Does social trust determine the size of the welfare state?
Evidence using historical identification

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Abstract Most modern welfare states offer an extensive array of services and benefits that are wholly or partly financed by tax revenue. One missing link in explaining the long-run sustainability of such comprehensive welfare states could be the already-existing stock of trust. Indeed, our cross-country results suggest that trust determines the size of welfare states as well as three features that are arguably necessary for their preservation: high levels of political confidence, strong legal institutions protecting private property rights, and low levels of bureaucratic corruption.

Keywords Social trust · Welfare state · US immigrants · Historical identification

1 The puzzle of welfare state sustainability

The modern welfare state accords the state a dominant role as the supplier of social services and benefits, which are predominantly financed via an array of taxes. In Scandinavia, the countries with the largest and most redistributive welfare systems in the world, the combined burden of income taxes, VATs, and other taxes are also the highest in the world (Bergh 2009; Sabirianova Peter et al. 2010; Jensen and Svendsen 2011). More than 50 % of national income is collected from taxpayers through direct and indirect taxes and redistributed via the public sector, one in three work directly in the public sector, and more than half of all employed individuals receive the bulk of their income from government organizations or programs (Paldam 2004; OECD 2008).

Thus, almost all large universal welfare states have unusually equal post-tax and post-transfer income distributions, achieved by redistributing a substantial fraction of total income from rich to poor, as well as to very large middle classes. Although on a smaller scale,

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the same is the case for other welfare states, such as Bismarckian, continental, and Asian types (Paldam 2004; Bergh 2004). Nonetheless, the governments presiding over these transfers are regularly endorsed by publics, and most policies are traditionally reached through consensus politics. Our main question in this paper is which factors, despite potentially major challenges and problems, make these welfare states fiscally sustainable in the long run.

Yet welfare states are arguably sensitive to free-rider problems and bureaucratic failures. Without some form of preexisting moral constraint likely provided by social trust, such problems would make it difficult to establish universal welfare states of a certain size. We therefore focus on the role of social trust in enabling large modern welfare states to remain fiscally sustainable. Higher levels of social trust not only reduce the likelihood of free-riding, but also imply that bureaucracies are more effective, ceteris paribus, thereby alleviating part of the fiscal pressure of a large welfare state.

In order to solve the inherent causality problem, we take what is arguably a more direct route than previous studies (Rothstein and Stolle 2003; Rothstein 2003, 2009; Bergh and Bjørnskov 2011). Similar to the approach pioneered by Algan and Cahuc (2010), who use trust levels among American immigrant groups to predict growth in their home countries, we focus on a group of more readily comparable countries. By separating the geographical locations of people and the growth effect of their trust levels, Algan and Cahuc provide a convincing causal link from trust to economic growth. We follow their approach in using the current trust levels of specific third-generation immigrant groups in the United States as predictors of trust in 46 countries around the world from which their grandparents emigrated.

In answering the main question about whether relatively high levels of social trust are a necessary precondition for being able to sustain a large welfare state—rather than being an effect of the welfare state or a transitory phenomenon—we structure our empirical evidence into two separate parts: one part showing that social trust predates the rise of the welfare state and another documenting that social trust actually facilitates the size of welfare states.

In Sect. 2, we begin by discussing the possible direct and indirect links between trust and the size of the welfare state. Next, we describe the basic data and document that the current trust levels of third-generation immigrants to the United States are strong predictors of cross-country differences in trust. This fact is used to sidestep the causality issue inherent in our main discussion in Sect. 4 of the relation between present trust levels and the size of the welfare state. Our empirical findings suggest that trust is indeed a determinant of how large welfare states are allowed to grow, along with three other features (good legal quality, low corruption levels, and high levels of political trust) that would also be likely to protect welfare states from fiscal sustainability problems. Section 5 concludes the paper.

2 Social trust and the size of the welfare state

2.1 Types of trust

Trust is interesting in relation to the size of the welfare state, as one of the main functions of it is the redistribution of income between large segments of society. This logically implies that a large segment of society implicitly accepts that their taxes are spent on either direct transfers to strangers or on a set of public goods consumed mainly by strangers.

In principle, two types of trust could be important when observing redistribution, yet at the scale of modern welfare states, trust in other people in general—social trust—is the more important. Social trust differs fundamentally from particular trust by being extended to people on whom the trusting part has no direct information other than a shared nationality. In contrast, particular trust is the type of trust formed in repeated transactions or other

situations in which actions and reputations are built on either a history of transactions or other observable and relevant information.

Keeping these types apart is vital, as Naef and Schupp (2009) find that measures of particular trust and social trust are uncorrelated in German data, and Alesina and Guiliano (2011) even demonstrate a strongly negative association between social trust and trust in one's own family and close friends. When reviewing the surveys in the field, Uslaner (2002) concludes that although Putnam (1993) argued that particular trust arising from interactions in voluntary organizations spills over into social trust, a series of studies has demonstrated that this is far from being the case. This is so, because any correlation between social trust and associational activity arises from trusters being more willing to join such organizations (Sønderskov 2011). We thus note that the microfoundations for many explanations resting on extending the rational trust one forms from the observable behavior of public bureaucrats and politicians, for example, receives very mixed support when tested directly.

Similar problems extend to Putnam's alleged association between trust and social norms of public permissiveness (Uslaner 2002; Bjørnskov 2006). In this context, the distinction between trust—what one expects most other people to do—and norms of public permissiveness—the behavior one would ideally want to observe from one's fellow citizens—is conceptually important, as ideal preferences and actual expectations are almost orthogonal (Fischer 2005; Bjørnskov 2006; Freitag and Traunmüller 2008). Norms that preclude cheating on the welfare state are not only relatively similar across Western countries, they may also be entirely without consequence if relatively few citizens believe that other people will abide by them.

As Uslaner (2002) argues, the trust literature is riddled with confusion between different concepts of trust. Guinnane (2005) even argues that trust is "a concept too many." However, Guinnane's thinking is representative of a strand of the literature that relies on the notion that the concept of "reputation" in economics and political science quite adequately covers all relevant aspects of trust. His dismissal can therefore be supported when it comes to types of trust based on direct information about specific agents, which the social capital literature refers to as "thick," "strategic" or "particular" trust. Yet if extending the argument to all types of trust, it must rest on the assumption that different types all tap into a common background concept. This situation is the starting point for many previous studies exploring Putnam's (1993) explicit theoretical argument, which is rejected by a number of subsequent empirical studies (e.g., Knack and Keefer 1997; Uslaner 2002; Naef and Schupp 2009; Alesina and Guiliano 2011).

2.2 How would trust affect welfare state spending and activities?

Previous studies have hinted at several ways that trust could be associated with the size and scope of welfare states. However, most studies have presented these ideas in intuitive and somewhat ad hoc ways. A careful outline of these arguments is therefore presented in the following. We split them into the direct effects of social trust and its indirect effects, in which trust affects the quality of the formal institutions supporting modern welfare states. Throughout, it is important to keep in mind that social trust is likely to affect both welfare spending and the ability of welfare states to raise the revenue needed to finance spending. As our emphasis is on the long-run sustainability of modern welfare states, the focus must at all time be on the net outcome of these two aspects.

2.2.1 Direct effects of trust

In principle, free-rider problems could be endemic when welfare services are provided universally, as most people might have fully rational incentives to seek such services despite not

being objectively qualified for them (Lindbeck 1995; Paldam 2004). For example, a number of transfers depend on whether or not people live together as couples, have income other than unemployment benefits or similar transfers, or suffer from some illness. As civil status, health, and income in the grey/unofficial economy are not easily observable for public bureaucracies, benefit fraud may constitute a genuine problem for modern welfare states. Likewise, generous unemployment benefits and early retirement schemes possibly create incentives for people to exit the job market despite being fit to continue productive employment. Without some form of preexisting moral constraint such as that which social trust likely provides, such problems would therefore render it difficult to establish and sustain universal welfare states of a certain size.

Given that countries experience such problems, welfare expenditures are likely to increase as the general population overuses welfare programs. More low-trust citizens would mean higher costs per universal benefit scheme or public good supply. In principle, a high level of social trust makes individuals more vulnerable to being cheated by low-trust individuals (Butler et al. 2010). At the national level, however, an average level of trust that does not correspond to the average level of trustworthiness is not a sustainable, evolutionary stable equilibrium: with constant disappointment, even initially trusting citizens would need to adjust their trust beliefs downward (cf. Bjørnskov 2007).

In isolation, a situation in which low trust raises the costs of delivering welfare services to those in need would imply that low-trust countries would have higher public spending, yet such a view ignores whether or not the higher level of spending can be financed. In the short to medium run, countries may be tempted to increase spending. In the long run, however, trust also affects the ability of governments to raise revenue. The only medium-run consequence of low trust inflating spending would be a major budget deficit and loss of international creditworthiness.

Low trust possibly affects the revenue side directly via two channels. First, D'Hernoncourt and Méon (2011) suggest that, ceteris paribus, high-trust countries have smaller underground economies. When possible, their results suggest that low-trust citizens are more likely to conceal income and economic activity from the government, thereby undermining the ability to finance a large welfare state.

Second, Nannestad (2008) and Jensen and Svendsen (2011) note that high-trust populations may be more willing to vote for extending welfare spending to more people with less direct monitoring. In politics, the belief that most people can be trusted also means that it is possible to extend benefits to others without risking substantial fraud. Knowing that social trust reduces the risk of potential free riding—either due to an actual effect or that most voters believe so—contributes to explaining why Scandinavians and populations of other high-trust societies may be willing to pay very high taxes to finance a universal welfare state (Nannestad 2008). In addition, the personal costs of voting in favor of such schemes are reduced, making purely expressive voting for welfare programs more likely. In other words, trust increases the willingness to accept one's taxes being spent on nonmonitored transfers and benefits extended to strangers.

2.2.2 Indirect effects of trust

However, most modern countries have extensive (if imperfect) monitoring, registration, and bureaucratic control with both benefit fraud and tax collection. A counterargument may thus be that trust is irrelevant due to the impact of formal institutions and public bureaucracies: if low trust implies a higher probability of cheating, countries merely need to tighten bureaucratic of both (cf. Algan and Cahuc 2009). Nonetheless, a larger welfare state consequently

also implies a substantially larger public bureaucracy that will impose a fiscal burden on the state (Mueller 2003).

An indirect effect of social trust implies that, all other things being equal, such bureaucracies are more effective (Putnam 1993; Knack 2002). The fiscal pressure that a larger bureaucracy, intended, for example, to keep benefit fraud in check, exerts on large welfare states is alleviated by high levels of trust. By the same logic and following Aghion et al. (2010), Bergh and Bjørnskov (2011) also show that trust allows countries to regulate their economies less tightly.

Owing to this effect on bureaucratic quality and capacity, there may be indirect effects of trust from better institutions. As low levels of trust increase the *potential* for fraud and misuse, having to rely on a large bureaucracy substantially increases the fiscal burden of those parts of public bureaucracies that monitor the provision of public goods and benefits. Such monitoring helps prevent free riding but requires the allocation of additional resources and manpower that could be prohibitively expensive (Bjørnskov 2010; Holcombe and Rodet 2012).

Given that social trust fosters substantially more efficient and less corrupt bureaucracies requiring less monitoring, trust also enables larger welfare states by allowing cheaper and more effective monitoring of their extensive activities. The literature therefore seems to suggest that trust contributes to solving the dilemma that the Roman poet Juvenal phrased in his famous question, "*Quis custodiet ipsos Custodes*?" Who will guard the guardians?

2.3 Solving the causality issue

Answering the main question is complicated by the fact that these claims of causality are disputed in the literature. Rothstein (2003, 2009), a prominent exponent of the opposite causal direction, suggests that the institutional quality of the welfare state is the main determinant of the level of social trust in Scandinavian societies. His main conclusion is that the more universal, uncorrupted, and impartial the government institutions responsible for the implementation of laws and policies are, the more trusting will the population become. It makes no sense to trust "most people" if they are "generally known to bribe, threaten, or in other ways corrupt the impartiality of government institutions in order to extract special favors" (Rothstein 2009:69). In other words, Rothstein argues that people generalize from the particularized trust they form when observing the behavior of bureaucrats to their social trust in ordinary fellow citizens. He also claims that extensive public good provision in Scandinavia increases trust by reducing social cleavages. As such, the potential free rider problem, which would be devastating to the system in less trusting countries, does not unravel the Scandinavian welfare systems.

Further along these lines, Rothstein and Stolle (2003) argue that the high level of social trust in the Scandinavian countries can be explained by (a) the high degree of economic equality, (b) the low level of patronage and corruption, and (c) the predominance of universal non-discriminating welfare programs. Yet Bergh and Bjørnskov (2011) argue that causality in general goes the other way, that is, that high levels of trust solve some of the potential free rider problems and alleviate the problem of fiscal sustainability faced by the welfare state.

Their approach is to use historically determined geographical and linguistic characteristics as instruments for current levels of trust as a solution to the causality problem, which Rothstein claims cannot be solved. Overall, Bergh and Bjørnskov point out the potential viability of using historical and geographical factors to sort out the problem of what came first. In the following, we outline a more direct route to estimating the causal effects of potential mechanisms sketched in this section after first defining the main concepts and their measurement.

3 Measuring and assessing social trust

3.1 Measuring social trust and the size of welfare states

In contrast to particular trust, social trust is defined as the expectation that *most* people can be trusted to follow a set of common norms, that is, as trust "being extended to people on whom the trusting part has no direct information" (Bjørnskov 2007:2). In other words, when assessing whether, and to which extent, "most people" are to be trusted; agents have access to a severely limited information set consisting of their own beliefs about how strangers may act in an unknown number of unknown contexts. As such, this type of trust captures people's expectations that their fellow citizens will act in a decent and honest manner, not taking advantage of other people when a situation otherwise allows doing so. This conceptualization of social trust is thus more or less independent of context, as such situations can arise in all countries and under most conditions.

The concept of social trust is operationalized as the percentage of a population answering in the affirmative to the question "In general, do you think most people can be trusted?" This question has proven to be a dependable and valid indicator in numerous surveys since being introduced by Rosenberg (1956) and added to the US General Social Survey. While Nannestad (2008) notes that this question may seem ambiguous, he and a long list of studies find clear evidence of its validity as a measure of the specific concept of social trust and not other types of trust (e.g., Knack 2001; Uslaner 2002; Bjørnskov and Svendsen 2007; Bjørnskov 2007, 2008; Ostrom and Ahn 2009; Sapienza et al. 2010).

Using this indicator, the three Scandinavian countries clearly stand out from the rest of the world by covering the first three places on the trust measure with scores around 65 %– 70 %, followed, at some distance, by a fourth Nordic country, Finland, the Netherlands (both 59 %), and the English-speaking parts of Canada (54 %). The average of the approximately 110 countries in which credible surveys have been undertaken is slightly below 30 %, while a number of countries exhibit very low levels of social trust (Brazil 3 %, Trinidad and Tobago 4 %, the Philippines 8 %, and Portugal 10 %).

Measuring the size of the welfare state is more difficult. While the theoretical arguments point toward a relationship between social trust and the redistributive part of government activities, quantifying these activities in ways comparable across societies represents a substantial challenge (Bergh 2004). A main problem is that in order to provide citizens, in particularly the relatively poor ones, with access to specific social services some welfare states subsidize access to services produced by the private sector, while other welfare states supply these services directly through public agencies. Bergh and Bjørnskov (2011), for example, note that some welfare states provide direct child grants while others achieve the same goal by allowing tax credits or deductions. Either way, extensive child support becomes a fiscal burden on the welfare state that in the long run requires financing. At the individual level, direct subsidies therefore have the same impact as tax deductions for health care or other welfare services. Moreover, some welfare states produce services and benefits directly, whereas others rely partially on the private market to produce them and then fund these activities in whole or in part. As long as the costs of services are borne by the welfare state and funded through the general budget, the basic effect is in principle the same, although not necessarily placed in the same budget category.

We therefore prefer to measure the size and extent of the welfare states as full government expenditures, that is, the total government outlays for producing social services plus transfers and subsidies. This measure captures all activities, regardless of their mode of delivery. In order to ensure that we are capturing the impact of social trust on the redistributive

part of government, we rerun the analysis with three alternative measures. First, we add government consumption as a share of total consumption. This ensures that the association between trust and government size is not due to the effects of government expenditures on infrastructure or the military, or that a clear trust estimate cannot be obtained if trust also affects investments and thus the denominator of the government size measure (GDP; cf. Dearmon and Grier 2009). As such, we are measuring the effect of trust on the residual part, which logically is the directly redistributive part. Second, we replace full government expenditures with a measure of subsidies and transfers as a percentage of GDP to capture the directly intended redistributive part of government spending. Third, we repeat our analysis, but focus on external assessments of the sustainability of fiscal policy in order to capture potential medium-run problems. To do so, we quantify the December 2011 Standard and Poor's credit ratings in an additive index, such that a perfect AAA rating is equivalent to "1." As such, we estimate the degree to which the main financial market actors implicitly assess the importance of trust for the long-run sustainability of welfare states.

3.2 How stable is social trust over time?

In order to assess the validity of our claim that social trust is a cornerstone of the modern welfare state, it is necessary first to demonstrate that modern trust differences in trust are unlikely the results of the welfare state. We do so in two ways: (1) by reviewing the recent literature on the determinants of social trust; and (2) by arguing that social trust predates the modern welfare state based on an analysis of trust levels among immigrants to the United States. We also provide some fairly straightforward empirical indications to support this claim.

First of all, a number of studies have explored the determinants of social trust, revealing a consistent pattern across the countries covered by the World Values Survey and various similar opinion polls. The relatively few robust determinants all share the characteristic that they are relatively stable over time, indicating that trust is also likely to be stable (Bjørnskov 2007; Nannestad 2008). Yet since the first study to include European welfare states and most of the rest of the world was the initial wave of the World Values Survey in the early 1980s, basing estimates on available cross-country trust scores, we have no way of assess directly the level of social trust in high expenditure welfare societies before the advent of the modern welfare state in the 1960s.

However, the emigration from Europe to America and other more remote parts of the world can be treated as a relevant experiment. A series of studies explores the post-1972 evidence of the US General Social Survey (GSS), which contains information on the family origins of 2nd and 3rd generation immigrants (e.g., Rice and Sumberg 1997; Tabellini 2008; Uslaner 2008; Algan and Cahuc 2009). The basis of these studies is that if social trust has historical roots dating back to before the emergence of the universal welfare state and is therefore fairly stable over time, there ought to be a clear correlation between the trust levels of Americans with ancestors in specific countries and the trust levels in those countries today. This trust would predate the universal welfare state if this is the case, as the ancestors of Americans surveyed in this specific part of the GSS on average arrived to the United States in the 1930s and during or immediately after World War II. In other words, if one can show a clear association between current levels of trust in Europe and the trust of immigrants to the United States with ancestors in these countries, it is improbable that the welfare state
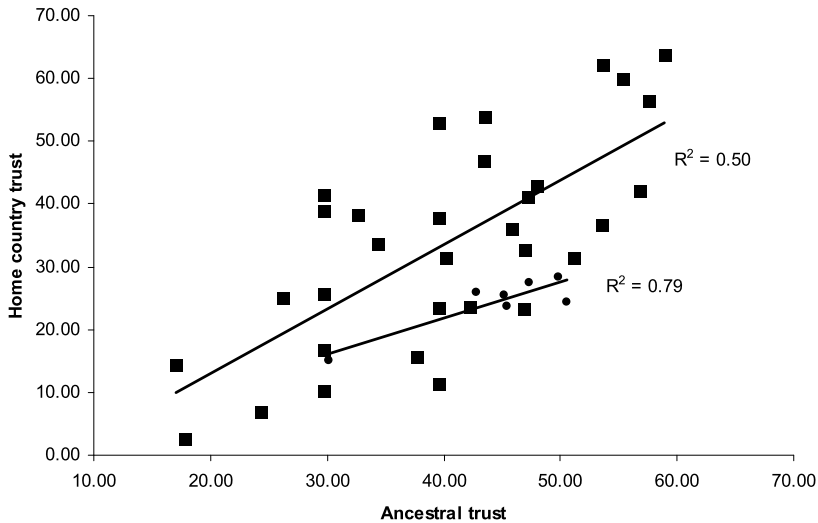
Fig. 1 Trust in the US and the rest of the World, same groups. Note: the *lower* regression *line* refers to post-communist countries, while the *upper line* refers to all other countries. The *lower line* is shifted approximately 13 percentage points down while its slope is not significantly different

has *created* whatever trust differences one can observe between welfare states and other comparable societies.[1]

A clear association between trust in Europe and among US immigrants is precisely what Uslaner (2008) documents, as contemporary American trust levels can explain a very significant part of the present-day variation across their countries of ancestral origin. We replicate these simple empirical indicators in Fig. 1, in which we plot the relationship between the trust of Americans whose grandparents and great grandparents came from specific countries (ancestral trust) and the trust levels in those countries today (home country trust). We employ the two standard sources for these numbers, the GSS (2010) and the World Values Survey (2010), and we supplement the latter with data from the AfroBarometer, LatinoBarometro, and Danish Social Capital Project available in Bjørnskov (2008). When using the GSS, we calculate the average trust scores for each of the "country of family origin" categories for which we also have country data. For the African countries, which the GSS pools together as one for obvious reasons, we calculate a weighted average score with our best guess on the origins of Black Americans. This information comes from Nunn (2008), who uses trade documents to obtain estimates of how many slaves were traded across the Atlantic from each of the present-day African states. Based on the assumption that most of these slaves

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[1]In relation to the particularly high trust levels of Scandinavian welfare states, it necessarily deserves mention that trust levels in Sweden and Denmark have increased since the early 1980s, just as trust levels on average fell in the United States from the late 1960s to the early 1990s. Yet, the particular levels of trust in Scandinavia cannot be attributed to the welfare state. In one of the first individual-level panel studies of trust, Dinesen and Sønderskov (2012) find that the trust increase for Denmark mainly is the result of a less trusting generation growing up around World War II that is now dying and being replaced by their more trusting children. Furthermore, the observed trust increase has occurred in a period in which both Denmark and Sweden rolled back central elements of the social democratic welfare state, which would, following Rothstein's arguments, have led to a trust decline. Since we note the opposite, we suggest that the evidence is inconsistent with the welfare state causing the trust increase.

came to the United States and that the populations have had roughly the same fertility rates since then, we use Nunn's numbers as weights to obtain our average trust score for "African" home country trust.

The figure not only shows the clear association between the two series, it also depicts two separate regression lines through "normal" countries and countries in Central and Eastern Europe with communist pasts; the three Scandinavian countries and Finland are clearly visible as the four dots in the far upper right-hand corner. A simple bivariate regression explains 36 % of the variation, while the figure also suggests the well-documented negative effects of communism (Bjørnskov 2007). In this way, the simple plot presented here suggests the influence of rather deep historical roots, as the majority of the ancestors of current 2nd and 3rd generation Americans arrived before World War II. It is thus consistent with similar exercises in Algan and Cahuc (2009) and Tabellini (2008), and the more sophisticated estimates in Uslaner (2008). The documented level of stability is also consistent with the intracountry differences found in countries such as Italy, Belgium, and Germany. Yet these roots should also be considered in comparison to the major political upheavals of the twentieth century. First, the advent of communist dictatorships in Central and Eastern Europe led to policies directly designed to undermine interpersonal trust and make citizens more directly dependent on the state (Paldam and Svendsen 2001; Bjørnskov and Svendsen 2007). Second, the fall of monarchical institutions in some countries also proved so momentous that trust levels suffered (Bjørnskov 2007, 2008; Robbins 2012).

Table 1 provides more solid indications of the stability of social trust, including the current levels of trust among identifiable ancestral groups in the United States. All data and sources are described in the Appendix, which also outlines the countries for which we have data. While the sample covers only 45 countries with full available data, we note that this size is comparable to most prior studies in the trust literature. Furthermore, our country sample is more homogeneous in terms of average income, political traditions, and culture than most studies. This implies that we can be relatively more certain that the identified associations are actually the effects of inherited trust instead of other unobserved cultural or political differences correlated with current trust differences in the United States.

We start with a parsimonious specification including only the most robust determinants of trust, as outlined in Bjørnskov (2007) and Nannestad (2008)—postcommunist status, monarchy, and income inequality—and supplement this with ancestral trust levels in column 1. In column 2, we add regional controls for Asia, Latin America, and the Caribbean, North Africa and the Middle East, and Sub-Saharan Africa. In both cases, ancestral trust is strongly significant. In subsequent columns, we add three variables suggested by other studies: the share of Protestants in the population (with and without regional controls), full government expenditures to account for effects of welfare states, and political confidence. The last factor effectively controls for Rothstein's (2003, 2009) main hypothesis that social trust is affected by how individuals assess the honesty of civil servants. The Protestant share is significant in columns 3–5, but fails significance in column 6, while neither government expenditures nor political confidence are significant. We have also experimented with estimating effects with a robust regression estimator and adding or excluding variables and regional controls. In most cases, Protestants remain significant, while neither government expenditures nor political confidence is close to significance.

Our main point is that ancestral trust remains significant and quantitatively important throughout the table. Illustrating the average effect of ancestral trust, we find that a one standard deviation change to ancestral trust (13 percentage points)—as measured by current trust among American third-generation immigrant groups—is associated with a change in current social trust of approximately half a standard deviation (eight percentage points).

Table 1 Determinants of social trust

	1	2	3	4	5	6
Postcommunist	−13.070[***]	−12.234[***]	−9.646[***]	−8.819[***]	−9.796[***]	−5.455
	(3.164)	(3.477)	(2.866)	(3.054)	(2.910)	(4.086)
Monarchy	9.663[**]	9.247[**]	6.114	6.254	6.159	7.726[**]
	(4.530)	(4.239)	(3.796)	(3.856)	(3.909)	(3.783)
Income inequality	−0.345	−0.421[*]	−0.403[**]	−0.412[*]	−0.435[*]	−0.399
	(0.226)	(0.236)	(0.189)	(0.212)	(0.222)	(0.282)
US ancestral trust	0.573[***]	0.937[***]	0.353[***]	0.568[**]	0.583[**]	0.697[***]
	(0.165)	(0.242)	(0.131)	(0.212)	(0.219)	(0.204)
Protestant			0.207[***]	0.195[**]	0.200[**]	0.128
			(0.059)	(0.071)	(0.085)	(0.086)
Gov. full expenditures					−0.027	
					(0.156)	
Political confidence						−10.664
						(8.527)
Regional controls	No	Yes	No	Yes	Yes	Yes
Observations	45	45	45	45	44	42
R squared	0.582	0.644	0.668	0.699	0.700	0.743
F statistic	12.22	6.72	18.45	13.43	13.14	15.49
RMSE	10.742	10.444	9.695	9.737	9.989	9.522

Note: [***] ([**]) [[*]] denotes significance at $p < 0.01$ ($p < 0.05$) [$p < 0.10$]; RMSE is root mean squared error. Regional controls are for Asia, Latin America, and the Caribbean, North Africa and the Middle East, and sub-Saharan Africa; the omitted group is therefore the Western World

In other words, the average difference of trust between, for example, Americans of Italian and Swiss origins, is likely, ceteris paribus, to be approximately 60 % of the current trust difference between Italy and Switzerland.

As a final potential drawback of this indication, it is entirely possible that a set of underlying informal institutions or beliefs has created or maintained higher levels of social trust levels within welfare states and contributed to creating institutions in US states in which these immigrants predominantly settled, in turn creating high trust levels in those states. While we cannot entirely reject this possibility, however, Uslaner (2008) shows that the association between Americans' trust and the trust in their ancestors' home countries does not depend on where in the United States they settled or live at present. Instead, his empirical findings support the well-known notion from psychology that a fundamental sense of trust in strangers is passed on from parents to children during childhood (cf. Katz and Rotter 1969; Dohmen et al. 2008).

Taking note of this finding means that some mechanism exists that can, in principle and in the absence of sufficiently dramatic incidents during adulthood, perpetuate stable trust levels across long periods of time, and potentially longer periods than the three or four generations documented in existing studies. We thus find that the bulk of the unique levels of social trust in Scandinavia most probably predate the modern welfare state.

Table 2 Governance effects of social trust

	Legal quality		Corruption		Political confidence		Government size	
Log GDP per capita	0.745***	0.906***	0.972***	1.617***	0.143	0.094	3.163	4.979**
	(0.136)	(0.141)	(0.239)	(0.312)	(0.088)	(0.130)	(2.465)	(2.179)
Openness	0.004**	0.003	0.005	0.004	−0.003***	−0.001	−0.064**	−0.052*
	(0.002)	(0.002)	(0.005)	(0.003)	(0.001)	(0.001)	(0.029)	(0.031)
Postcommunist	0.063	−0.033	−0.531	−0.571	0.351*	0.484***	3.654	0.871
	(0.260)	(0.393)	(0.495)	(0.774)	(0.184)	(0.183)	(5.989)	(7.209)
Log population	0.065	0.043	−0.254	−0.191	−0.009	0.067*	−3.631***	−3.586**
	(0.080)	(0.099)	(0.178)	(0.203)	(0.042)	(0.038)	(1.239)	(1.432)
Common law	0.226	0.363	0.062	0.222	−0.050	−0.023	−3.581	−3.455
	(0.276)	(0.238)	(0.499)	(0.264)	(0.126)	(0.109)	(3.400)	(3.361)
Social trust	0.062***	0.048***	0.076***	0.053**	−0.012***	−0.104	0.653***	0.417**
	(0.012)	(0.011)	(0.018)	(0.021)	(0.004)	(0.399)	(0.283)	(0.214)
Income inequality		0.004		−0.012		−0.001		−0.302
		(0.017)		(0.033)		(0.006)		(0.277)
Regional controls	No	Yes	No	Yes	No	Yes	No	Yes
Observations	44	44	46	45	42	42	45	44
R squared	0.828	0.879	0.713	0.882	0.462	0.525	0.518	0.664
F statistic	35.60	38.48	23.12	26.09	4.64	7.64	9.69	8.81
RMSE	0.663	0.556	1.248	0.803	0.266	0.249	10.40	8.39
First-stage F	12.42	13.14	18.42	15.09	16.10	13.12	18.45	15.14

Note: *** (**) [*] denotes significance at $p < 0.01$ ($p < 0.05$) [$p < 0.10$]; RMSE is root mean squared error

4 Social trust, institutions, and welfare states

To support our main argument, we next replicate two central results in the cross-country literature on social trust and add two other empirical regularities specifically connected to our argument. While our evidence is relatively simple, we nevertheless take extra care to show that these regularities are empirical indicators of *causal* effects of *current* social trust. This is important, since we argue that current trust protects the welfare state from potential problems that would make it fiscally infeasible.

Table 2 exhibits a set of estimates of the influence of social trust on legal quality and (the lack of) corruption, both capturing the strength of formal governance institutions, on (the lack of) confidence in politicians and the political system, which is likely to proxy for the support for overall policies, and on government size, which includes all government expenditures and transfers, thereby capturing the size of the welfare system; countries, sources and descriptives are reported in Appendix Tables A.1 and A.2.

We estimate the effects of social trust by two-stage least squares in order to show that the estimates are likely to reflect causality. As the instrumental variable, we use the trust of third-generation immigrants to the United States, as outlined above. We apply ancestral trust as an instrument and not as an independent variable since our argument is that *current* social trust affects *current* welfare state size and institutional characteristics. In this way, we avoid the possibility that trust and other factors are endogenously determined or that the partial correlations reflect claims of the reverse causality that welfare states and institutions

create trust. Furthermore, since our instruments predate the observations of legal quality, corruption, political confidence, and government size by approximately half a century, we interpret the estimates as indicators of long-run equilibrium outcomes. By estimating both the direct influence of trust on welfare state size as well as indicators of the quality of formal institutions supporting the welfare states, we remain agnostic about whether the bulk of the effect is direct or works through these institutions. All estimates include a simple set of control variables informed by the literature. The Appendix provides sources and descriptive statistics.

The table clearly shows the long-run influence of social trust. Not only are these findings statistically significant, but trust differences also appear to matter in a political and economic sense. Even though the source of identification is very different, our findings relating to legal quality and corruption are consistent with those in Bjørnskov (2010). In the long run, trust affects the quality of the legal system through higher bureaucratic quality—a supply of trustworthy bureaucrats unlikely to take bribes—and voters' limited acceptance of morally questionable behavior among politicians, which restrains rent-seeking problems in politics (cf. Knack and Keefer 1997; Knack 2002; Aghion et al. 2010).

A one standard deviation change in social trust—16 percentage points or approximately the difference between France and Germany—is associated with improvements to legal quality and corruption, and an increase in government size of approximately 45 % of a standard deviation; in other words, a 10 % difference in trust tends to result in a long-run difference of government spending of 4–5 % of GDP, or about half of the difference between spending in France and the UK. The same trust change is associated with an increase in political confidence of three-fourths of a standard deviation (note that confidence is coded such that high values indicate low confidence). As all estimates are purely cross-sectional and the sample predominantly consists of stable European countries, we interpret these findings as the cumulative long-run effects leading to a societal equilibrium. The effects of trust on, for example, government spending are thus necessarily effects that are also fiscally sustainable in the long run. Our results are therefore qualitatively similar to those in Bergh and Bjørnskov (2011). The estimates of legal quality and corruption are also consistent with a set of other results in the literature, suggesting that social trust becomes entrenched in formal institutions and governance structures in the course of a development process (cf. Putnam 1993; Uslaner 2008).

However, a main difference is that our estimates tend to be both larger and statistically more precise than previous studies due to the particular identification of the exogenous component to social trust through historical determination. In this way, our simple estimates suggest that high levels of social trust may have allowed nations to persistently collect very large shares of national income and redistribute it as well as to maintain a relatively well-functioning set of formal institutions. In Table 3, we test the degree to which these effects are likely to arise from direct mechanisms as well as their robustness.

First, we add legal quality, corruption, and political confidence to the control variables, thereby effectively holding constant for indirect transmission mechanisms. While we find no evidence of clear effects of institutional quality or confidence, we note that the inclusion of legal quality in particular induces sufficient variance inflation in a sample this size to make trust insignificant. However, the point estimate of legal quality is very small and accompanied by a large standard error. Conversely, neither the inclusion of corruption nor political confidence affects the estimate of trust to a significant degree.

In column 4, we perform an alternative robustness test. Our theoretical considerations suggest that social trust affects the level of government redistributive spending that is fiscally sustainable in the long run. However, as we use the 2008 level of government spending, we

Table 3 Indirect mechanisms and robustness

	Government size				Gov. consumption	Subs. and transf.	Credit rating
Log GDP per capita	6.962[**]	11.402[***]	5.483[*]	5.941[***]	3.044	3.272	−4.969[***]
	(3.155)	(3.948)	(2.939)	(1.964)	(2.420)	(9.204)	(1.301)
Openness	−0.052	−0.044	−0.048	−0.058[**]	0.035	0.108	−0.016
	(0.033)	(0.039)	(0.033)	(0.028)	(0.023)	(0.104)	(0.014)
Postcommunist	1.133	2.200	−0.116	2.948	2.817	5.401	−4.035[*]
	(6.666)	(7.248)	(6.707)	(4.239)	(3.178)	(9.871)	(2.451)
Log population	−3.169[***]	−3.886[**]	−3.639[**]	−3.146[***]	1.369[*]	5.753[*]	−0.827
	(1.242)	(1.626)	(1.653)	(1.089)	(0.792)	(3.225)	(0.626)
Common law	−4.748[*]	−0.827	−2.609	−1.794	−1.845	−16.506[***]	0.453
	(2.485)	(3.424)	(2.885)	(2.327)	(2.295)	(4.777)	(1.196)
Social trust	0.293	0.673[*]	0.412[*]	0.437[***]	0.269[**]	0.629[**]	−0.173[**]
	(0.337)	(0.388)	(0.221)	(0.148)	(0.113)	(0.263)	(0.069)
Legal quality	0.055						
	(3.769)						
Corruption		−3.596					
		(2.681)					
Political confidence			5.762				
			(5.496)				
Regional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	43	45	41	44	37	37	44
R squared	0.714	0.643	0.668	0.669	0.553	0.802	0.692
F statistic	8.91	10.93	7.80	20.04	21.95	28.91	19.02
RMSE	7.557	8.954	8.575	8.978	4.590	8.900	3.068
First-stage F	5.54	7.11	16.60	–	8.35	11.95	12.09

Note: [***] ([**]) [*] denotes significance at $p < 0.01$ ($p < 0.05$) [$p < 0.10$]; RMSE is root mean squared error. Results in column 4 are weighted by the log to the inverse of the December 2011 credit rating from Standard and Poor's

run the risk of estimating an effect of trust on what has proven ex post to be unsustainable spending. We therefore report results weighted by the credit ratings of all of the countries within our sample, through 2011. The credit ratings obtained from Standard and Poor's (2012) reflect the best market estimate of the credit risk and thus the long-run sustainability of the fiscal paths of countries.

Weighting observations with the logarithm to the credit rating difference to Greece—the country with the lowest rating (CC) in our sample—results in a slightly larger estimate, which is measured with substantially greater precision. Likewise, exchanging full government consumption with government consumption as a measure of total consumption in column 5, thus avoiding any bias due to normalizing data by GDP, also results in a significant effect. Nevertheless, the implied marginal effect of this estimate is somewhat smaller than that from using full government consumption. Focusing instead exclusively on government subsidies and transfers in column 6, we find a significantly greater effect. Again, this difference makes intuitive sense, since estimates using government consumption are arguably biased towards zero due to the inclusion of final consumption not associated with trust.

Finally, we focus on the hypothesized effects on the financing activities of the welfare state. One would expect, ceteris paribus, that high-trust countries would tend to have levels of welfare spending that can be funded in the long run, whereas low-trust countries would be more likely to choose high spending levels that cannot be sustained over time. In other words, regardless of the level of spending, the probability of not being credibly able to fund present spending programs would be higher in low-trust countries. In column 7, we find that relative to Greece, every 6 % decline in trust is associated with a one-point credit risk downgrade by Standard and Poor's. While data from 46 comparable countries around the world show that social trust tends to cause increased welfare state spending, the data therefore also support that this is likely to be a long-run equilibrium effect, as the assessment of their long-run sustainability by financial market actors is clearly associated with trust.

Consistent with these results and the main thrust of our argument, Heineman and Tanz (2008) find that high-trust countries are more likely to introduce reforms that improve legal quality and liberalize regulations. Bergh (2009) argues similarly for how the Scandinavian countries, Sweden in particular, have been able to maintain the welfare state by reforming parts that either worked against their official purposes or had become fiscally unsustainable. Likewise, Knack (2002) provides evidence from across the US states that voters in high-trust states are more likely to accept institutional reforms. In a similar vein, recent evidence in Aghion et al. (2010) shows that voters' demand for tight market regulations, in particular labor market regulation, is substantially higher in low-trust countries. In combination, these types of mechanisms expounded in recent contributions to the trust literature explain how the long-run equilibrium findings documented herein are reached.

5 Conclusion

The motivation for writing this paper was to investigate whether the size of welfare states is limited by already-existing stocks of social trust. The simple association between trust and welfare size has been noted by several papers in recent years, yet with different claims about causality. The unique feature of this paper is our historical identification strategy, which rests on the documented association between current national trust levels and trust among American third-generation immigrants with roots in a set of different nations.

First, simple empirical indicators from up to 46 countries suggest that the relatively higher levels of social trust observed in large welfare states most likely predate their advent. As most of the third-generation immigrants' grandparents came to the United States in the 1930s and 1940s and the trust levels of their children and grandchildren cannot logically be affected by institutional and policy changes in their "home countries" the component of trust that we are measuring is logically exogenous to welfare state policies.

Using this component as a strong instrument for present-day trust levels, after documenting the robust association between immigrant and national trust scores, our results suggest that social trust contributes directly to the continued existence and sustainability of larger welfare states together with the three features that are possibly necessary for their preservation: high levels of political confidence, strong legal institutions protecting private property rights, and low levels of bureaucratic corruption. Nevertheless, we mainly find clear evidence for direct effects of historically rooted social trust instead of direct effects mediated by present formal institutions.

The main finding of the paper is therefore that the missing link in explaining the long-run sustainability of large welfare states could be the existing stock of social trust predating

their very existence. This insight is in line with other recent studies documenting that history matters and seems a fruitful area for future research.

Appendix

Table A.1 Descriptive statistics, sources, and definitions

Variable	Mean	Std. dev.	Obs.	Source	Description
Ancestral trust	37.779	12.616	46	GSS (2010)	Trust score from immigrant group in US
Common law	0.239	0.431	46	CIA (2009)	Common law judicial system
Corruption	5.276	2.355	46	Transparency International (2009)	Corruption perception
Credit rating	8.431 (BBB+)	5.304	44	Standard and Poor's (2012)	Credit rating from AAA (1) to CC (21)
Government consumption	20.264	7.148	37	Gwartney and Lawson (2009)	Government consumption, share of total consumption in 2008
Full government expenditures	30.281	13.388	45	CIA (2009)	Full government expenditures
Income inequality	37.638	9.548	45	WIID (2010)	Gross income Gini coefficient
Legal quality	6.492	1.619	44	Gwartney and Lawson (2009)	Quality of legal enforcement
Log GDP per capita	9.084	1.140	46	Summers et al. (2006)	Logarithm to PPP GDP per capita, 2000 USD
Log population	9.913	1.330	46	Summers et al. (2006)	Logarithm to population size
Marginal tax				Sabirianova Peter et al. (2010)	Highest effective marginal tax rate on personal income
Openness	76.348	52.249	46	Summers et al. (2006)	Trade volume, percent of GDP
Political confidence	2.492	0.367	42	World Values Survey (2010)	Average rating of (lack of) confidence in legal institutions, four point scale
Post-communist	0.152	0.363	46	–	Formerly communist country
Protestant	0.185	0.278	46	CIA (2009)	Share of Protestants in population
Social trust	30.652	16.012	46	Bjørnskov (2008)	See text
Subsidies and transfers	10.907	7.923	37	Gwartney and Lawson (2009)	Government subsidies and transfers, share of GDP in 2008

Table A.2 Countries in sample

Algeria	Ireland	Romania
Austria	Italy	Russia
Belgium	Jamaica	Rwanda
Burkina Faso	Japan	Saudi Arabia
Canada	Lithuania	Senegal
Czech Republic	Malaysia	Serbia
Denmark	Mexico	Singapore
Egypt	Morocco	Spain
Ethiopia	Mozambique	Sweden
Finland	Netherlands	Switzerland
France	Norway	Thailand
Germany	Pakistan	Trinidad and Tobago
Ghana	Philippines	United Kingdom
Greece	Poland	Vietnam
Hungary	Portugal	
India	Puerto Rico	

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