Social Trust and Patterns of Growth

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21 February 2020

Abstract: The association between social trust and long-run economic growth is well-documented. However, which determinants of growth are affected by social trust remains an open question. This paper therefore explores to which extent social trust affects the rate of factor accumulation versus productivity improvements. Previous studies indicate that social trust could affect both the accumulation of physical and human capital and the rate of productivity increases. Existing literature also indicates that part of the growth effects may be due to how trust affects the quality of formal institutions. The effects of trust are estimated in a panel of 64 countries observed in five-year periods between 1977 and 2017, using growth accounting to separate patterns of growth. The results unequivocally show that social trust predominantly affects long-run growth by affecting the growth of productivity and that only a small share of that effect runs through the effects of trust on formal institutions.

Keywords: social trust, economic growth, economic development, institutions

JEL Codes: O10, N40, Z13

1. Introduction

Since the seminal work by Knack and Keefer (1997), economists have recognised that social trust is a robust determinant of long-run economic growth. Subsequent research has elaborated on the association, shown that it is at least as robust as other more broadly accepted determinants of growth, and explored under which conditions it applies (Whiteley, 2000; Zak and Knack, 2001; Beugelsdijk et al., 2004; Horváth, 2013). Putnam’s (1993) claim that social trust contributes to good governance and the quality of formal institutions has also held up in subsequent research, indicating that part of the trust effect may run through the consequences of formal governance institutions (Knack, 2002; Bjørnskov, 2018).

Yet, it remains an open question *how* social trust affects long-run economic growth and in particular if the effects mainly work through factor accumulation or factor productivity. Existing research finds evidence of both types of growth patterns, with some studies finding that trust is associated with the accumulation of both physical capital and education (Zak and Knack, 2001; Dearmon and Grier, 2011). However, other more recent studies indicate that social trust primarily affects growth through contributing to overall productivity (Akçomak and ter Weel, 2009; Bjørnskov and Méon, 2015). In addition, as noted by Bjørnskov (2012), it also remains an open question if trust affects economic performance directly, or if the effect is mainly indirect through the association between trust and the characteristics and performance of formal institutions. Specifically, social trust is known to be a determinant of judicial quality and regulatory performance, both of which may arguably affect growth and productivity (Boix and Posner, 1998; Knack, 2002; Aghion et al., 2010).

In this paper, I therefore employ growth accounting to decompose economic growth into factor accumulation and productivity growth in order to assess how social trust affects the composition of growth, i.e. how it affects the *growth pattern*. In the following, I first discuss how social trust might affect long-run growth. After describing the panel dataset covering 64 countries and a 40-year period, and outlining the simple estimation strategy, I present the results. The final section of the paper discusses the results and concludes.

2. How does social trust affect development?

The potential importance of cultural factors such as social trust was already realised by classical economists, including Adam Smith, David Hume and John Stuart Mill. In modern parlance, these economists emphasised the importance of transaction costs for economic performance, and the importance of trust for transaction costs (Bruni and Sugden, 2000). With the change of economics after World War I and the Keynesian and Samuelsonian revolutions, such topics disappeared from research in economics for a long time. Yet, with Putnam’s (1993) successful emphasis on features such as trust as explanations of the Italian North-South divide and beginning with Knack and Keefer’s (1997) seminal work, cross-country differences in social trust was back on the research agenda in economics and political science.

As surveyed in Bjørnskov (2018), the subsequent literature has argued for a range of different mechanisms through which social trust might affect economic growth. The overall association was quickly corroborated in cross-country analysis by Whiteley (2000) and Zak and Knack (2001), as well as by Dincer and Uslaner (2010) for the US sates, and later papers have successfully dealt with the inherent causality problem in different ways (Algan and Cahuc, 2010; Bjørnskov, 2012). A budding literature also deals with the conditions under which social trust have effects on growth, institutional quality and other aspects of society (Bjørnskov, 2018).

A number of papers since Knack and Keefer (1997) have taken Arrow’s (1972) conceptual paper as their starting point, associating social trust directly with reduced general transaction costs. An early example of formal theorising is Torsvik (2000) who hypothesises that “social capital”, defined as some form of voluntary associational network activity, can produce two forms of trust that both reduce transaction costs. While Putnam’s (1993) idea that social trust is created in voluntary associations has since been debunked, subsequent studies build on Arrow and Torsvik’s idea of lower *general* transaction costs leading to more productivity. A common idea is that the additional resources available in industries facing lower transaction costs are likely to be invested productively, and thus lead to more growth. In a recent paper, Van Hoorn (2017) shows that social trust also affects the particular comparative advantages that countries have and thus their particular export structure. Specifically, high trust countries tend to have comparative advantages in production that is more costly to monitor and niche products with non-contractable features. Several other papers also suggest that trust affects the efficiency of management and use of delegation of decision-making authority in the private sector (e.g., Bloom and van Reenen, 2010). While the particular contents of a country’s exports do not necessarily change its growth rate, this line of research suggests that social trust affects the structure of the economy.

However, another strand of the literature has explored the growth effects arising from the effects of trust on a set of *specific* transaction costs. Zak and Knack (2001) provided the first growth model with social trust as a constitutive element, focusing on the potential effect of trust on productive investments. In the model, a group of investment brokers work as financial intermediaries connecting individual savings with investment opportunities. However, with some probability reflecting the degree of trust or honesty in society, these brokers cheat their clients. Individual clients therefore face a choice between investing resources and using part of them to investigate brokers before choosing one. In low-trust societies, more resources are therefore spent investigating brokers – and thus ensuring that one is not cheated out of ones savings – and fewer resources are effectively invested. Higher levels of social trust in other words reduce a specific form of transaction costs by alleviating an information problem in the financial markets. In an AK-type growth framework, this implies that trust is positively associated with economic growth through its effects on the rate of capital accumulation. Both evidence presented in Zak and Knack (2001) as well as the later study by Dearmon and Grier (2011) show support for an association between trust and investments.

Bjørnskov (2009) presents a semi-endogenous growth model with similar features, but focuses on the accumulation of human capital instead of physical capital. He likewise develops a model in which social trust reduces transaction cost although in the context of human capital, the cost is associated with screening applicants for jobs that are not easily monitorable. In the model, firms bear the cost of screening applicants, as they otherwise risk employing individuals who will shirk in non-monitorable jobs. As this risk is decreasing in social trust, the screening costs are lower in high-trust countries and firms’ demand for education will therefore be higher in such countries. The main implication that the long-run growth of human capital will be higher in high-trust is confirmed in a set of empirical tests. Likewise, several studies find that education is causally associated with social trust (Papagapitos and Riley, 2009; Dearmon and Grier, 2011; Williamson and Mathers, 2011).

Yet, Knack and Keefer (1997) already in their original contribution emphasised yet another type of mechanism that focused on the length of individuals’ effective time horizons instead of transaction costs. Knack and Keefer implicitly assume that social trust is also reflected in the degree to which citizens can trust their politicians to pursue stable, sensible policies and maintain fair and effective judiciaries. Both features would enable individuals and firms to plan on longer time horizons, which would allow them to invest in new technology, human capital and additional skills. In this type of model, the particular type of costs affected by social trust are thus not transaction costs *per se* but economic costs associated with handling political uncertainty.

These models thus provide a mix of theoretical transmission mechanisms working through both factor accumulation and factor productivity. Yet, Whiteley (2000, 451) alternatively suggested that trust works by “reducing transaction costs and offsetting the effects of malign externalities. But it also works via interactions with human capital, physical investment and catch-up, all of which make a greater contribution to economic growth in a high trust society.” Whiteley’s first claim was that an environment of trust both facilitates other-regarding behaviour and Coasean bargaining solutions to common pool and other coordination problems. These types of mechanisms are similar to those covered by other studies, but his second claim was that trust also affects the marginal efficiency of factor inputs such as education and physical capital. While Whiteley only tested direct effects and left the question of whether trust also makes investments more effective, only Bergh and Bjørnskov (in press) have explored his second claim. They find no robust evidence that private investments are more effective in creating growth in high-trust countries, and even show that public investments in such countries are *less* effective.

Finally, a few more recent studies suggest that social trust mainly affects overall factor productivity instead of the rate of accumulation of production factors (Akçomak and ter Weel, 2009; Bjørnskov and Méon, 2015; Akçomak and Müller-Zick, 2018). A similarly diverse set of theories applies to the association between trust and productivity development. While some focus on the effects of transaction costs on the resources available for investments in innovation, others have hypothesised that social trust enables the sharing of knowledge, which in turn is conducive to innovative activity. However, the empirical results in Bjørnskov and Méon (2015) indicate that the major effects of trust on productivity are indirect, as trust affects institutional quality and good institutions protecting private property rights incentivise innovative activity.

As such, their study is an example of a different strand of the literature that instead explores whether the effects of trust on growth are mainly indirect. Boulila et al. (2008) for example find that the long-run effects of trust run through institutional quality while Bjørnskov (2012) identifies both a mechanism through institutions as well as another transmission mechanism through human capital investments. Similarly, as regulatory activity is known to affect productivity (Crafts, 2006; Bjugren, 2018), the much-cited study by Aghion et al. (2010), which shows that low-trust countries tend to implement more and more cumbersome regulations, indicates that social trust may be associated with higher levels of productivity through a regulations mechanism.

Finally, a small literature deals with a question related to institutional characteristics: whether the full effects of social trust on economic development are conditional on certain features of society. Knack and Keefer (1997) originally suggested that the effects of trust are largest in poor countries, which recent research in Jalil and Rabab (2017) corroborates. These studies thus suggest that social trust mainly affects the rate of catching up with richer economies, which could both occur through faster factor accumulation as well as a higher rate of adoption of modern technology. However, Peiró-Palomino and Tortosa-Ausina (2013) find the opposite result, Ahlerup et al. (2009) suggest that the effects are largest in countries with poor institutions – such that social trust and good formal institutions are substitutes – and Bjørnskov (2018) discusses indications that the main effects may be conditional on democracy.

Overall, the trust literature includes a rather diverse array of theoretical considerations as to how social trust affects long-run growth. Some of the contributions to the literature indicate that social trust mainly affects investments and education – i.e. growth through factor accumulation – while others either are consistent with or directly show an association between trust and productivity development. The next section therefore outlines how to separate these sources using growth accounting and the approach to estimating the relative contribution of trust through accumulation versus productivity.

3. Data and estimation strategy

In order to answer the main question posed in this paper, it is necessary to decompose sources of long-run economic growth. One way of doing so, which I use in the following, is growth accounting. Following Solow (1956, 1957), productivity is in principle easy to conceptualise through a Solow residual – the unexplained part of economic growth when the effects of the accumulation of capital, labour, and other factor inputs have been accounted for. Yet, all assessments and thus all decomposition of economic growth in practice necessarily rests on strong assumptions. For example, it remains uncertain how best to measure education, whether or not to account for quality differences in capital, and which functional form to employ. Fortunately, previous studies show that the practical consequences of different assumptions about the functional form of production are relatively limited (Aiyar and Dalgaard, 2009).

I therefore follow what currently appears as best practice by using the Penn World Tables, version 9.1, which offers a measure of the capital stock as well as an education index and data on both the number of equivalent full-time employees and the average number of annual work hours. This implies that the elements in the growth accounting identity in (1) can all be calculated from the Penn World Tables where *y* is real, purchasing-power adjusted GDP per capita, *k* is capital per full-time employee, *h* is the education index, *l* is the number of hours worked per capita, and *a* is calculated as a Solow residual from the rest. As in previous studies, I assume that *α*=.4 although I also provide robustness tests in which α is set at either .3 or .5 (Caselli, 2005; Bjørnskov and Méon, 2015).

$\hat{y}=\hat{a}+α\hat{k}+\left(1-α\right)\left(\hat{l}+\hat{βh}\right)+ε$ (1)

In the following, I estimate the determinants of the growth (the hatted variables) of *y*, *k*, *h*, *l* and *a* separately, and in particular the association between social trust and the growth of these factors. To do so, I use the standard questionnaire-based measure of social trust: the share of respondents who state that most people can be trusted when asked “In general, do you think most people can be trusted or do you have to be careful?” Although early studies questioned the survey approach to measuring social trust, and in particular which type of trust it effectively measures, more recent studies have supported it.

Social trust as measured in surveys for example correlates with individual behaviour in anonymised laboratory experiments (Cox et al., 2009; Sapienza et al., 2013) and real-life wallet-drop experiments (Knack and Keefer, 1997; Bjørnskov, 2019). Trust also persists over time, and potentially across several generations, as it appears to be transmitted stably from parents to children (Katz and Rotter, 1969; Uslaner, 2008), and is shaped by deep historical differences (Nunn and Wantchekon, 2011). Finally, several studies document that most respondents declare their trust in strangers when answering the question instead of known others (Uslaner, 2002; Naef and Schupp, 2009).

I supplement the trust data with the initial values of *y*, *l*, *h*, *k* and *a* in order to account for convergence effects. In addition, I also include the total trade volume and government spending, both as percentages of GDP, as most studies find that they are important long-run drivers of growth that are independent of social trust. These data are also from the Penn World Tables (Feenstra et al., 2015).

Finally, as a number of studies suggest that social trust mainly affects economic growth and performance through its effects on the quality of formal institutions, I add the overall index of rule of law from the *Varieties of Democracy* project, version 9 (Coppedge et al., 2016). In further robustness tests, I alternatively use areas 2 and 5 – the legal quality and regulatory freedom components – of the Economic Freedom of the World index (Gwartney et al., 2018). These additional results in the following thus effectively test for the potential importance of indirect mechanisms through which trust might affect growth.

All data are organised into consecutive nine five-year periods between 1972 and 2017, i.e. 1972-1977, 1977-1982, 1982-1987, 1987-1992, 1992-1997, 1997-2002, 2002-2007, 2007-2012, and 2012-2017, and summarised in Table 1. The full sample includes the 64 countries with available trust data and full data necessary for the growth accounting exercise in the Penn World Tables; these countries are listed in Table A1 in the Appendix.

*Insert Table 1 about here*

The estimation strategy is dictated by the approximate time invariance of the main variable, social trust. Given this problem, fixed effects models cannot be used as the fixed effects would perfectly capture the time invariant part of national trust scores. I therefore apply a random effects OLS estimator with a full set of period fixed effects. All data are organised into a panel dataset between 1972 and 2017 where I opt for reporting standard errors clustered at the country level.

In the following, I interpret all trust estimates as evidence of causal effects. While several papers have established that the association between social trust and long-run economic growth is causal, it may still be subject to simultaneity bias. Ananyev and Guriev (2019) for example find that substantial economic crises may lower social trust, which suggests that persistently negative growth could affect overall trust levels and thus lead to endogeneity bias in the following estimates. However, causality can nevertheless be gauged from the estimates despite the absence of credible instruments or other direct approaches to establishing causality. First, if endogeneity is a serious problem, estimates excluding observations in which growth was negative should be substantially different from estimates using the entire sample. Second, even if overall economic development affected social trust, the bias ought to affect all estimates equally and not only separate patterns of growth. As such, endogeneity or simultaneity bias, as it becomes reflected in the *average* social trust scores across the sample, would yield an approximately similar bias in all estimates and thus preserve any effects of trust on specific patterns.[[2]](#footnote-2)

4. Main results

I present the main results in Table 2, where the dependent variables in columns 1-5 are Δ log *y*, Δ log *l*, Δ log *h*, Δ log *k* and Δ log *a*, respectively. In column 1, the estimates show that the growth of labour and capital both are highly significant determinants of income growth while the development of education is not (however, see Pritchett, 2001). The estimate of the log to initial *y* is also negative and significant, and thus shows standard convergence (cf., Hauk and Wacziarg, 2009). Finally, social trust is positive and highly significant, indicating that at least a substantial part of the effect of trust must run through productivity growth. As argued above, this is highly unlikely to simply reflect simultaneity or endogeneity bias as trust only clearly affects a single source of growth.

*Insert Table 2 about here*

In the following columns, social trust proves insignificant for the accumulation of labour, *l*, and physical capital*, k*, while the estimate on education, *h*, is even significantly negative. In column 5 in which the growth of total factor productivity, Δ log *a*, is the dependent variable, the growth of the effective labour force and the initial levels are the only significant control variables. However, as indicated in column 1, social trust is strongly significant in the productivity regression with a coefficient that is also economically meaningful.

These estimates change only little and insignificantly so when controlling for the quality of formal institutions in the form of the rule of law. As reported in the lower panel of Table 2, the rule of law is significantly associated with the growth of *y*, *h* and *k*, and weakly so with *a*, yet its inclusion does not affect the point estimate of social trust. As such, the first results suggest that trust clearly affects not only economic growth *per se*, but also the pattern of growth. The size of the estimate is also approximately similar to those found in previous research, indicating that a one standard deviation trust difference is associated with approximately 20 % faster productivity growth, all other things being equal.

5. How robust are the patterns?

Table 3 repeats these estimates but excluding all observations in which a country was not fully democratic. This first takes care of worries that some development effects – and in particular those applying to consequences of formal institutions – may only apply to democracies (Bjørnskov, 2018). Second, it also handles the potential problem that autocracies may rig their national accounts and thus report misleading growth rates (Magee and Doces, 2015; Martinez, 2019). The estimates nevertheless remain similar and particularly the effect of social trust on productivity development remains highly significant and quantitatively very similar to that in Table 2.

*Insert Table 3 about here*

The main findings also hold up to a number of additional tests documented in Table A2 in the Appendix. First, a common concern when employing Solow residuals is that results can be sensitive to the particular assumption of α (in equation 1), i.e. of the particular assumption of production function. Yet, tests in which α is set at either .3 or .5 reveal qualitatively similar and strongly significant effects of social trust in the TFP regression. Second, tests reveal that the main results are also robust to excluding the 10 % observations with the lowest and highest trust scores, thereby corroborating that they are not driven by extreme trust observations. This test even results in a substantially larger point estimate of social trust.[[3]](#footnote-3) Similarly, a set of tests in Table A3 show that the main results are also robust to accounting for an estimated autocorrelation disturbance, which is inevitable with time invariant variables.

6. Are the effects conditional?

However, a final question is if the effects are conditional and whether the degree of conditionality depends on the particular measure of formal institutions. As noted in section 2, a number of papers hypothesise and find evidence that some effects of social trust are conditional on either democracy or initial levels of development. Others hypothesise that social trust and the quality of formal institutions are substitutes such that social trust is less important for growth when the formal institutions are good. In addition to the robustness tests documented here and in the appendix, I therefore provide tests of the productivity effects in Table 4 where I interact social trust with a set of conditions.

The results in column 1 indicate that trust may have a significantly smaller (but still significant) effect on productivity in democracies. The point estimate of trust in autocracies is .279 while the conditional estimate in democracies is .100; both are significant at p<.01. However, other interactions with the initial level of TFP – testing conditional convergence – and the rule of law index reveal no substantial differences. Conversely, consistent with the findings in Ahlerup et al. (2009), the interactions with institutional quality as measured by the Fraser Institute in columns 4 and 5 indicate substantial and clearly significant interaction terms (Gwartney et al., 2018). For both judicial quality (area 2) and regulatory freedom (area 5), social trust is significant at conventional levels at low levels of institutional quality while the conditional point estimates become small and insignificant for high levels of quality. Evaluated at the 25th decile of the distribution of judicial quality, the conditional point estimate of trust is .156 and significant at p<.01 while it is .047 at the 75th decile and fails conventional levels of significance (p<.23). While the conditional effects thus depended crucially on the choice of indicator, they suggest that social trust and institutional quality may be substitutes in the determination of productivity growth. This nevertheless does not reduce the role of social trust in societies with good institution, as the effects of trust on institutional quality are well-documented.[[4]](#footnote-4)

*Insert Table 4 about here*

Overall, these as well as further tests show that the conditional trust effects on productivity growth pass the same standard robustness tests as in section 5. In summary, the effects of social trust appear to run mainly through productivity development, and may be indirect in countries with relatively good political and judicial institutions.

7. Conclusions

This paper returns to the literature on social trust and long-run economic growth. While the overall association between trust and growth is well documented, it remains an open question whether the effect of trust on long-run growth is mainly due to effects on the rate of factor accumulation or on productivity development. In other words, this paper explores the effects of social trust on the *pattern* of long-run growth.

While this may appear to ask a rather narrow and specific question, it is far from irrelevant for our understanding of long-run development. It is important, as effects through factor accumulation are subject to decreasing marginal returns and thus signify different rates of catch up in the long run while effects through factor productivity imply permanently different steady states (Solow, 1956; Swan, 1956). Different *patterns* of growth may therefore have markedly different consequences for long-run *levels* of development.

The findings here strongly suggest that social trust mainly affects the development of productivity and only weakly affects the rate of factor accumulation, if at all. Analyses of overall growth suggest that social trust is significantly positively associated with growth, which is not the case for the growth of labour supply, physical capital or education. Conversely, trust is strongly associated with the development of productivity, measured as a Solow residual. The main results are also of economic significance, as they suggest that a one-standard deviation of social trust – approximately the difference between France and Germany – is associated with a productivity increase of about 20 % of a standard deviation. These findings are robust to a set of standard tests and appear conditional on the quality of formal institutions. This latter finding is nevertheless sensitive to the specific measure of institutional quality and thus require more research.

Yet, a number of other questions related to the development effects of trust still remain. For example, one might consider if there are specific conditions under which social trust becomes more important – as indicated in the last section – and whether there might be an optimal level of trust (cf. Butler et al., 2016). Similarly, for countries with poor formal institutions, it remains an open question exactly how trust affects their quality, and particularly whether trust mainly affects voters’ policy preferences or the reform ability of the political institutions (Pitlik and Rode, 2017; Bjørnskov, 2018). This paper only takes a single step towards understanding the broader consequences of cross-country differences in social trust.

Appendix

*Insert Table A1 about here*

*Insert Table A2 about here*

*Insert Table A3 about here*

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Table 1. Descriptive statistics

|  |  |  |  |
| --- | --- | --- | --- |
|  | Mean | Standard deviation | Observations |
| Δ log y | .114 | .127 | 554 |
| Δ log a | .044 | .099 | 477 |
| Δ log l | .010 | .066 | 477 |
| Δ log h | .142 | .334 | 576 |
| Δ log k | .105 | .116 | 544 |
| Log initial y | 9.568 | .905 | 544 |
| Log initial l | 6.695 | .185 | 481 |
| Log initial h | 2.604 | .602 | 553 |
| Log initial k | 11.807 | 1.045 | 553 |
| Log initial a | 4.376 | .318 | 476 |
| Social trust | .291 | .153 | 576 |
| Single-party regime | .104 | .306 | 576 |
| Multi-party autocracy | .134 | .340 | 576 |
| Democracy | .703 | .457 | 576 |
| Trade volume | .669 | .641 | 552 |
| Government size | .176 | .065 | 552 |
| Rule of law | .798 | .243 | 566 |

Table 2. Main results

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Δ log y | Δ log l | Δ log h | Δ log k | Δ log a |
| Δ log l | 1.099\*\*\*(.082) |  |  |  | .830\*\*\*(.078) |
| Δ log h | .049(.063) |  |  |  | .021(.062) |
| Δ log k | .593\*\*\*(.048) |  |  |  | .042(.052) |
| Log initial y | -.023\*\*\*(.007) | -.019\*\*\*(.007) | .016\*\*(.007) | .132\*\*\*(.030) |  |
| Log initial l |  | -.059\*\*\*(.019) |  |  |  |
| Log initial h |  |  | -.019(.012) |  |  |
| Log initial k |  |  |  | -.140\*\*\*(.030) |  |
| Log initial a |  |  |  |  | -.105\*\*\*(.019) |
| Trade volume | .022\*\*\*(.006) | .015\*\*(.007) | .009(.009) | .006(.011) | .015\*\*\*(.005) |
| Government spending | .015(.092) | -.124\*\*(.058) | .151\*\*(.069) | -.035(.175) | -.018(.083) |
| Social trust | .077\*\*\*(.026) | .010(.025) | -.059\*(.030) | -.087(.063) | .122\*\*\*(.029) |
| Regime FE | Yes | Yes | Yes | Yes | Yes |
| Period FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 477 | 477 | 477 | 477 | 477 |
| Countries | 64 | 64 | 64 | 64 | 64 |
| R squared within | .573 | .232 | .025 | .317 | .601 |
| R squared between | .682 | .198 | .489 | .247 | .285 |
| Wald Chi squared | 1117.67 | 78.94 | 99.41 | 464.87 | 909.52 |
|  |  |  |  |  |  |
| *Including formal institutions* |  |  |  |  |
| Rule of law | .069\*(.041) | -.025(.029) | .102\*\*\*(.041) | .199\*\*\*(.063) | .051\*(.028) |
| Social trust | .065\*\*\*(.026) | .014(.024) | -.070\*\*(.031) | -.128\*\*(.065) | .122\*\*\*(.034) |

Note: \*\*\* (\*\*) [\*] denotes significance at p<.01 (p<.05) [p<.10]; all regressions include a constant term. Numbers in parentheses are standard errors clustered at the country level.

Table 3. Results, only democracies

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Δ log y | Δ log l | Δ log h | Δ log k | Δ log a |
| Δ log l | 1.104\*\*\*(.102) |  |  |  | .865\*\*\*(.098) |
| Δ log h | .054(.096) |  |  |  | .030(.084) |
| Δ log k | .569\*\*\*(.055) |  |  |  | .058(.055) |
| Log initial y | -.026\*\*(.010) | -.013\*\*(.005) | .017\*\*(.008) | .151\*\*\*(.032) |  |
| Log initial l |  | -.069\*\*\*(.019) |  |  |  |
| Log initial h |  |  | -.019(.012) |  |  |
| Log initial k |  |  |  | -.154\*\*\*(.029) |  |
| Log initial a |  |  |  |  | -.109\*\*\*(.024) |
| Trade volume | .025\*\*(.012) | .015(.010) | -.006(.011) | -.014(.018) | .010(.009) |
| Government spending | -.018(.114) | -.127\*(.070) | .169\*\*(.072) | .192(.184) | -.042(.100) |
| Social trust | .057\*(.035) | -.007(.025) | -.077\*\*(.033) | -.101\*(.056) | .118\*\*\*(.038) |
| Period FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 371 | 371 | 371 | 371 | 371 |
| Countries | 58 | 58 | 58 | 58 | 58 |
| R squared within | .607 | .264 | .098 | .379 | .667 |
| R squared between | .525 | .027 | .163 | .149 | .191 |
| Wald Chi squared | - | - |  |  |  |
|  |  |  |  |  |  |
| *Including formal institutions* |  |  |  |  |
| Rule of law | .126\*\*(.054) | -.023(.043) | .083\*\*(.038) | .282\*\*\*(.096) | .081\*(.047) |
| Social trust | .048(.035) | -.006(.024) | -.078\*\*\*(.033) | -.130\*\*(.057) | .101\*\*\*(.038) |

Note: \*\*\* (\*\*) [\*] denotes significance at p<.01 (p<.05) [p<.10]; all regressions include a constant term. Numbers in parentheses are standard errors clustered at the country level.

Table 4. Interaction tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Δ log a | Δ log a | Δ log a | Δ log a | Δ log a |
|  | *Full baseline included* |
| Social trust | .279\*\*\*(.068) | .174(.353) | .194\*\*(.096) | .348\*\*\*(.102) | .466\*\*\*(.134) |
| Democracy | .045\*\*(.022) |  |  |  |  |
| Log initial a |  | -.103\*\*\*(.037) |  |  |  |
| Rule of law |  |  | .054(.040) |  |  |
| EFW area 2 |  |  |  | .020\*\*\*(.006) |  |
| EFW area 5 |  |  |  |  | .027\*\*\*(.007) |
| Democracy \* trust | -.179\*\*(.077) |  |  |  |  |
| Log initial a \* trust |  | -.011(.079) |  |  |  |
| Rule of law \* trust |  |  | -.094(.114) |  |  |
| EFW area 2 \* trust |  |  |  | -.039\*\*\*(.013) |  |
| EFW area 5 \* trust |  |  |  |  | -.055\*\*\*(.018) |
| Period FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 477 | 477 | 477 | 466 | 466 |
| Countries | 64 | 64 | 64 | 64 | 64 |
| R squared within | .601 | .602 | .601 | .613 | .608 |
| R squared between | .304 | .283 | .293 | .287 | .302 |
| Wald Chi squared | 832.80 | 908.53 | 970.38 | 670.86 | 615.27 |

Note: \*\*\* (\*\*) [\*] denotes significance at p<.01 (p<.05) [p<.10]; all regressions include a constant term. Numbers in parentheses are standard errors clustered at the country level.

Table A1. Countries included

|  |  |  |
| --- | --- | --- |
| Argentina | Hong Kong | Portugal |
| Australia | Hungary | Romania |
| Austria | Iceland | Russia |
| Bangladesh | India | Singapore |
| Belgium | Ireland | Slovakia |
| Brazil | Israel | Slovenia |
| Bulgaria | Italy | South Africa |
| Cambodia | Jamaica | South Korea |
| Canada | Japan | Spain |
| Chile | Latvia | Sri Lanka |
| Colombia | Lithuania | Sweden |
| Costa Rica | Luxembourg | Switzerland |
| Croatia | Malaysia | Taiwan |
| Cyprus | Malta | Thailand |
| Czechia | Mexico | Turkey |
| Denmark | Netherlands | United Kingdom |
| Ecuador | New Zealand | United States |
| Estonia | Norway | Uruguay |
| Finland | Pakistan | Venezuela |
| France | Peru | Vietnam |
| Germany | Philippines |  |
| Greece | Poland |  |

Table A2. Robustness tests

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Δ log a | Δ log a | Δ log a | Δ log a | Δ log a |
|  | No extremes | Area 2 | Area 5 | α = .3 | α = .5 |
|  | *Full baseline included* |
| Social trust | .204\*\*\*(.051) | .079\*\*(.039) | .099\*\*\*(.032) | .112\*\*\*(.029) | .112\*\*\*(.029) |
| EFW area 2 |  | .009\*(.005) |  |  |  |
| EFW area 5 |  |  | .011\*\*(.005) |  |  |
| Period FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 374 | 466 | 466 | 477 | 477 |
| Countries | 52 | 64 | 64 | 64 | 64 |
| R squared within | .639 | .609 | .608 | .671 | .514 |
| R squared between | .257 | .257 | .255 | .291 | .305 |
| Wald Chi squared | 804.17 | 671.49 | 611.84 | 1018.43 | 545.80 |

Note: \*\*\* (\*\*) [\*] denotes significance at p<.01 (p<.05) [p<.10]; all regressions include a constant term. Numbers in parentheses are standard errors clustered at the country level.

Table A3. Results, only democracies, autocorrelation disturbance

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Δ log y | Δ log l | Δ log h | Δ log k | Δ log a |
| Δ log l | 1.262\*\*\*(.066) |  |  |  | 1.024\*\*\*(.061) |
| Δ log h | .055(.087) |  |  |  | -.019(.085) |
| Δ log k | .567\*\*\*(.051) |  |  |  | .032(.049) |
| Log initial y | -.028\*\*(.008) | -.014\*(.007) | .019\*\*(.008) | .191\*\*\*(.024) |  |
| Log initial l |  | -.127\*\*\*(.027) |  |  |  |
| Log initial h |  |  | -.037\*\*\*(.010) |  |  |
| Log initial k |  |  |  | -.214\*\*\*(.022) |  |
| Log initial a |  |  |  |  | -.105\*\*\*(.017) |
| Trade volume | .029\*\*(.012) | .029\*\*\*(.011) | -.005(.009) | -.026(.019) | .023\*\*(.011) |
| Government spending | -.054(.088) | -.244\*\*\*(.082) | .148\*\*(.059) | .329\*\*\*(.125) | -.077(.089) |
| Social trust | .059\*(.034) | -.002(.031) | -.044(.028) | -.051(.061) | .086\*\*\*(.034) |
| Period FE | Yes | Yes | Yes | Yes | Yes |
| Observations | 371 | 371 | 405 | 405 | 371 |
| Countries | 58 | 58 | 58 | 58 | 58 |
| R squared within | .542 | .299 | .054 | .226 | .597 |
| R squared between | .481 | .006 | .167 | .205 | .153 |
| Wald Chi squared | 434.83 | 40.54 | 24.83 | 109.03 | 489.13 |
|  |  |  |  |  |  |
| *Including formal institutions* |  |  |  |  |
| Rule of law | .161\*\*\*(.049) | .015(.044) | .092\*\*\*(.036) | .347\*\*\*(.077) | .104\*\*(.042) |
| Social trust | .039(.035) | -.025(.029) | -.058\*\*\*(.028) | -.063(.062) | .060\*(.035) |

Note: \*\*\* (\*\*) [\*] denotes significance at p<.01 (p<.05) [p<.10]; all regressions include a constant term. Numbers in parentheses are standard errors.

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2. As such, the second argument is equivalent to causal identification through effect heterogeneity (Nizalova and Murtazashvili, 2016). The main difference is that the heterogeneity is not capture by an interaction but by differences across structurally similar regressions. [↑](#footnote-ref-2)
3. Conversely, deleting the 10 % observations with the lowest growth rates (all negative) results in a smaller point estimate, although not significantly so. Combining this with deleting the smallest and largest trust observations as in Table A2 yields larger estimates that are nevertheless all well within the confidence interval of the basic estimates. [↑](#footnote-ref-3)
4. Interestingly, in further tests that are not reported here but available upon request, social trust as a dependent variable turns out to be strongly and significantly associated with institutional quality in democracies, when measured by the Fraser Institute’s areas 2 (legal quality) and 5 (regulatory freedom), and the index of judicial accountability in the V-Dem database. While these findings are consistent with previous studies (cf. Bjørnskov, 2019), trust is nevertheless only weakly associated with the overall index of rule of law from the V-Dem dataset. Similarly, I find the same direction conditionality for *y*, *h* and *k* when the interacting variables are democracy, areas 2 and 5, or the index of judicial accountability, but not with the overall rule of law index. It thus remains a possibility that the absence of conditionality in Table 4 is due to conceptual ambiguity behind the rule of law index. [↑](#footnote-ref-4)