentieth century was the birth and growth of the social-insurance state. In 1900, two countries (Germany and Austria) had modest old-age and medical-care programs for the middle class, created up to twenty years before. Today, old-age programs and universal medical-care programs are the hallmark of developed countries. These programs are big and durable, accounting for 10 to 15 percent of GDP. As several countries have shown in recent years, changing these programs is politically problematic.[1] And these major social programs are surrounded by a series of more minor ones, ranging from insurance for unemployed workers, cash and medical payments for people disabled at work, and cash payments for those whose earnings are temporarily low.

This twentieth-century experience raises profound questions: why were these social-insurance programs created? And why did different countries create different types of system? We take up these issues in this paper. There are many economic and political science theories for the birth of social insurance. Those we present are thus not of our own creation, but largely distil other writers' suggestions, for example Peacock and Wiseman (1961) on the effect of wars, Pelzman (1980) on that of income equality, and Flora and Alber (1981) on that of monarchy.

We group theories about social insurance into five categories. The *ravages of capitalism* theory argues that social insurance was born in the brutishness of capitalist life; as economic life became less stable, social insurance created a needed safety net. The *political legitimacy* theory argues that social insurance was created to legitimize non-elected governments, by giving people

a stake in the continuation of the state. *Wagner's Law* posits that social insurance is a luxury good; as income raises, countries want to minimize their exposure to extreme poverty. The *demographic heterogeneity* theory argues that social insurance is a transfer program created for like people; in more homogeneous countries the willingness to institute such programs will be greater. The *Leviathan* theory argues that social insurance is created when governments have excess revenue, most commonly at the end of wars.

Our empirical work tests which of these theories best explains the creation of major social insurance programs. In our sample of twenty developed countries, all have old-age and health-insurance systems. We estimate hazard models for the creation of these systems, and test which factors made countries faster or slower to adopt social insurance.[2]

We find the most evidence for a negative effect of the level of per capita GDP, that is, the opposite of Wagner's Law. This reflects the fact that some of the richer countries in our sample were particularly late in adopting social-insurance institutions, such as the United States. Our interpretation is that in richer countries, where private capital markets are more developed, there is less need for and greater private opposition to the introduction of state insurance systems. We also find that ethnically-heterogeneous countries are slower to adopt insurance systems. This is consistent with the theory that diverse populations are more suspicious of programs with potentially redistributive effects. Finally, we find evidence that Catholic countries are more likely to adopt insurance-based old age support systems and less likely to adopt means-tested systems.

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[1] Juppé's French (1995) and Prodi's Italian government (1998) collapsed under opposition to pension reforms.
[2] Lindert (1994) examines the growth of social transfer spending from 1880 to 1930. We believe dates of system

Still, the overall impact of these variables on system adoption is relatively weak. The estimates differ quantitatively and qualitatively across specifications, depending on the controls we include. We conclude that there are many plausible reasons for the adoption of social insurance systems, and that different factors might be relevant in different countries.

This paper is organized as follows. Section 2 provides an overview of social-insurance programs and their growth in the past century. Section 3 expands on the theories of the creation of social-insurance systems. Section 4 describes the data sets we use to test these theories and summarizes historical evidence on them. Section 5 presents evidence from estimated hazard models. Section 6 concludes.

2.   The Social-Insurance State

The first social-insurance system was created in Germany in the 1880s. It consisted of Accident Insurance, Sickness Insurance and, jointly, Invalidity and Old-Age Insurance, and covered, by 1925, two-thirds of the labour force, most of them blue-collar workers. Since then, social insurance has spread to all developed countries and has grown remarkably in size.

Old-Age Insurance (OAI) is many countries' largest social insurance program. OAI is a set of income transfers to elderly people, sometimes associated with being out of the labor force but frequently conditioned only on age. We distinguish between two fundamental types of OAI

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adoption are more reliable left-hand side data than the redistributive component of government spending.

system.[3] *Insurance systems* are those in which benefits are earnings-related. The primary justifications for such systems are insurance against longevity, failures in financial institutions, or individuals' myopia. Examples include Bismarck's original OAI in Germany and the United States' OASI. *Minimum systems* are those in which benefits are either means-tested or set at a flat rate, and thus are designed more as welfare systems, protecting against destitution among the elderly. We describe the UK's system, with flat-rate benefits for qualified retirees, as a minimum system. Holzmann in OECD (1988) attempts to distinguish a third class of 'mixed' systems, which include both a guaranteed minimum benefit and earnings-related benefits. This distinction is problematic since every insurance system guarantees some minimum benefit. We thus classify all systems where benefits increase with marginal contributions as insurance systems.

Table 1 gives some evidence on the size of OAI programs. Our sample is seventeen developed countries. The first row shows that OAI programs[4] are sizeable. In 1995, OAI was 11.1 percent of GDP in the average developed country. These programs vary considerably in size, however. In 1995, the standard deviation of OAI as a percentage of GDP was 3.8. The second row shows that OAI has increased rapidly as a share of GDP, and that the growth rate of OAI has differed greatly across countries. Between 1960 and 1995, the mean increase in OAI as a share of GDP was 6.7 percent, with a standard deviation of 3 percent. Rows three and four show that OAI is a large and increasing share of total government expenditure.

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[3] Some writers distinguish between contributory and non-contributory systems (for example, Williamson and Pampel (1993)), but the distinction between earmarked and non-earmarked contributions seems minor. It would be interesting to distinguish between funded and unfunded systems, but all the systems we analyze are unfunded. The distinction between insurance and minimum systems is similar to Esping-Andersen's (1990) distinction between 'liberal' and 'corporatist' systems.

[4] Our OAI spending data are from the OECD Social Expenditure Database, and include Old-Age cash benefits, survivors benefits, disability benefits, and services to the elderly and disabled.

The differential sizes of OAI systems are not simply determined by demographics. Figure 1 shows the relation between the size of OAI in GDP in 1995 and the share of the population over age 65.[5] While the regression line is positively-sloped (β=1.65, t_{19}=5.57), the fit is imperfect (R^2=0.62).[6] Particular outliers are Austria, where the state pension ages of 55 for women and 60 result in high spending conditional on demographics, and Japan, which paid few old age insurance benefits until the 1960s.

The fifth and seventh rows of Table 1 show that insurance systems are generally larger than minimum systems. In 1995 the average insurance system in our sample consumed 11.9 percent of GDP, while the average minimum system consumed 8.5 percent. The sixth and eighth rows show that insurance systems have grown more rapidly than minimum systems over the past few decades. Looking only at the systems which have remained the same type since 1960, the average growth in percentage points of GDP consumed is 6.8 for insurance systems and 5.1 for minimum systems. Systems which paid flat-rate benefits in 1960 but then added an earnings-related component might be expected to have grown the fastest of all. Column nine shows that, indeed, these 'switching systems' added 8.2 percentage points of GDP between 1960 and 1995. The extremes of the growth experience are Finland and Australia: Finland's pension spending grew by 11.2 percentage points of GDP between 1960 and 1995, Australia's by only 1.7 percentage points.

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[5] Here data are used from the seventeen countries in Table 1, plus New Zealand, Portugal and Spain, for which OECD (1997) lacks government expenditure data for 1960.

[6] There are twenty countries in figures 1 and 2, which refer to 1995, but only seventeen in table 1, which refer to some changes between 1960 and 1995, because of missing data for 1960.

Institutional variation is even greater in health insurance. National Health Insurance (NHI) has been adopted in all the countries in our sample, given that we interpret US Medicare as an NHI system, and Switzerland introduced compulsory health insurance in 1994. Because NHI is a service and not just an income transfer, the variation in arrangements across countries is greater than for OAI. For example, Britain, Italy and Spain have systems where physicians are state employees, while other countries have private providers with only a contractual relationship with the government. The last four rows in Table 1 show information on the size of NHI programs. NHI programs increased from 2.4 percent of GDP in 1960 to 6.2 percent of GDP in 1995. This 3.8-point average growth has a large standard deviation, however, of 1.3 percentage points of GDP. As figure 2 shows, the size of medical spending is only loosely related to the size of the aged population. The regression line in figure 2 is barely upward-sloping (β=0.06, t_{19}=0.47), and the R^2 is only 0.01. Thus, more than just demographics explain the variation in medical spending across countries.

3.   Theories of the Birth and Growth of Social Insurance

The economic and political science literatures have advanced a number of (often contradictory) theories for the birth and growth of OAI and NHI. We group the theories into five categories:

Ravages of Capitalism. This theory stresses the role that capitalism plays in encouraging development of social insurance systems. Life in cities can be more difficult than life in

agricultural settings, as the distinction between employment and unemployment becomes sharper. Recessions are also more prevalent in capitalist societies, leading to increased periods without income. Further, extended families may be less likely to live together in cities. Thus, one might expect that social insurance would develop more rapidly in capitalist systems.

The idea that insurance becomes necessary in capitalist economies is evident in the rhetoric used by Franklin Roosevelt to justify the US Social Security Act.[7] Earlier British pension campaigners had argued that capitalist production created a new problem of 'worn-out industrial workers'. MacNicol (1998) cites a British pro-OAI pamphlet of 1900 entitled *The Worn-Out Workman: What is to be Done With Him?*.[8] The US adoption of Social Security in 1935 may be interpreted as supporting this theory: both Weaver (1982) and Miron and Weil (1998) argue that the Depression was necessary for Roosevelt to pass the SSA. However, the Bismarckian format of US OAI does not reflect these Depression origins: Weaver argues that means-tested Old Age Assistance was the more popular component of the 1935 Act. The Townsend pension plan, and Huey Long's 'Share the Wealth' pension plan, each popular in the early 1930s, both proposed flat-rate pensions conditional on retirement at 60.[9]

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[7] For example, Roosevelt's *Message of the President to Congress*, June 8, 1934: "Security was attained in the earlier days through the interdependence of members of families upon each other and of the families within a small community upon each other. The complexities of great communities and of organized industry make less real these simple means of security. Therefore, we are compelled to employ the active interest of the Nation as a whole through government in order to encourage a greater security for each individual who composes it."
[8] MacNicol (1998) p.142; this pamphlet was published by the 'National Committee of Organised Labour for Promoting Old Age Pensions for All'.
[9] The Social Security Administration's website, at http://www.ssa.gov/history/history.html, provides detail on both the Townsend and Long plans. Long, in a 1934 speech to the Senate (also linked on this site), justified his pension plan primarily as a means to remove older workers from the labour force. As Miron and Weil (1998) note, Social Security initially reflected this aim, making benefits conditional on complete retirement. Retirement or earnings tests for Social Security benefits have since been progressively reduced.

Political Legitimacy Theory. This theory posits that countries in which the executive is

not elected, or in which for other reasons the State lacks legitimacy, will be the first to introduce

social insurance programs. In this theory, OAI and NHI are intended to dissipate political

opposition and to give important societal groups an interest in the continuity of the State. This

theory was posited most strongly by Flora and Alber (1981).

The evidence most commonly cited for this theory is the birth of social insurance in

Germany. Bismarck wrote as early as 1871 that "The only means of stopping the Socialist

movement in its present state of confusion is to put into effect those Socialist demands which

seem justified and which can be realized within the framework of the present order of state and

society."[10] Bismarck's social legislation followed his anti-Socialist bill of 1878 which, following

assassination attempts on the Kaiser, dissolved socialist parties, banned publications and

detained or deported several thousand people. Thus social insurance was explicitly justified as a

second method of combating dissent. Flora and Alber see Bismarck's need to legitimize the new

German 'order of state and society' as having been particularly acute because neither the Kaiser

nor the chancellor were elected, and because the German state created in 1870 failed to include

Austria, which some considered part of 'greater Germany'. That the German Social Democratic

Party supported the war effort in 1914 is seen as a victory for Bismarck's policy of binding

industrial workers to the Second Reich. Somewhat similarly, Mesa-Lago (1978) describes

Argentina's semi-military leader Juan Perón's creation of OAI (in 1946) as cementing an

alliance between his regime and influential industrial unions. A corollary of this theory is that

non-democratic countries will create systems similar to insurance schemes rather than

introducing means-tested benefits. This would occur since insurance systems affect politically

important blue-collar workers, not just the indigent, and because they give workers more sense that 'the State has their money', and thus an interest in the State's survival.

Olson (1982) posits a theory somewhat contradictory to the 'political legitimacy' theory. Olson argues that social insurance institutions reflect the desire of the poor for redistribution, and thus that democracies will create them before non-democratic governments. Olson's theory is similar to the political legitimacy theory, however, in predicting that democracies are more likely to introduce redistributive, minimum insurance systems than are non-democracies.

Wagner's Law. The third theory is that social insurance is a luxury good created when countries get rich enough. The theory stems from Wagner's hypothesis (1892) that income growth explains the growth of government in general. Income effects might work through several mechanisms. The direct effect is the demand for poverty relief in wealthier countries. There is a potential indirect effect if OAI or NHI later becomes a constraint on growth. In such a case, we might expect social insurance to be reduced in periods of low growth.

Income effects might be seen in the birth of the British and Australian OAI systems in 1908. According to Maddison's historical series, in 1900 only the US had a higher per-capita GDP than these two countries. Both countries adopted redistributive systems financed by general revenue in 1908, which could reflect a 'taste for redistribution' which increases with wealth.

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[10] Zöllner (1982), p.13.

Demographic Heterogeneity. Heterogeneity theories emphasize that government programs with redistributive effects will be slower to emerge in countries with ethnically, linguistically, or religiously-divided populations. Easterly and Levine (1997) argue this theory helps explain government spending across countries, and Alesina, Baqir and Easterly (1999) argue it helps explain variation in local government's spending across the US.

Evidence on the importance of demographic heterogeneity is frequently found in the relatively slow development of social insurance in the US. As Table 2 shows, by 1935, when the Social Security Act was passed, the US was a relative laggard in the construction of OAI. Canada's federal structure, arguably itself a product of its heterogeneity, delayed its introduction of OAI, and since 1965 Quebec and the rest of Canada have had separate earnings-related OAI schemes.

A separate demographic theory is that, since unfunded OAI immediately benefits the elderly, the birth and growth of OAI will be related to the share of the elderly in the population and thus their political power. Indeed, not only current retirees but also near retirees would favour the creation of an unfunded pension system.[11] It is certainly folklore in the United States that as the elderly share of the population grows, it will become increasingly difficult to cut back on transfers to that group[12].

Leviathan Theory. The Leviathan theory stresses that social insurance programs are created to expand the range of government as much as possible. The key constraint on the

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[11] Browning (1975) shows that, facing disproportionately low contributions for similar benefits, middle-aged workers will desire a bigger pay-as-you-go system than will the young.

growth of government is not the need for social insurance but the ability of government to get the revenues necessary to pay for it. Such revenues are most commonly available after they are no longer needed for other purposes, since they do not require new taxes.

British pension policy following the Boer and World Wars suggests such an interpretation. Peacock and Wiseman (1961) note that during each of these wars British government expenditures spiked upwards and fell only slightly afterwards.[13] These wars' ends in 1902, 1918 and 1945 shortly predate the creation of British old-age pensions (1908), their expansion from 70 to 65-year-olds (1925), and the abandonment of the means test (1948). Peacock and Wiseman argue for the path-dependence of tax rates, noting that "experience obtained during World War I in the techniques and administrative problems of assessing lower income groups for income tax provided the foundation for the permanent extension of that tax. [During World War II] the purchase tax was first introduced - as a "temporary" expedient - and the revenue-raising potentialities of the tobacco tax came to be fully appreciated." The Boer War was also a stimulant to the creation of British Health Insurance (1911) as the poor health of conscripts revealed the squalid conditions of contemporary working-class life.[14] The development of Japanese Health Insurance from 1927 onwards is also often connected with a desire to improve the health of conscripts.[15]

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[12] For example, see Peterson and Howe, (1988), p.19-20 on the strength of the US 'gray' lobby.
[13] This upward step remains after increased debt interest payments are subtracted from government spending (Peacock and Wiseman p.58). Wagner made a similar argument.
[14] In 1900 army doctors rejected for military service eleven of every twelve men in East London (Eder 1982 p.5).
[15] Nishimura and Yoshikawa, (1993) write that "...as Japan moved toward entry into the pacific War, the extension of health coverage was couched in the rationale of "Healthy People, Healthy Soldiers"."

Demonstration Effects. We also allow for the potential that countries mimic their neighbours' social insurance programs. Many countries introduced close copies of the German system, and others had them imposed after German invasions. There is a commonality to social insurance programs in former Commonwealth countries as well. Given this history, and the observation that countries with linguistic or political links introduced similar types of system, it may be that cross-country demonstration effects are more important than conditions within countries. We test this as well in our empirical work.

We use historical data on the timing of the introduction of OAI and NHI systems to estimate why different countries adopted social insurance systems when they did. We describe these results in the next two sections.

4.   **The Birth of Social Insurance**

To analyze the factors influencing the birth of social-insurance systems, we have gathered data on the adoption of OAI and NHI systems and major system changes in 20 OECD and Latin American countries. This sample is common to many studies of the size of the public sector. Further, it includes countries at roughly equal levels of development.[16]

For each of these countries, we have read as many historical accounts as possible of the development of OAI and NHI. These histories and the dates of introduction are summarized in Tables 2 (Old-Age Insurance) and 3 (Health Insurance).

The first system in Table 2 is the German Old-Age and Disability Insurance legislated in

1889 and first paying benefits in 1891. Though this system had important precursors in France[17]

and Prussia[18], both responses to the European revolutions of 1848, Bismarck's system was the

first compulsorily to insure substantial numbers of workers. His system was compulsory for

lower-income blue-collar workers only, and was financed by employer, employee and state

contributions. Both contributions and benefits were income-related, requiring that employers

keep files on their workers' contribution histories. In this period the administration of such a

system represented a bureaucratic achievement beyond the capabilities of many states.[19] In 1891

11.5 million workers were insured, of a total population of 49 million.[20] The income threshold

below which insurance was compulsory was successively raised, and in 1911 a separate but

similar scheme was set up for white-collar employees. In 1925, out of a total workforce of 32

million and population of 62 million, 17.5 million were insured in the workers' scheme, 2.8

million in the white collars' scheme, and 875,000 in a separate miners' insurance scheme. Thus

fairly quickly German Old-Age and Disability Insurance covered a substantial proportion of the

population, though rural workers were excluded until 1957.

The German lead, though much studied elsewhere, was followed by rather dissimilar OAI

systems: Denmark and New Zealand introduced universal means-tested systems, in 1891 and

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[16] The countries are the seventeen listed in the note to Table 1, plus New Zealand, Spain and Portugal.

[17] Bismarck was influenced by the French system of subsidised voluntary pensions created in 1850 following the revolution of 1848, and encouraged by Emperor Napoleon III. Thus Bismarck to the Reichstag, during the 1889 debate on the Old-Age and Disability bill, "I have lived in France long enough to know that the faithfulness of most of the French to their government...is largely connected with the fact that most of the French receive a state pension.", Zöllner in Köhler et. al., (1982) p.13.

[18] See Ritter (1983) p.20-3 on the Prussian legislation of the 1850s.

[19] Hennock (1987) describes the British view of the German system.

[20] Ritter (1983) Table 3 p.191 estimates coverage rates; the figures for 1925 are from the German Statistical

1898 respectively, financed from general revenues. These were both wealthy agricultural countries, and Petersen (1990) argues that the desire to relieve rural poverty influenced the Danish choice of such a system. Britain (and thus Ireland) and Australia also introduced means-tested pensions in 1908. Pensions in Britain were payable at 70, and in New Zealand and Australia at 65. The Australian national system followed the deep recession it had experienced during the 1890s.[21] British private mutual societies resisted state pensions in the nineteenth century but, suffering from solvency problems due to over-estimates of mortality, did not resist them after the Boer war. Particularly in Ireland, the pensions means-test was soon more laxly applied than had been envisioned, a process common among countries which began with such restrictive systems.[22] The means-tested systems in the Commonwealth countries were closer to pre-existing Poor Law provision than Bismarckian social insurance. However, their size and the weaker conditions attached to their receipt marked a substantial departure from the principles of the Poor Law.[23]

Policymakers in the Scandinavian countries had been attentive to the German OAI legislation, yet the Scandinavian systems followed, before World War II, the Danish example more closely. Sweden introduced a universal earnings-related system in 1913, but this was soon overshadowed in size by additional means-tested benefits. By 1939 Norway and Finland also had means-tested systems, as, following the other Commonwealth countries, did Canada.

Yearbook.

[21] Castles (1985), p.57-8 speculates on the importance of this recession to Australia's adoption of Old-Age Pensions in 1908.

[22] Gilbert (1966).

[23] A Poor Law had existed in England since 1601. Bruce (1961), p.156, notes that, in contrast to previous kinds of poor relief, British Old-Age Pensions after 1908 did not require the recipients' disqualification from voting.

Many countries in continental Europe adopted contributory OAI systems compulsory for urban workers with salaries below a specified limit between the World Wars. Thus the Belgian, Italian, French and Austrian schemes were all similar to Bismarck's. Inter-war French governments were provoked to introduce a social-insurance system partly because, having repossessed Alsace and Lorraine from Germany in 1919, they thought continuing the popular insurance systems there necessary, and thought it anomalous that only some regions in the country should have compulsory insurance.[24] The Italian, Belgian and French systems were all reorganised and extended after World War II, though they retained their earnings-related structure. The Spanish and Portuguese systems remained very small until the advent of democracy in these countries in the 1970s. US Social Security developed much as the 1935 Act specified [25], though the benefit increases included in the 1939 amendments ensured that the planned large Trust Fund did not materialize. Only in 1950 did earnings-related Old Age Insurance benefits first exceed means-tested Old Age Assistance, part of the 1935 act, which was intended specifically to alleviate the effects of the depression. The Japanese system created in 1942 paid few benefits and was restricted to employees. However, as can be seen in the case of health care, Japanese governments before 1945 enthusiastically implemented Bismarckian social insurance programs. In 1961 a universal flat-rate pension was introduced to cover the entire working population, but replacement rates remained low until they were sharply increased in 1974.[26]

The immediate post-war era saw new earnings-related OAI programs in Argentina and Switzerland, a flat-rate system created in the Netherlands, and many system expansions, which,

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[24] Immergut (1991), for example, makes this argument in the context of health insurance.
[25] This is the argument of Miron and Weil (1998).

as Pelzman (1980) notes, occurred in neutral as well as former combatant countries. A feature of OAI reform in this period was the abandonment of means-testing (in Sweden, Britain and Canada) amidst war-engendered desires for more universal systems typified by the British Beveridge Report of 1942.

Universal systems were politically limited, however, since raising the level of benefits was extremely costly. Many of the OAI reforms of the 1950s and 1960s either introduced (Canada, Norway, Finland and Sweden) or extended (Germany, Italy, France, the US and Austria) earnings-related systems, as a means of using politically-acceptable taxes to allow many of the elderly to share in the rapid post-war growth of incomes. The UK introduced an earnings-related system in 1978, but this was largely voluntary, since members of occupational schemes were allowed to opt out of it.[27] Table 2 thus suggests a certain type of institutional hysteresis in OAI systems: countries sometimes add an earnings-related system to existing minimum benefits, but they do not end such systems and move back to minimum systems. As can be seen from row seven of Table 1, those countries which added earnings-related systems to their minimum systems since 1960 have experienced particularly large growth in OAI spending.

Table 3 describes the history of Health Insurance systems in our sample. We date the creation of health insurance as being when coverage was made compulsory for a broad class of people, even if the related expenditures did not form part of a government budget. Bismarck's Germany was again in 1883 the first to introduce a compulsory system. As with Germany's OAI system, coverage was compulsory only for blue-collar workers earning less than a specified

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[26] See for example the time-series of replacement rates in Oshio and Yashiro (1997).
[27] This right originally extended only to members of defined-benefit pension schemes, but was extended to

limit, which was raised over time. The system provided both in-kind medical benefits and cash

payments in the event of sickness or pregnancy. By 1889 6.1 million German workers were

members of one of the component Sickness Funds, about twelve percent of the population[28]. As

with OAI, German Sickness Insurance was financed by a mixture of employer, employee and

general revenue contributions. Both contributions and benefits were graduated according to

workers' incomes. Benefits were restricted to the insured; for example, cash maternity benefits

were given only to insured women, not to the wives of insured men.[29] By 1925, over 18 million

workers were covered, a roughly comparable number to those insured under Old Age and

Disability Insurance.

Austria, Norway and Switzerland quickly introduced similar Health-Insurance legislation,

though this failed in Switzerland due to private-sector opposition.[30] The initial British response

was that German compulsory insurance necessitated unwonted bureaucracy and compulsion.

However, Prime Minister Lloyd George returned from a visit to Germany in 1908 convinced of

the success of the German system, and proceeded to design a comparable one. Like the German

scheme, British National (Health) Insurance, adopted in 1911, provided cash and in-kind benefits

and was compulsory only for manual workers, thereby covering around the same thirty percent

of the population as were covered in Germany.[31] The main difference between the two

countries' schemes were that mandatory contributions and benefits in Britain were uniform

across workers rather than income-related. Again imitating Germany, Japan's military-

dominated government introduced compulsory Health Insurance for various classes of industrial

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members of defined-contribution schemes in 1986.

[28] Ritter (1983), Table 1 has time series on the growth of German Sickness Insurance.

[29] Hennock (1987) p.183 cites this as a difference between German and British health Insurance in 1911.

[30] Immergut (1991).

workers in 1927. There was an income limit for compulsory insurance and an earnings-related contribution structure.[32] Health Insurance was extended on a voluntary basis to rural areas in 1938, and compulsorily to white collar workers and seamen in 1939. Thus by 1943, Japan had wide health insurance coverage,[33] though this system had to be rebuilt after 1945.

France adopted compulsory Health Insurance for low-income workers in 1930 at the same time as Old-Age Insurance, with, again, competition with Germany over the loyalty of Alsace and Lorraine a suggested reason. Danish private health insurance societies were subsidised and regulated by the state since at least 1892. In response to the Depression, four 'Social Reform Acts' were passed in 1933 strengthening Denmark's social insurance systems, and making the right to receive a government old-age pension conditional on being a member of an approved health insurance fund. Thus health insurance was essentially compulsory from this point on, although the state only explicitly took over the health insurers' functions in 1973.[34] Similarly, the New Zealand Social Security Act of 1938 introduced universal health benefits and means-tested sickness benefits in a context similar to that of the US Social Security Act. New Zealand's first government comprising only the Labour Party (1935-9) introduced many new measures in response to the perceived inadequacy of existing systems in the face of the Depression.[35]

A number of Health Insurance schemes were introduced in the 1940s, typically in the form of government compulsion to join, and government regulation of, the pre-existing system

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[31] Hennock p.182.
[32] Powell and Anesaki, 1990, p.36-7 give details of the 1927 scheme.
[33] Nishimura and Yoshikawa, 1993.
[34] See the chapter on Denmark in Maynard (1975), and Parkum (1972).

of private sickness funds. In the Netherlands, physicians had resisted plans for a Bismarckian

system proposed since 1904. As a concession to them, the government scheme introduced in

1930 made insurance only for sickness-related cash payments compulsory for low-income

workers. In 1941 the German occupying authorities imposed health insurance on the lines of

previously-written, though not-enacted, Dutch legislation. Insurance for benefits in kind was

made compulsory, and the income threshold below which coverage was compulsory raised

substantially. After liberation the Dutch system continued in the manner established by the

German authorities.[36] Franco's Spain introduced compulsory Sickness Insurance in 1942 for

lower-income industrial workers; initially this system covered only 25 per cent of the population,

but coverage was gradually extended after World War II.[37] Similarly Mussolini's Italian

government made membership of a sickness fund compulsory in 1943, and centralized and

imposed state control on these funds. All salaried people were compelled to contribute.[38]

Belgian mutual funds had long been subsidized by the state: after Belgium's liberation

employers and workers cooperated to construct a social security system which included

compulsory health insurance, at first with limited coverage. In Sweden, a network of largely free

public hospitals, financed by local taxes, made compulsory sickness insurance seem less urgent.

Thus, a kind of state health service existed before the Sickness Insurance Act of 1947, which

made membership of one of the voluntary insurance societies compulsory for employees.[39]

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[35] Mendelsohn, (1954), Ch. V.
[36] Blanpain et. al. (1978) describe the history of Dutch health insurance.
[37] Portella and Cuervo in DuPlessis, (1989).
[38] Hanao in DuPlessis, (1989).
[39] Blanpain et. al. (1978) note that tax-financed hospitals were set up in 1818 to treat soldiers with venereal diseases, and were retained thereafter to treat the civilian population.

The remaining countries in our sample all adopted compulsory health-insurance systems at more recent dates. The introduction of Bismarckian sickness insurance in Finland was prevented in the inter-war period by a strong Agrarian party, which did not want its supporters to pay for urban benefits. Sickness Insurance as introduced in 1962 covered the entire population.[40] In Argentina, Perón introduced health insurance for railroad workers in 1944, and health insurance also existed for the military and the judiciary before it was extended to all urban workers under the civilian president Illia in 1964.[41]

In the US, interest in federal financing of medical services dates back at least to the 1930s, though President Franklin Roosevelt kept plans for Health Insurance out of the Social Security Act so as not to impede the progress of the rest of the Act.[42] The 1950 Amendments to the Social Security Act authorized federal matching grants for state expenditures for medical costs of recipients of public assistance. President Truman proposed compulsory health insurance for the entire population as part of his 'Fair Deal' proposals of 1945. Truman's plan did not pass Congress, and is thus a counter-example to the theory that insurance schemes are introduced after wars. The Medicare Act of 1965 created compulsory insurance only for those over sixty-five. Canadian health insurance was seriously proposed in 1934, but failed in part due to a court ruling that the federal government did not have the power to introduce such systems. After World War II, the federal government subsidized the provinces' provision of hospital care, and, following the creation of provincial health insurance plans, passed the Medical Care Act of 1966,

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[40] Kangas, (1990).
[41] Mesa-Lago, (1978).
[42] David, (1985).

which offered to pay provinces half the cost of insurance plans meeting criteria such as universality.[43]

The cases of Australia and Switzerland show the slight differences between subsidized private and state health insurance systems. Attempts to introduce National Health Insurance in Australia by the Labour government of 1941-9 were successfully resisted by doctors concerned about restriction of their fees. Thereafter, a system of heavily-subsidised private care developed. Another Labour government passed the Medibank law of 1974, creating a levy and general-taxation-financed Health Insurance Fund from which all citizens were entitled to claim reimbursements for outpatient care, and which provided for free hospital treatment. Reforms introduced in 1976, however, allowed citizens the right to opt out of this levy by providing evidence of membership of an equally-generous private fund. Thus private insurance continued to coexist with heavily state-subsidised medial care.[44] In Switzerland, attempts to introduce compulsory health insurance from 1899 onwards were repeatedly frustrated by doctors and private-sector insurance funds.[45] A system of wide-scale though voluntary membership of subsidised private insurers evolved instead, until insurance for medical care was made compulsory in 1994.

Our rough conclusion from this historical evidence is that, while there is some support for each of the theories we have described, none seems to dominate the others, with counterexamples existing for any one theory.

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[43] Leatt and Williams in Raffel, (1997).
[44] Brown (1983) describes the Australian health system and its development.

Methodology

To examine these conclusions more systematically, we estimate hazard models for the introduction of social insurance. Denoting $X_{i,t}$ as the set of potentially time-varying factors that might explain system growth, we assume that:

$$\Pr\left[Adoption \quad in \quad t \middle| Does \quad not \quad adopt \quad prior \quad to \quad t\right] = \lambda_{1i,t} = \lambda_{0,t} \exp\left(X_{i,t}\beta\right)$$

If we denote the date of adoption A_i, then since

$$\Pr\left[A_t \geq t+1 \middle| A_t \geq t\right] = \exp\left[-\int_t^{t+1} \lambda_1(u)du\right] = \exp\left[-\exp\left(X_{i,t}\beta\right)\right]\int_t^{t+1} \lambda_0(u)du$$

the probability of any one country having adopted by date T is

$$1 - \prod_{t=1}^{T} \exp\left[-\exp\left\{X_{i,t} + \gamma_t\right\}\right], \qquad \text{where} \qquad \gamma_t = \ln\left\{\int_t^{t+1} \lambda_0(u)du\right\}.$$

If λ_1 is constant, the expected time until adoption is $1/\lambda_1$, though here because $\lambda_1(t)$ varies, the calculation of the expected adoption time is more complicated. Below we use $1/\lambda_1$ as a rough estimate of expected time until adoption. We estimate the baseline hazard $\lambda_0(t)$ semi-parametrically after Cox (1972), so as not to impose an arbitrary baseline time-pattern of adoptions.[46]

Our primary estimates pool the creation of any old-age insurance or national health-insurance program. Thus, the model contains 40 observations (20 countries for each type of system). We include a dummy variable for the type of system considered. We also estimate

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[45] Immergut (1992).
[46] This is analogous to using time dummies in a panel regression.

separate models for the adoption of means-tested and insurance (earnings-related) OAI systems, and that of NHI systems.

Not all social-insurance programs were created at once. France, for example, created an Old-Age Insurance system in 1930, but this remained small until after World War II, with around 6.4 million contributors, or 32 percent of the labour force, in 1936.[47] After the refounding of the system in 1946, spending and coverage grew rapidly, with 12.6 million contributors, 64 percent of the labour force, in 1955. Such a multi-phased introduction is hard to capture in a hazard model. We use the date of first introduction of a system in our analysis. We have experimented with other specifications that allow for multiple periods of creation, but the results did not differ significantly from those using the birth of a system of any size.[48]

Independent Variables

Our independent variables reflect the different theories we advanced above. Table 4 shows the variables that we use and the theories they proxy for. We also show summary statistics in 1900. The data are measured at decadal intervals, apart from the 'Ethnic' and 'Catholic' variables, which are only observed once per country.

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[47] See Reimat (1997), for details of the pre-1946 French system.
[48] In regressions using both creations and expansions of OAI as 'event dates', industrialization and Catholicism have positive effects, but none of the regressors are significant. Conceptually it is hard in some cases to decide which expansions were the most significant, which is a problem with estimating this model. The weak negative effect of the 'war' variable may be surprising, given the expansions in several countries around 1946, but there were also several expansions in the late 1950s (Germany, Italy, Finland, the Netherlands).

The 'Industry' variable is the proportion of a country's labour force that was employed in either manufacturing or extractive (mining) industry, or in construction, and refers to both sexes. The data used to construct this variable are taken from various editions of Mitchell's *Historical Statistics*. The 'Urbanization' variable is the percentage of a country's population living in cities with more than 100,00 occupants. Data for the European countries are taken from Flora (1983), for the US from *Historical Statistics of the United States*[49], and for other countries from censuses and statistical handbooks. The 'Recession' variable is constructed from Maddison's (1991) annual series for national GDP. Its value is the number of years in the preceding decade in which real GDP shrank. There are some missing observations due to gaps in Maddison's data.

The 'Non-democracy' variable records whether a country had a powerful non-elected ruler. Here we follow Flora and Alber as coding pre-1914 Austria, Germany and Sweden as being monarchies (thus non-democracies), while the Netherlands and Britain are recorded as democracies since their monarchs had few powers[50]. Fascist Italy, Nazi Germany, and countries under its occupation are coded as non-democracies, as is Perón's Argentina[51] and pre-1945 Japan. We also test whether Catholicism made social insurance more politically acceptable, since the Catholic church typically plays a more extensive role in society than do Protestant churches. The 'Catholic' variable is the percentage of the 1996 population recorded as being Catholics in the Catholic Almanac[52]. Therefore we have had to assume that the level of Catholicism in a country has been fairly stable over time.

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[49] US Department of Commerce (1975).
[50] See Flora and Alber (1981) p.71 for divisions of countries into democracies and monarchies prior to 1914.
[51] Although there were elections in many of the states coded as being democracies, some executive such as the German Kaiser and Chancellor was not elected. Mesa-Lago (1978) describes Peron as a military, not a civilian ruler.
[52] The *Catholic Almanac* is a yearly compendium of facts about the Catholic faith.

The 'Ethno-linguistic fractionalization' variable measures the probability in 1960 that two citizens of a country would differ either by ethnic or linguistic group. This variable was created by authors in the former Soviet Union,[53] but Easterly and Levine (1997) defend its quality and show that it correlates strongly with other measures of heterogeneity. The 'Elderly' variable is the proportion of the population aged 65 and above, and comes from country censuses[54]. The per-capita GDP data come from Maddison's historical series for GDP and population, and from the Penn World Tables, both of which express GDP in 1985 US dollars. Here we use some constant-growth imputations of GDP per capita where Maddison's series lack observations.[55] The 'War' variable, which we interpret as reflecting the 'Leviathan' view of government growth, is a dummy variable equal to one if a country was a combatant in a major war during the previous decade. The wars included are the 1870 Franco-Prussian war, the Boer war, the Russo-Japanese war of 1904-5, the Japanese invasion of China (1936), the World Wars, and the Korean and Vietnam wars involving the US.

Two demonstration effects are used as regressors. The first is an indicator variable for a country with the same language having previously adopted the given type of system. Thus in 1900 the US has a demonstration dummy equal to unity in its period 'at risk' of adopting OAI, since New Zealand had already adopted such a scheme, but not in its period 'at risk' of adopting health insurance. In the construction of this variable, the Netherlands, Belgium, Germany, Austria and Switzerland are assumed to have the same Germanic language, and Danish, Swedish and Norwegian are assumed to be the same language. The second demonstration effect is an

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[53] The variable appeared in S. I. Bruk, V.S. Apenchenko, *Atlas Narodov Mira,* Moskow, 1964.
[54] Many of the pre-1950 data are summarized in a United Nations (1956) volume.
[55] Thus for example Maddison has Swiss GDP data in 1890 and 1924; we interpolate assuming a constant growth rate between these dates. We have also extrapolated Maddison's (1989) series for Argentina, Portugal, Spain and

indicator variable for occupation within the previous decade by a country with the given type of system. All of the occupations in our data set are by Germany.[56]

Table 5 shows the correlation of the different independent variables in 1900. Urbanization, industrialization and GDP growth are positively correlated, with the latter two variables particularly strongly related. We examine in our empirical work whether the effect of these different variables can be differentiated. More surprising is that the 'non-democracy' variable is negatively related to these measures of economic advancement. Some of the less-developed countries in our sample (Finland, Japan, Argentina, Spain and Portugal) had not achieved democracy by 1900.

5.   Results: The Creation of Social Insurance

Figures 3 (a) to (e) show univariate plots of the date of introduction of either old-age or health insurance against our explanatory variables measured in 1900. Dates at which health insurance was introduced are distinguished by an 'M' prefixing the relevant country's name. Since the date of introduction increases along the y-axis, if an explanatory variable caused systems to be introduced earlier, this would imply a negatively-sloped regression line. The adoption of health insurance is allowed to occur later than that of OAI by a constant term, thus the parallel regression lines in these figures. These figures show higher rates of industrialization, urbanization and of the proportion elderly are associated with slightly earlier

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New Zealand back from 1900 to 1880.
[56] In 1920 (though not before) France is recorded as recently having been occupied by Germany, due to its recovery

introduction, and higher ethno-linguistic heterogeneity and per-capita GDP are associated with later introduction.

Table 6 shows hazard-model estimates for the introduction of an OAI or NHI system. We report the coefficients in the form e^β; thus, a value above one implies that the variable causes the adoption probability to rise, or adoption to occur earlier. We refer to this as a 'positive' effect. The last column in Table 6 gives a sense of the magnitude of the coefficients. Given that the average year of adoption of OAI systems in our sample is 1923, this column reports the change in the date of adoption, in years, implied by a one-standard-deviation increase in the regressor. Where the regressor is a dummy variable, this column reports the effect of its value being one rather than zero. Though only an approximate method of finding the implications of the coefficients for adoption dates, this permits a more intuitive quantification of our variables' effects.[57]

The columns of Table 6 report regressions for each class of theories. The most important variables (besides the demonstration effects) are ethnic fragmentation, income, and non-democracy. The more ethnically-fragmented countries adopted insurance systems later. As figure 3(c) suggests, low measured heterogeneity in Germany and high measured heterogeneity in Switzerland are important to this result. The last column shows that a one-standard-deviation increase in the ethnic fragmentation index implies each social insurance system is adopted 19

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of Alsace and Lorraine in 1919, held by Germany from 1871-1919.

[57] The hazard rate $\lambda_1 = \lambda_0.[\exp\beta_1\exp X_1+...+\exp\beta_k\exp X_k]$, if constant over time, would imply an expected time until adoption of $1/\lambda_1$. Assuming (counterfactually) that λ_1 is constant over time, an increase in X_1 by σ_1 would multiply λ_1 by $\exp(\beta_1\sigma_1)$ and the expected adoption time by $\exp(-\beta_1\sigma_1)$. Since the average time from 1880 until adoption is 42.25 years, this procedure produces the change in date of adoption shown in the last column of Table 6.

years later. Thus this coefficient is large in magnitude, if imprecisely estimated. GDP per capita has a substantially negative effect on adoption probabilities, contrary to the Wagner's Law theory. A one-standard-deviation increase in log GDP per capita in 1900 (roughly how much richer Britain was than Germany at this point) implies OAI adoption 12 years later in the richer country. Non-democracy has a positive effect on system adoption, as the 'political legitimacy' theory predicted. Countries that were always democracies are predicted to adopt insurance systems 16 years later than those that never had democracy. The coefficient on the demonstration effect from linguistically similar countries is surprising, but reflects the differences in policy between, for example, Germany and the Netherlands, and Britain and the US. The effect of German invasions appears as expected in the coefficient on the second demonstration effect.

Table 7 includes the different variables in the regression together. Again we observe a positive effect of for non-democracy and a negative effect of per-capita GDP and ethnic heterogeneity, but none of our coefficients are significant. The level of industrialization enters positively in these regressions. Columns 2 and 3 show that the opposite signs of industrialization and GDP are not merely a result of the considerable positive correlation between these two variables; the signs of the variables are similar when the other is excluded. Our other variables are measured as having very little effect. Table 7 shows that colinearity between our regressors makes their effects hard to distinguish. For example, some of the earlier countries to adopt insurance systems, such as Germany, Austria and Japan, were poor and non-democratic in the relevant period, and are also ethnically homogenous.

The role of some factors may be obscured in Table 7 by pooling all social-insurance

systems together. As our earlier discussion suggested, insurance and minimum systems may

respond to very different factors. To test this, Table 8 reports hazard models for the two systems

separately. The first two columns of Table 8 show hazard models for means-tested and

insurance systems, with a country censored in one estimate when it has adopted the other. In

these two columns the coefficients on 'Catholic' and 'Ethnic' were estimated as exploding

towards positive infinity or zero, so we report which of these occurred rather than the actual

coefficient. The coefficient on the 'ethnic' variable is unstable in the regressions in this table,

due to the small number of observations and the fixity of the 'ethnic' variable over time.[58] The

third column shows the hazard for any Old-Age Insurance system, and the fourth the hazard for a

National Health Insurance system. The last column shows the likelihood ratio test for whether

each variable has the same effect on means-tested as on insurance systems.[59] Three results stand

out from this table: richer countries were more likely to adopt means-tested systems, and

Catholic and non-democratic countries were more likely to adopt insurance systems. With

twenty observations, however, the power of the tests of the restrictions that the variables have the

same effect on the adoption of both types of system is likely to be low.

Defining which type of OAI system a country introduced first is not always simple. The

US, for example, introduced means-tested Old Age Assistance as part of the 1935 Social

Security Act. We code the US as having introduced an 'insurance' system first, as earnings-

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[58] In univariate regressions, the effect of ethnic heterogeneity on each of the three hazards is negative, as is found in Tables 6 and 7. In the multivariate regressions in Table 8, the 'ethnic' coefficient is typically strongly positive, a seemingly spurious result. The coefficients from univariate regressions of 'Means-tested' and 'Insurance' hazards on ethnic heterogeneity are 0.796 and 0.635 respectively, suggesting no differential effect.
[59] If L_U is the unconstrained likelihood, and L_C the likelihood with J constraints, the statistic $-2(\ln(L_C)-\ln(L_U))$ is distributed as $\chi^2_{(J)}$ under the null that the constraints are true.

related OASDI was eventually the more significant of the systems introduced in 1935. The reverse is true of Sweden; although an insurance system was introduced in 1913, means-tested benefits soon became more widely claimed. The implication of different coding choices, and our main results from Table 8, are illustrated in figures 4 (a) to (c).

First, figure 4 (a) shows the dates of OAI system adoption and the type of system adopted, by countries' level of per-capita GDP in 1900. The hazard coefficients depend both on how rich the adopters were and how quickly they adopted each type of system. Hence in the hazard for adoption of means-tested systems, Australia adds to the coefficient on GDP because it is both to the bottom and to the right of the scatter. Figure 4 (a) shows that the relatively early adoption of means-tested systems by the British Commonwealth countries and by Denmark, and the adoption of insurance systems by Spain, Italy and Germany, which were poorer in 1900, drive the difference between the GDP coefficients in the first two columns of Table 8. A change in the coding of the type of system initially adopted by either Sweden or the US only increases the differential in the coefficients on per capita GDP. Since this model treats the hazards of adopting each type of system as being independent, using the method outlined above, our coefficients imply that a country one standard deviation richer than the mean in 1900 would adopt a means-tested system twenty-two years earlier but an insurance system twenty-four years later than a country with mean GDP per capita.

Second, figure 4 (b) shows the type and date of OAI systems first introduced in each country by the level of professed Catholic belief in 1996. Here we can see why the coefficients on Catholicism in columns 1 and 2 of Table 8 tended to zero and infinity: all the most heavily

Catholic countries introduced insurance systems, whilst many of the countries with the least Catholics introduced means-tested systems. Again coding the Swedish and American systems differently changes the results little. The difference between the effects of Catholic belief on the hazard of adopting each type of system is reflected in the significant likelihood ratio statistic in column 5.

Third, our results show support for the political legitimacy theory. As Tables 6 and 7 show, non-democracies are more likely to adopt social insurance programs than are democracies, and they are more likely to adopt insurance relative to means-tested systems, as the instability theory predicted. The coefficients in Table 8 imply that a consistently non-democratic country would be seventeen years later to adopt a means-tested system but twelve years earlier to adopt an insurance system than a democracy. As figure 4 (c) shows, the differential effect of democracy is largely driven by the adoption of means-tested systems in New Zealand, Australia and the UK.

Finally, Table 8 helps explain the puzzling negative effect of per-capita GDP in Table 6. High income countries are less likely to adopt social insurance systems - contrary to Wagner's Law - but when they do adopt systems they are more redistributive than insurance. This is consistent with the luxury-good theory of social insurance.

6.   Conclusions

Our overall results on the adoption of social insurance programs are mixed. In univariate regressions, we find that richer countries adopt insurance systems later, as do more ethnically- or linguistically-heterogenous countries. However, these results are much weaker in models with multiple regressors, because of correlation between our regressors and our limited sample size.

Our analysis of the type of system adopted is more consistent with the theories. Higher-income countries are slower to adopt social insurance systems, but when they do adopt them, these systems are more redistributive, consistent with a positive income elasticity for redistribution. Heavily Catholic countries are slower to adopt OAI systems, but when they do so these are more likely to be insurance-style systems. And non-democratic governments are more likely to adopt insurance systems, perhaps as a way of building the legitimacy of the state.

The results thus provide support to several of the theories. But overall, it is difficult to distinguish among the different theories, and our empirical estimates highlight this difficulty. Statistically, the difficulty in teasing apart the different theories is a result of the small sample size and the high correlation of the variables. More fundamentally, it may reflect the fact that different factors are operating in different countries. All of the theories posited find clear evidence in the case history of some countries, necessarily meaning that other theories do not. This diversity of explanations reflects the fundamental importance of these systems in many different ways.

Indeed, what is particularly apparent about social security systems is how durable they are. Systems started for one reason maintain that structure for many decades to come. Since the decisions about social insurance programs made at one time extend so far into the future, making the initial decisions correctly is a particularly important issue.

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Table 1: Characteristics of Social Insurance Systems in Seventeen Developed Countries				
	Mean	Standard Deviation	Minimum	Maximum
Old Age Insurance				
Percent of GDP, 1995	11.1	3.8	5	15.4
Change in Percent of GDP, 1960-95	6.7	3	1.7	11.2
Percent of Government Spending, 1995	21.9	5.1	11.2	29.4
Change in Percent of Government Spending, 1960-1995	6.2	5.8	-7.4	14.9
Insurance Systems				
Percent of GDP, 1995	11.9	3.6	5.4	15.4
Change in Percent of GDP, 1960-95	6.8	2.6	3.1	10.4
Minimum Systems				
Percent of GDP, 1995	8.5	3.6	5	12.5
Change in Percent of GDP, 1960-95	5.1	3.1	1.7	8.5
Systems which Switched, Minimum to Insurance				
Change in Percent of GDP, 1960-95	8.2	3.8	2.6	11.2
Health Insurance				
Percent of GDP, 1995	6.2	1	4.4	8.2
Change in Percent of GDP, 1960-95	3.8	1.3	2.1	5.6
Percent of Government Spending, 1995	12.9	3.3	8.5	19.4
Change in Percent of Government Spending, 1960-1995	3.9	4.3	-4.2	13.6

Note: The sample is the following 17 countries: Australia, Austria, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Netherlands, Norway, Sweden, Switzerland, the UK and the USA.

Government spending is defined as total government outlays, including government consumption, subsidies and transfers, debt interest, capital formation, and asset purchases.

OAI systems which switched from minimum to insurance systems between 1960 and 1995 are included as insurance systems in row 5, which describes levels, but not in row 6, which describes growth.

Sources: Health data from OECD Health Data 2000 CD-Rom, 1960 OAI spending from OECD (1988), 1995 OAI spending from OECD SOCX database. Total outlays of government from OECD *Historical Statistics*, 1997 Edition, Table 6.5.

Table 2: The Introduction of Old-Age Insurance

Time Line			Cause of Introduction	Type of System	Later Changes
	1889	Germany	Monarchic state tries to Reduce support for socialists.	Earnings-related contributions and benefits. Originally restricted to and Compulsory for blue-collar workers below an income threshold.	Scheme for white-collar workers below a higher income threshold added in 1911. Expansion to rest of workforce in 1957, 1972.
	1891	Denmark (inc. Iceland)	Relieves rural poverty.	Universal coverage since all could apply for means-tested benefits.	Benefits originally paid at age 60; pension age raised to 67 in 1956.
	1898	New Zealand	Response to recession of 1880 -1895 in arguably world's Richest country per capita.	Means-tested system with Universal coverage.	Eligibility age reduced from 65 to 60 in reform of 1938.
	1908	Britain (inc. Ireland), And	Rich, highly-industrialized country	Universal means-tested System	Means-testing abandoned in 1948. Voluntary earnings-related system from 1978.
		Australia	Recession of 1890s	Universal means-tested system.	Addition of universal flat-rate benefit in 1973
	1913	Sweden	German demonstration effect, but farmers delay system, in Largely agricultural country	Universal contributory scheme, recedes as means-tested benefits are introduced	Means-tested benefits in 1921, flat rate benefits 1948, new earnings-related system in 1959
	1919	Italy, and	Recession, social unrest follow First World War	Bismarckian, covers all employees	Extended to self-employed, farmers 1957-61
		Spain	Social unrest follows First World War, Though Spain a non-combatant	Covers all private-sector employees with Earnings below an income threshold	System reorganized in 1963, income threshold abolished. Rapid spending growth after Democratisation in late 1970s.
	1924	Belgium	Industrialization prompts but Church-Socialist competition Delays introduction	Compulsory scheme for workers below Income limit. Separate, larger scheme for White-collars in 1925.	Basic structure retained in post-liberation reorganization of 1944.
	1927	Canada	Ethnic heterogeneity, federal Constitution delay introduction	Universal means-tested System	Flat-rate benefits from 1951, new earnings-related system in 1965
	1928	Austria	Recession of 1920s. Limited system for white-collar workers since 1906.*	Covers workers; insurance benefits Suspended, pays assistance benefits	German occupiers impose their insurance system in 1938

(Time Line markings: 1890, 1900, 1910, 1920)

* By 1926 only 7 percent of the labour force were covered under this earlier scheme; by 1931 43 percent were covered.

Table 2: (continued) The Introduction of Old-Age Insurance

Time Line			Cause of Introduction	Type of System	Later Changes
1930	1930	France	German demonstration effect, after return of Alsace-Lorraine in 1919	Originally covers blue-collars only, Subject to an upper income limit	System is extended in 1946 to cover farmers, white-collars, but redistribution is minimal
	1935	Portugal	Introduced by new dictator Salazar	Earnings-related system for wage-earners in industry and services	Extended to rural workers 1962-9, minimum benefit in 1974
	1936	Norway	Introduction delayed by arguments over degree of redistribution	Universal means-tested System	Means-testing abandoned in 1957. Earnings-related system added in 1967.
	1937	Finland	Introduction delayed by lack of sovereignty and democracy until end of First World War.	Means-tested system with additional small earnings-related component.	Means-testing abandoned in 1957. Earnings-related system added in 1960.
	1937	USA	Severe Recession	Means-tested OAA benefits are surpassed in size by earnings-related OASI benefuts around 1950	Substantial increase in benefits and coverage 1950-60. Means-tested SSI from 1971.
1940	1942	Japan	Tax increase to prevent wartime Inflation	Covers employees and their families Benefits related in part to earnings, partly only to months of contribution	No benefits paid until 1965. Flatter system for self-employed in 1961.
	1944	Argentina	Military ruler Peron pacifies unions	Previous system covering specific groups extended to urban workers	Extended to rural, self-employed professional workers in 1954
	1947	Netherlands	Wartime recession, postwar universalism	Near-universal system with income-tested Pensions	Universal flat-rate system from 1957, generous disability insurance from 1967
	1948	Switzerland	Delayed by opposition of well-developed private funds	Universal earnings-related system	

Table 3: The Introduction of Health Insurance

Time Line			Cause of Introduction	Type of System	Later Changes
1880					
	1883	Germany	Monarchy	In-kind and cash benefits for low-income workers	1911: income ceiling raised, Extended to servants and Agricultural workers
1890	1889	Austria	Monarchy, follows Germany closely	Benefits for low-income blue-collars	Extended to family members After Anschluss in 1938
	1909	Norway	Follows Germany closely	Benefits for low-income blue-collars	
1910					
	1911	Britain	Response to union militancy, Poor health of conscripts	Benefits for low-income blue-collars	National Health Service in 1948
	1927	Japan	Military government, concerns over Physical quality of conscripts, labour force	Benefits for low-income blue-collars	Extended 1938-9, during WWII New universal system in 1961
	1930	France	Again competition with Germany over Alsace-Lorraine	Benefits for low-income blue-collars	Extended in 1945
1930	1933	Denmark	Response to Depression	Becomes compulsory to insure privately	State Health Insurance in 1973
	1935	Portugal	Introduced by new dictator Salazar	Limited measures attached to OAI Act	National Health Service in 1979
	1938	New Zealand	Response to Depression.	Universal; free in-patient services Means-tested sickness payments	
1940	1941	Netherlands	German Occupiers Impose Scheme	Covers low-income workers	Acute care extended from 1967
	1942	Spain	Fascist	Covers all salaried employees	National Health Service in 1986
	1943	Italy	Fascist	Covers all salaried employees	National Health Service
	1944	Belgium	Considered vital for postwar reconstruction.	Covers all salaried employees	
	1947	Sweden	Pre-exisiting system of free, tax-financed Hospitals	Universal system; cash and in-kind benefits.	
1950					
	1962	Finland	History of resistance by large rural sector Anxious not to fund urban benefits	Universal system of cash benefits	
1960	1964	Argentina	Extension of sectoral systems to all urban Workers	Cash Sickness benefits for employees	Extended to rural workers in 1971
	1965	USA	Long resistance from doctors	Universal Hospital Insurance for elderly	
1970	1966	Canada	Compulsory hospital insurance in 1947	Universal Insurance Scheme	
	1975	Australia	History of subsidized voluntary Insurance	Universal Insurance Scheme	Option to opt for private Insurance in 1976 ends Compulsory nature of scheme
1990	1994	Switzerland	History of subsidised voluntary insurance, Private-sector resistance to compulsion	Compulsory Insurance for in-kind benefits, voluntary insurance for cash payments	

Table 4: Summary Statistics for Independent Variables in 1900			
Variable	Definition	Mean	Standard Deviation
Ravages of Capitalism			
Industry	Percent of labour force employed in industry.	27.2	10.01
Urban	Percent of population living in cities with more than 100,000 occupants.	13.51	9.02
Recession	Number of years of negative GDP growth in the previous ten.	1.9	1.66
Political Legitimacy			
Non-democracy	Dummy equal to one if country has a monarchy or other type of non-elected executive.	0.45	0.51
Catholicism	Proportion of Population Catholic in 1996.	0.43	0.37
Demographic Heterogeneity			
Ethnic	Probability of two citizens being of a different ethnic or linguistic group in 1960.	0.25	0.22
Elderly	Percent of Population over 65.	5.56	1.53
Income Growth/Wagner's Law			
Ln(GDP/Capita)	Log GDP / Capita in 1985 Dollars.	7.67	0.41
Leviathan			
War	Dummy equal to one if a country was a combatant in a major war during the preceding decade.	0.5	0.22
Note: N = 20 for all but recession years, where N=14.			

	Industry	Urban Habitation	Non-Democracy	Catholic Belief	Ethnic Division	Percent Elderly	Log GDP per capita
Urban Habitation	0.32						
Non-Democracy	-0.62	-0.27					
Catholic Belief	-0.05	-0.07	0.03				
Ethnic Division	0.31	0.06	-0.48	0.19			
Percent Elderly	-0.02	-0.29	-0.07	-0.17	-0.35		
Log GDP per capita	0.67	0.57	-0.61	-0.08	0.53	-0.23	
Recent Recession	-0.24	0.2	-0.37	0.08	0.33	-0.52	0.05

Table 5: Correlation Matrix of Variables Measured in 1900

Table 6: Explaining the Birth of Social-Insurance Systems
[Dependent Variable: Year of Adoption of System; Coefficients are Hazard Rates]

	1	2	3	4	5	6	7	Effect of 1 σ Change, Adoption Year
Capitalism								
Industrialization	1.0003							-0.1
	(0.01)							
Urbanization	0.996							2
	(-0.3)							
Recession Years in	1.02							-1
Past Ten	(-0.3)							
Political Legitimacy								
Non-democracy		1.59						-16
		(1.4)						
Catholic		0.57						5
		(-0.7)						
Ethnic Division								
Ethnic-Linguistic			0.19*					19
Heterogeneity			(-2.1)					
Demographics				1.03				-2
Percent Elderly				(0.3)				
Wagner's Law					0.55*			
ln(GDP/capita)					(-2)			12
Leviathan						1.1		
War						(0.3)		-4
Demonstration Effects								
Same-language country has adopted							0.51**	41
							(-2.1)	
Occupier has Adopted							1.95*	-21
							(1.98)	
Summary Statistics								
N	40	40	40	40	40	40	40	
ln(Likelihood)	-108	-107	-106	-108	-106	-108	-106	

Note: T-statistics are in parentheses. A dummy is included where the hazard in question is the adoption of medical insurance. Errors are clustered by country. ** Denotes coefficients significant at the 5% level, * at the 10% level.

Table 7: Explaining the Birth of Social Insurance Systems
[Dependent Variable: Year of Adoption of System]

	1	2	3
Capitalism			
Industrialization	1.05	1.03	---
	(1)	(0.7)	
Urbanization	1.004	0.99	1.003
	(0.2)	(-0.5)	(0.2)
Recent Recession	1.07	1.08	1.01
	(0.7)	(0.8)	(0.9)
Political Legitimacy			
Non-democracy	1.26	1.43	1.13
	(0.6)	(0.97)	(0.4)
Catholicism	0.55	0.72	0.74
	(-1)	(-0.8)	(-0.6)
Ethnic Fragmentation			
Ethnic-Linguistic	0.3	0.13	0.31
Heterogeneity	(-0.8)	(-1.5)	(-0.9)
Demographics			
Percent Elderly	0.99	0.98	1.07
	(-0.1)	(-0.14)	(0.6)
Wagner's Law	0.44	---	0.73
ln(GDP/capita)	(-1.1)		(-0.46)
Leviathan	0.9	0.97	0.95
War	(-0.2)	(-0.1)	(-0.1)
Summary Statistics			
N	40	40	40
ln(Likelihood)	-104	-104.7	-105.2

Note: T-statistics are in parentheses. A dummy is included where the hazard in question is the adoption of medical insurance. Errors are clustered by country.

	Means-Tested	Insurance	Any OAI System	Health Insurance	Likelihood Ratio Stat.
Table 8: Explaining the Birth of Old Age Insurance Systems [Dependent Variable: Year of Adoption of System]					
Capitalism					
Industrialization	0.96	1.06	1.03	1.03	1.57
	(-0.6)	(0.9)	(0.7)	(0.6)	
Urbanization	1.03	1.02	1.03	0.997	
	(0.6)	(0.3)	(0.7)	(-0.01)	
Recent Recession	0.63	0.9	0.8	1.55	
	(-1.6)	(-0.04)	(-1)	(1.7)	
Political Legitimacy					
Monarchy	0.71	1.4	1.34	1.67	0.18
	(-0.3)	(0.3)	(0.4)	(0.6)	
Catholicism	(→0)	(→∞)	0.8	0.12	24.14**
			(-0.2)	(-1.6)	
Ethnic Fragmentation					
Ethnic-Linguistic Heterogeneity	(→∞)	(→∞)	1.38	0.12	0.66
			(0.2)	(-0.97)	
Demographics					
Percent Elderly	1.3	1.04	1.14	1.002	0.01
	(0.8)	(0.1)	(0.5)	(0.01)	
Wagner's Law					
ln(GDP/capita)	6.1	0.33	0.69	0.27	0.88
	(0.99)	(-0.78)	(-0.32)	(-1.22)	
Summary Statistics					
N	20	20	20	20	
ln(Likelihood)	-18.38	-21.14	-41.58	-34.9	

Note: T-statistics are in parentheses. Column 5 lists likelihood ratio statistics for a difference between the coefficients in columns one and two. * Denotes a coefficient significant at the 10% level, ** a coefficient significant at the 5% level.
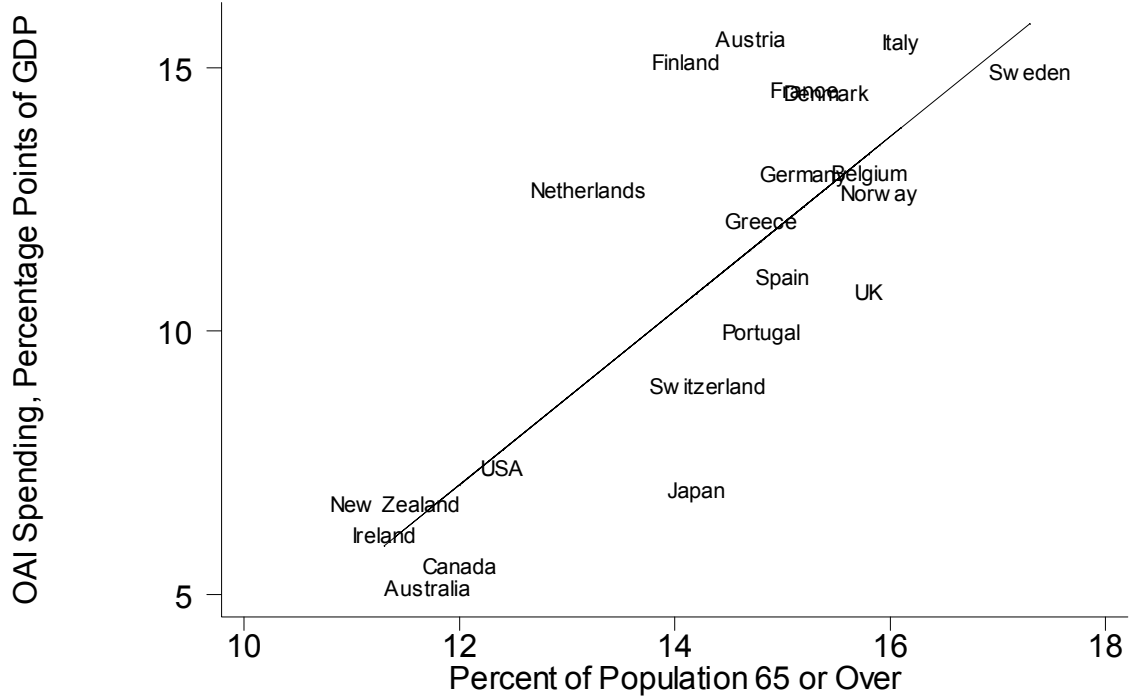
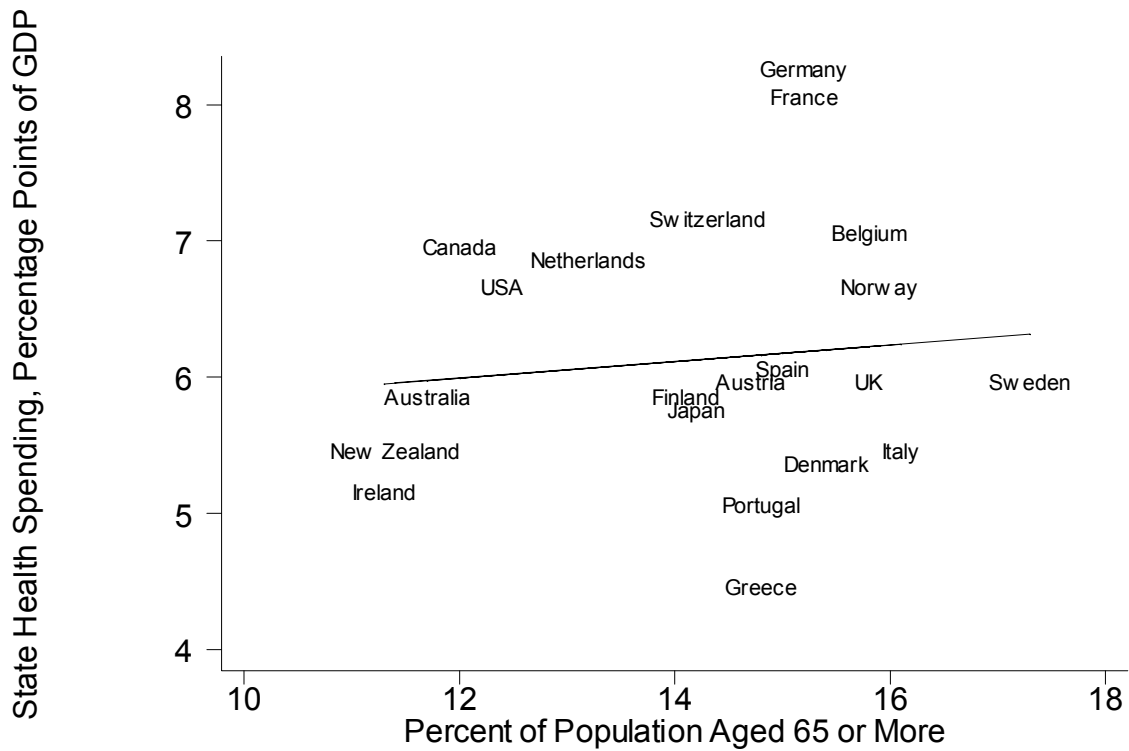Figure 1   <u>State Pension Spending and the Proportion of Populations Aged 65 or More, 1995.</u>

Figure 2   <u>State Health Spending in Percent of GDP and Population Aged 65 or More, 1995.</u>
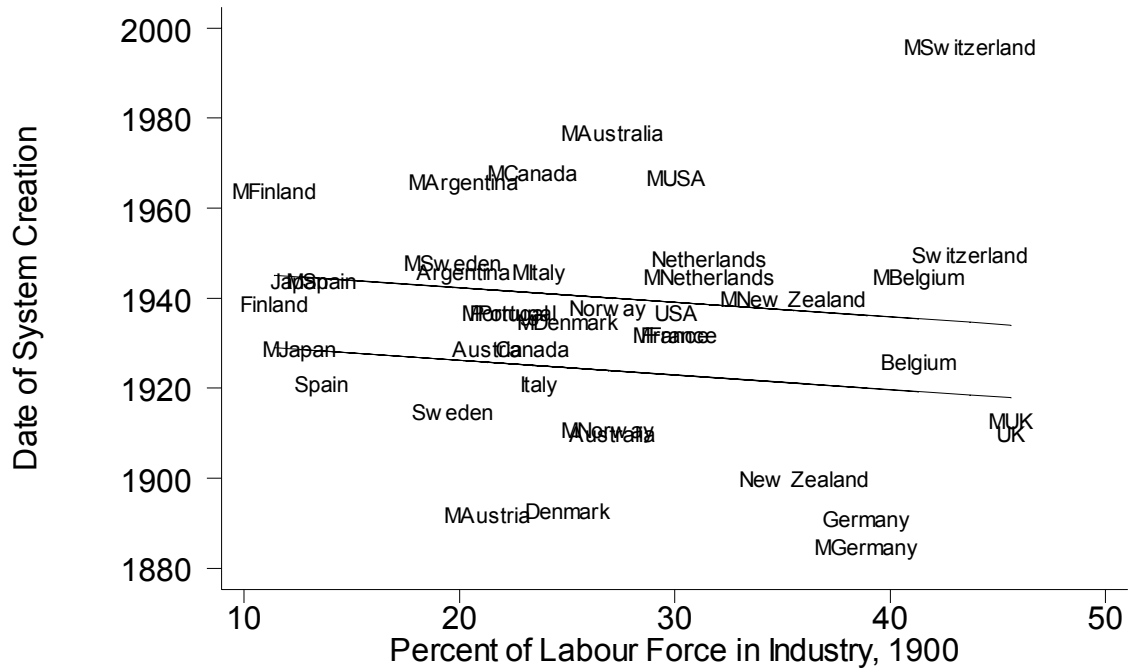
Figure 3 (a): Date of System Creation

(chart axis labels and data points)

2000 — MSwitzerland

1980 — MAustralia

1960 — MFinland, MArgentina, MCanada, MUSA

1940 — MSweden, Argentina, MItaly, Netherlands, MNetherlands, Switzerland, Java/MSpain, Finland, MPortugal, Norway, USA, MNew Zealand, MBelgium

1920 — MJapan, Spain, Austria/Canada, MDenmark, MFrance, Italy, Belgium, Sweden, MNorway, Australia, MUK, UK

1900 — New Zealand

1880 — MAustria, Denmark, Germany, MGermany

Percent of Labour Force in Industry, 1900 (10, 20, 30, 40, 50)

Figure 3 (a): Creation Dates of OAI and NHI Systems, and Industrialization in 1900.
Country names prefixed 'M' show creations of Health Insurance Systems.

Figure 3 (b): Date of System Creation

2000 — MSwitzerland

1980 — MAustralia

1960 — MFinland, MCanada, MUSA, MArgentina

1940 — New Zealand, Finland, Switzerland, MSweden, MBelgium, MSpain, Netherlands, Argentina, MNetherlands, MNorway, MPortugal, MDenmark, USA, MItaly, MFrance, Canada/Australia, Belgium, Spain/Italy, Sweden

1920 — MNorway, Australia, MUK, UK

1900 — New Zealand

1880 — MAustria, Germany, Denmark, MGermany

Percent of Population in Cities of 100,000 or More, 1900 (0, 10, 20, 30, 40)

Figure 3 (b): Creation Dates of OAI and NHI Systems, and Urbanization in 1900.
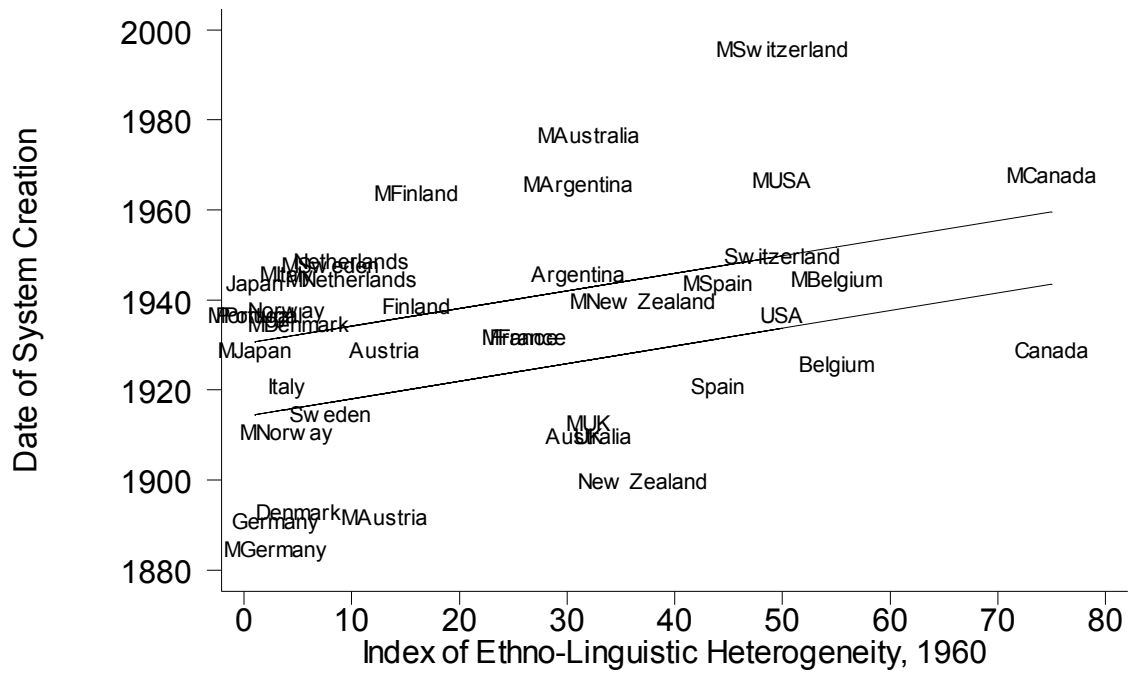Country names prefixed 'M' show creations of Health Insurance Systems.

Figure 3 (c): Creation Dates of OAI and NHI Systems, and Ethno-Linguistic Heterogeneity in 1960. Country names prefixed 'M' denote creations of Health Insurance Systems.
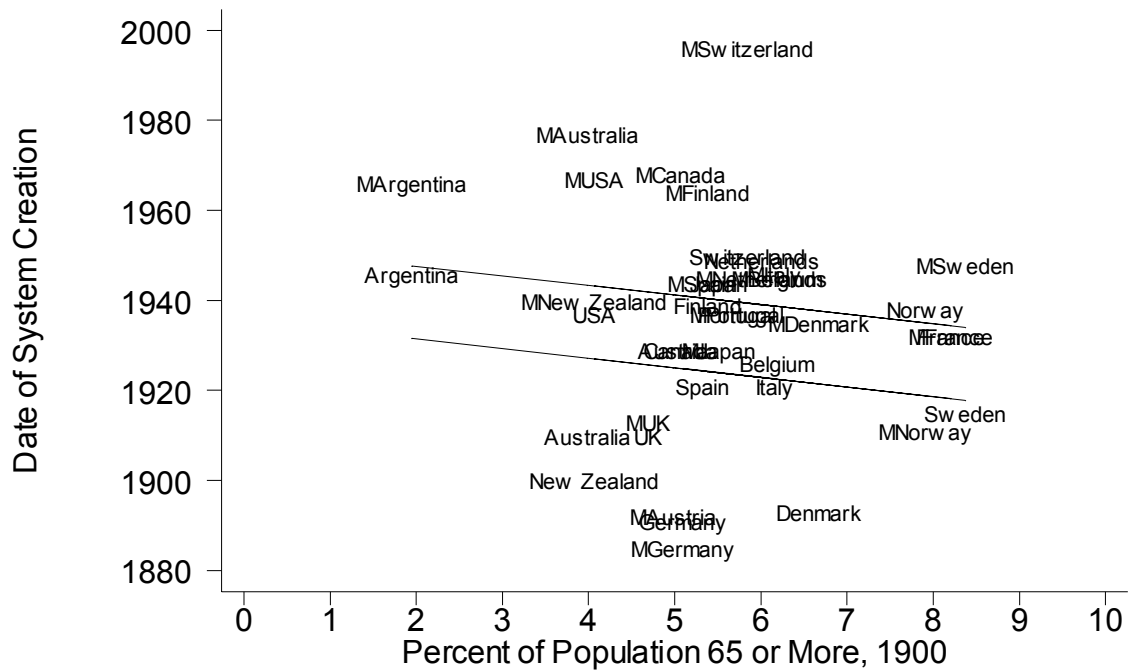

Figure 3 (d): Creation Dates of OAI and NHI Systems, and Aged Population in 1900.
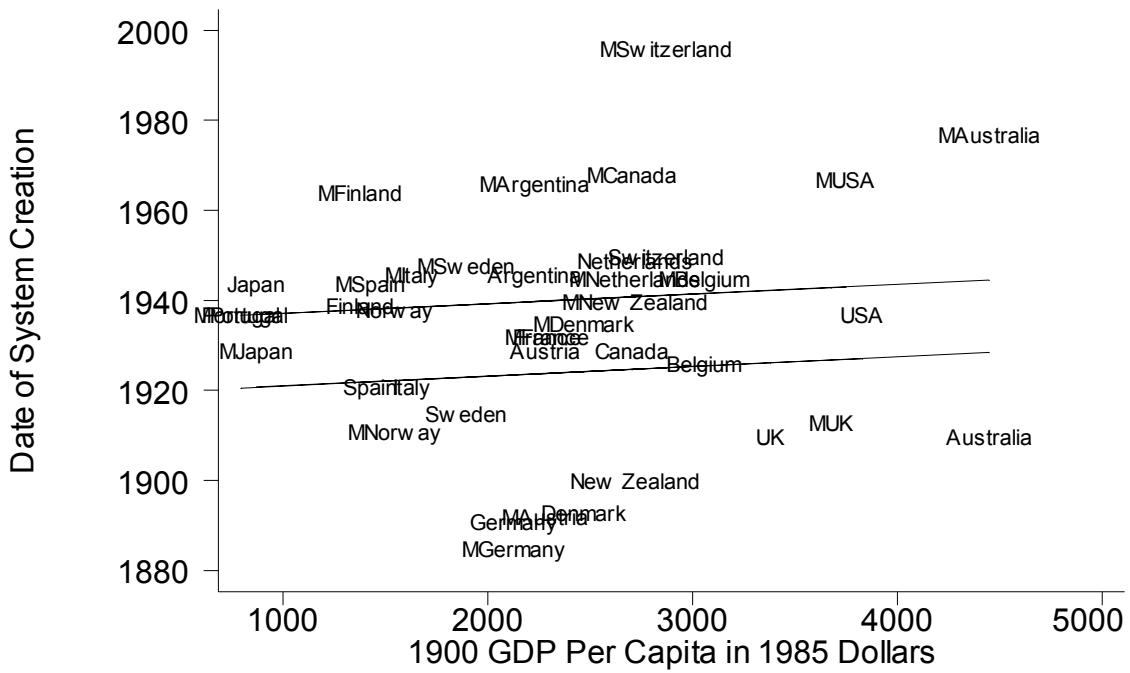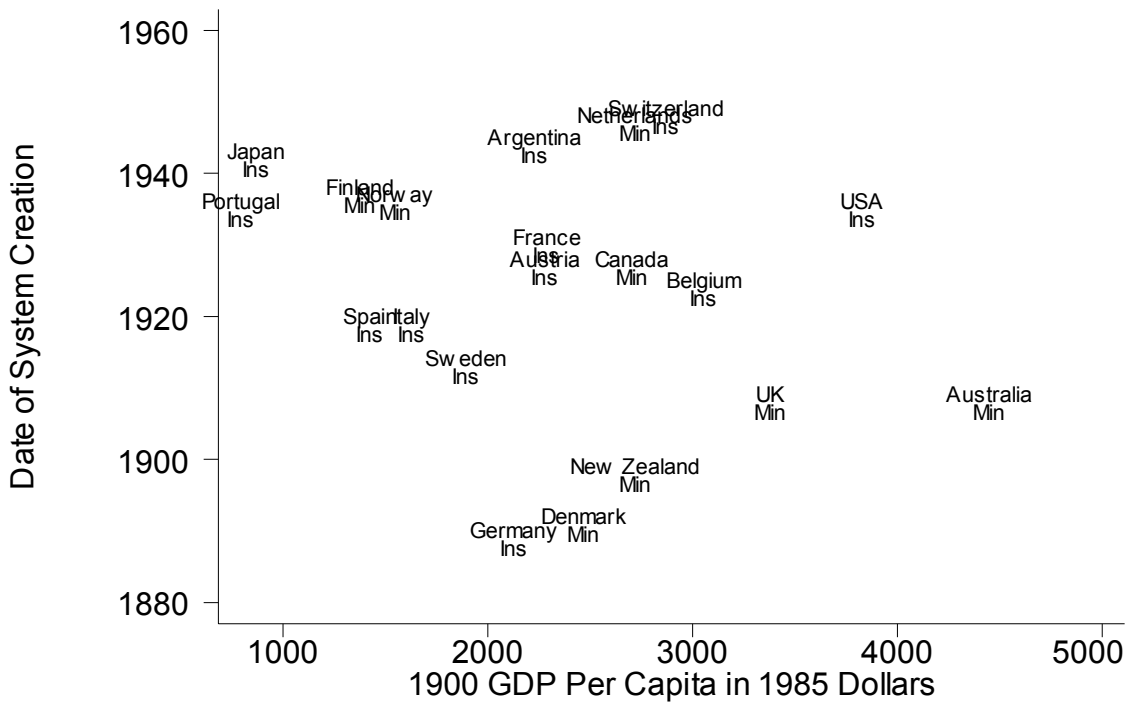Country names prefixed 'M' denote creations of Health Insurance Systems.

Figure 3 (e):   Creation Dates of OAI and NHI Systems, and GDP Per Capita in 1900.
Country names prefixed 'M' denote creations of Health Insurance Systems.

Figure 4 (a):   Date and Type of OAI System Adopted, and GDP Per Capita in 1900
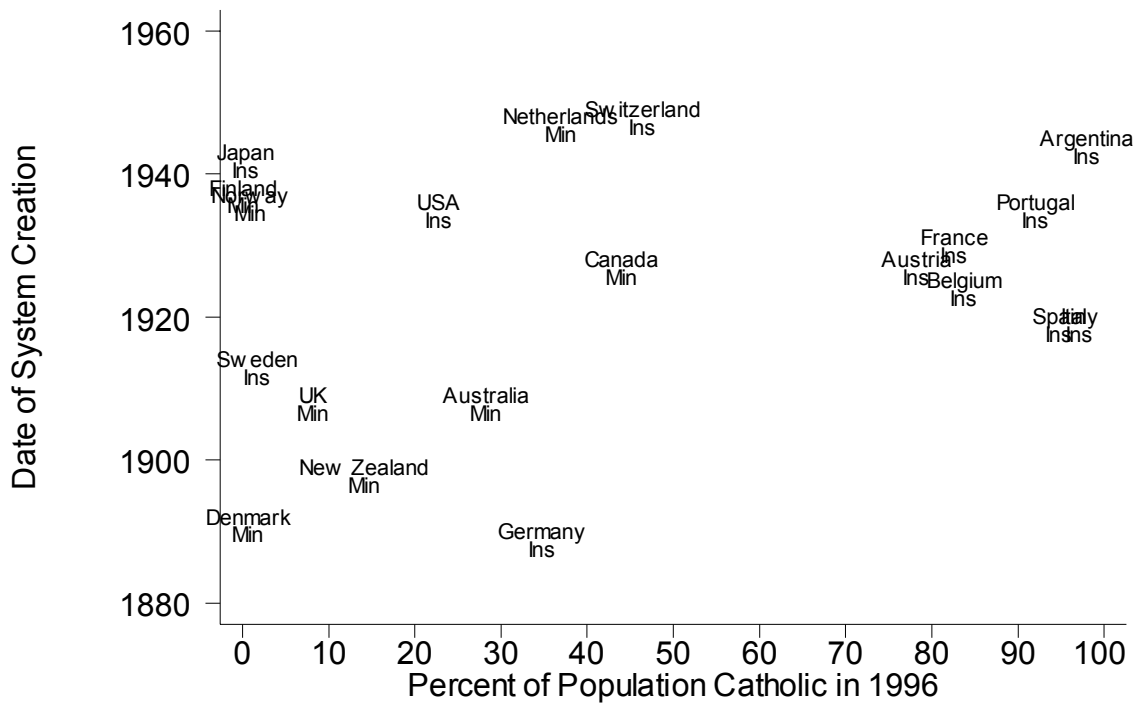'Ins' denotes an Insurance System, 'Min' a Minimum system.

Figure 4 (b):   Date and Type of OAI System Adopted and Catholic Belief in 1996
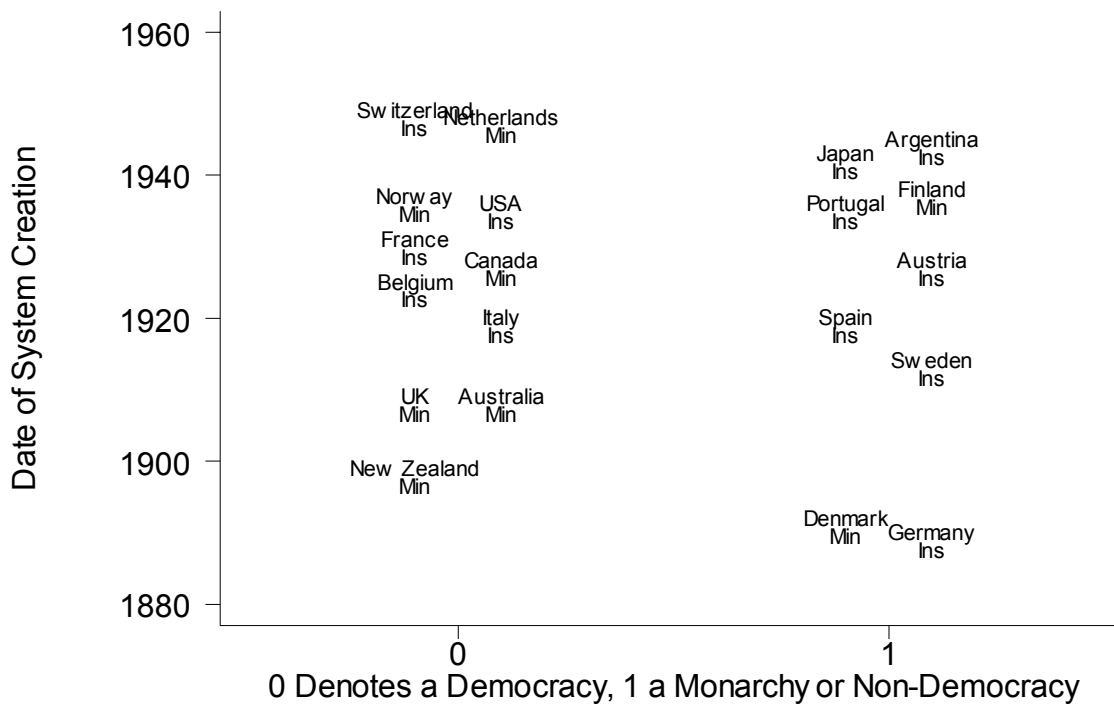'Ins' denotes an Insurance System, 'Min' a Minimum system.

Figure 4(c):   Date and Type of OAI System Adopted by Political Regime in 1900

'Ins' denotes an Insurance System, 'Min' a Minimum system. The country names are offset around 0 and 1 merely to aid visibility.