Trust and Credit*

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Abstract

Over the past 35 years, high-trust countries have experienced faster growth in credit to private sector. We model trust as a collective reputation to understand its role in shaping different credit growth paths. The co-existence of equilibria with different trust levels suggests distrust to be a self-fulfilling prophecy: borrowers in a "low-trust" equilibrium opting for strategic default, driving up population-average default rates and borrowing costs, forcing credit supply and switching into informal credit market, and ultimately limiting economic growth. Both country-level implications and micro-mechanisms are empirically investigated. In particular, distrust persistently predicts lower GDP growth, which can be partially explained by slower credit expansion; lower trust forces people's credit-related activities from financial institutions to private channels, either due to narrower formal inclusion or less active adoption. Our model also rationalizes the heterogeneous effects of financial regulation tightening under different trust levels, which discourages low-trust countries from imitating financial liberalization in high-trust economies. Empirically, financial liberalization corresponds to higher GDP growth in high-trust countries but lower GDP growth in low-trust countries, implying that regulation serves as an additional mechanism for credit divergence.

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1 Introduction

Kremer et al. (2022) documents unconditional economic convergence and prevailing convergence of economic correlates in the recent three decades. However, there are some exceptions: trust is highly persistent with no sign of convergence, and credit to the private sector has even further diverged. On the other hand, recent evidence reports that such divergence exhibits even against the catch-up effects in development of financial infrastructures and participant entities (e.g, He and You, 2023). These scenarios constitute a puzzle: how can private credit market perform a different growth pattern of divergence, regardless the convergence of its physical preconditions and the overall trend of economic growth? This discrepancy suggests potential influence of an alternative factor that could obstruct the transmission process. To this end, we propose the potential of trust as the influencing force, and rationalize the mechanism where heterogeneous levels of social trust shape the credit market in distinct ways, thereby leading to the observed divergence in credit growth.

We start by exploring the relationship among trust, credit, and economic growth in practice. First, high trust correlates more credit to the private sector and faster credit expansion since 1985; second, trust persistently predicts higher GDP growth, and this predictability can be partially explained by credit expansion. These facts motivate us to speculate that an economy has multiple equilibria where a high-trust equilibrium features high credit and economic growth, and an economy traps in a low-trust equilibrium with lower credit supply and GDP growth.

We present a simple and tractable model of an economy with private sector borrowers (e.g., entrepreneurs and individuals), lenders played by financial institutions (e.g., banks), and the regulator. Borrowers mix with honest, opportunistic, and fraudulent. Trust, measuring how likely a random person is trustworthy, is modeled as a *collective reputation* (Tirole, 1996) of the borrower crowd. The crowd changes over time, whereas the lenders can only characterize their matched clients by the collective reputation and then optimally determine interest rates. The regulator decides on policy tightness, incurs regulatory costs, and identifies defaults.

The theoretical framework reveals several key insights. Firstly, distrust can be a self-fullfilling prophecy — the borrower cheats as much as possible, the collective reputation of the borrower deteriorates, and lenders need to charge a higher interest rate under information asymmetry to compensate for the loss from default, thus further reducing the incentive to behave honestly. Secondly, the low-trust equilibrium can co-exist with the high-trust equilibrium under the same parameter space. Such a co-existence helps explain the long-standing variation of trust across countries and the divergence of macroeconomic indicators predicted

by trust. This also implies that trust is not a proxy for other economic factors. Thirdly, there is heterogeneous effect of tightening regulation on economic growth. Low-trust countries benefit more from tight rules. Interestingly, under specific parameter ranges, the effects of tight regulation can be opposite between high and low-trust countries — loose regulation favors high-trust countries, while strict policies favor low-trust countries.

We further examine the economy with an alternative private credit market, where borrowers get credit based on in-group trust rather than the collective reputation of social trust. Good borrowers are more inclined to take advantage of their personal trust without being represented by a collective reputation. As a result, bad borrowers drive out good from the formal credit market. Banks thereby suffer larger default loss and increase interest. This mechanism is exacerbated in the low-trust scenario so that enhance the gap between low-trust and high-trust equilibria. The model also allows for a variety of extensions. First, we discuss the role of regulation tightness in a long run. It could rule out the low-trust equilibrium and thus restore the social trust. Deregulation thereafter would still keep the economy growing at a high rate. This echoes with typical cases in financial history, such as the 2008 crash. Then, we highlight the importance of building credit history. It allows for more social investment and declines the social cost of restoring trust.

All the model implications are empirically examined. We start from the country level by investigating the relationship between trust and the main financial activities of the private sector, including borrowing, saving, and credit card usage. The analysis shows that individuals in low-trust countries are less inclined to borrow from financial institutions. Such a variation has even enhanced in the past ten years. As a substitution, citizens of low-trust countries are more likely to turn to personal social networks, i.e., borrow from family or friends. This cross-country variation is also widening. We further use the proxy, the difference between the share of people borrowing from financial institutions and acquaintances, in panel regressions, to analyze the choice between two approaches of borrowing, separating from the effect of borrowing demand size. It appears a huge cross-country variation from -53% to 69%, implying huge differences in private borrowing patterns across countries. Importantly, trust differences substantially explain this phenomenon. The above findings are also significant in saving activities. Individuals in low-trust countries are more akin to saving through informal channels, such as friends, saving stores, and clubs, while in high-trust countries, saving at financial institutions is so common that informal approaches to savings, such as saving clubs, barely exist in these countries. Additionally, trust serves as a robust explanation for the variations in personal credit card ownership rates across countries and for the widening of these gaps.

The country-level findings lead to a crucial inference: the substantial disparities in the size and growth of credit between low-trust and high-trust countries are not solely attributed to differences in the demand size for relevant financial activities — the private sector in low-trust countries would have had greater demand for financial activities such as borrowing. However, much of this demand is not channeled through financial institutions, but is absorbed by informal channels and social networks of acquaintances. Therefore, the country's trust level is closely linked to credit growth thus affects economic growth. This observation helps rationalize various macroeconomic phenomena, including the divergence of credit growth, the predictability of trust for economic growth, and the interpretation of this predictability by credit growth.

According to the model implications, the flow from formal credit market to informal channels can be owing to both personal preference and rejections by financial institutions. That is, Financial institutions in low-trust countries have a narrower inclusion, whereas people in low-trust countries generate less preference and adoption of financial institutions.

We then empirically explore individual-level surveys to examine the micro-mechanisms. Evidence for the former micro-foundation comes from the questions on individual's access to emergency funds. Although it is not feasible to determine their preferences between formal and informal channels, it is certain that people whose answer is "impossible" have borrowing demands but are rejected by all channels including financial institutions. The empirical results imply that, all else given, the financial institutions could accept 17-point-percentage more of the country's population, comparing the countries with highest and lowest trust. The result remains qualitatively robust considering country-level, historical, and individual-level controls and the multinomial probit specification that allows for correlations among choices. We find direct evidence for the second micro-foundation from the another series of questions. The respondents without bank accounts are asked to provide reasons, in which "lack of trust in banks" is one of the options. The regressions imply that one standard-deviation decrease in the economy's trust level is associated with a 4-point-percentage increase in the average probability of individuals reporting their distrust in banks. Considering the overall low probability of this cause, the trust discrepancy constitutes a sizable impact.

The second part of our empirical investigations relates to regulation. We extend the time dimension of the global bank regulation and supervision data set to two decades in light of Barth et al. (2013), and then link it to trust. The analysis uncovers three progressive observations. First, the tightness of regulation varies worldwide, and there is little evidence of convergence of national regulation policies over the past two decades. This suggests the absence

of a universally optimal regulatory solution, leaving room to explore explanations for these cross-country disparities. Second, we obtain the pooled negative relationship between trust level and tightness. Low-trust countries prefer (or are at least associated with) adopting tighter regulation. This aligns with our theory: the impact of regulation varies across economies with different trust levels. However, we claim that the reliability of this empirical finding is limited, as in practice, the determination of regulation may face numerous considerations and external forces. To this end, our third empirical test focuses on the step-back corollary: the resulting effect on economic growth of regulation tightening varies across countries. Interestingly, the correlation between regulation tightening and economic growth is not worldwide-significant, but significantly positive in low-trust groups and negative in high-trust groups. Therefore, high-trust countries exhibit a notable trend where liberalized financial regulation leads to faster GDP growth. In contrast, low-trust countries demonstrate faster GDP growth under tighter regulation.

Literature. Our paper contributes to three strands of literature. First, our paper contributes to recent literature on new patterns of economic convergence and the persistent divergence of financial development. With this branch of literature emerging in the 1990s, the main finding is that there is no absolute economic convergence (e.g., Barro, 1991; Barro and Sala-i Martin, 1992; Pritchett, 1997). As documented by Kremer et al. (2022), it appears a recent trend towards unconditional convergence since 1990 and convergence since 2000 despite the overall longer-period history of divergence, along with many correlates of growth, e.g., human capital, policies, and institutions, also converged and moved in the direction associated with higher income. Such absolute convergence is also documented by Roy et al. (2016); Patel et al. (2021). However, credit to the private sector diverged from 1985 to 2015. Meanwhile, deeply-rooted cultural variables, such as trust, have no convergence. Interestingly, while there are further discussions on the findings of the recent convergence (e.g., Pande and Enevoldsen, 2021; Acemoglu and Molina, 2022), the divergence of institutional variables and financial development is widely recognized. On the other hand, financial development significantly contributes to economic growth, during which Greenwood and Jovanovic (1990) highlights the important role of financial intermediation. The seminal works of King and Levine (1993a,b) provide cross-country evidence supporting Schumpeter's hypothesis that financial systems are crucial for promoting economic growth. Concurrently, Fung (2009) observes that the synergistic relationship between financial development and economic growth tends to wane as economies mature, suggesting that low-income countries with underdeveloped financial sectors are at

risk of remaining in poverty. This perspective gains further support from a meta-analysis spanning 67 studies (Valickova et al., 2015). He and You (2023) examines the convergence of two groups of financial development indicators, suggesting that there is convergence in financial inclusion (e.g., physical infrastructures and participating entities), implying catch-up effects, but divergence in the performance of a large set of financial activities. The combination of above findings generates the puzzle as we mentioned, suggesting potential for alternative transmission mechanics from financial inclusion development to financial performance, especially credit markets, and further economic growth. This therefore relates to literature on convergence or divergence in economies with credit market imperfections (e.g., Banerjee and Newman, 1993; Acemoglu et al., 2006; Lin et al., 2020). Unlike these works, we introduce cultural correlates into the operation of credit market. In particular, we provide a theoretical explanation of why trust enters the mechanism and can generate multiple equilibria in which credit supply never converges.

Second, our paper enriches the dialogue on the role of trust in shaping financial systems (e.g., La Porta et al., 1997; Guiso et al., 2006, 2008; Gennaioli et al., 2015; Bottazzi et al., 2016; Gennaioli et al., 2022). Among the literature focusing specifically on credit, the studies by Duarte et al. (2012); Moro and Fink (2013) are particularly relevant. They provide empirical evidence on the role of trust in identifying borrowers and facilitating access to credit. Our model contributes to this discussion by illustrating the potential for multiple equilibria in trust levels and lending. It underscores the reasons why trust evolves slowly and continues to be a significant predictor of financial outcomes.

Third, this paper is linked to literature on the cultural component of economic growth. Zak and Knack (2001) shows that trust predicts economic growth. Algan and Cahuc (2010) uncovers the causal effect of trust on economic growth by focusing on the inherited component of trust. We show that lack of trust might limit entrepreneurs from grabbing economic opportunities to do business, as banks need to impose tighter rules and charge higher interest rates to compensate for loss from fraud. We offer one possible mechanism to explore why distrust might dampen economic growth. More broadly, this study is part of the literature on cultural variation in economic preferences and attitudes (e.g., Knack and Keefer, 1997; Inglehart and Baker, 2000; Guiso et al., 2009; Fehr, 2009; Voigtländer and Voth, 2012; Desmet et al., 2017; Enke, 2019; D'Acunto et al., 2019).

Our study also adds to the literature on the heterogeneous effects of regulation. Literature shows the wide variation and bare evidence for the convergence of bank regulatory and supervisory policies (Barth et al., 2013). Recent research shows that stricter regulations

have different effects across countries. Bosio et al. (2022) shows that tighter regulations only improve outcomes with tighter rules with low public sector quality. Our paper shows that tighter rules particularly benefit low-trust economy and spurs economic growth. This also relates studies that combine policy, cultural motivations, and economic impacts, particularly in credit (e.g., Peek and Rosengren, 1995; Djankov et al., 2006; Dobbin et al., 2007; Gersbach and Rochet, 2017).

The remainder of this paper is structured as follows. Section 2 outlines motivating facts. Section 3 introduces the theoretical framework and draws testable implications. Section 4 describes the data sources and summary statistics. Section 5 presents empirical evidence on how trust is associated with credit supply and financial inclusion. Section 6 discusses the empirical tests that connect regulation tightness with trust. Section 7 concludes.

2 Motivating Facts

We obtain domestic credit to private sector credit (% of GDP) from World Development Indicators from 1985 to 2015. Trust data is from the World Values Survey (WVS) — the percentage of respondents agree that "most people can be trusted," to be detailed in Section 4. We start with documenting three motivating facts among trust, credit, and economic growth.

Fact 1: Trust correlates with higher credit to the private sector in 1985 and also faster credit expansion since 1985.

Figure 2 plots the relationship between trust and credit. Panel (a) relates credit growth in 1985-2020 to the credit level in 1985. Although there is a positive correlation between the initial credit level and its subsequent growth, the predictability is relatively low. This suggests potential for other factors to play a role in shaping differences in credit growth across countries. Panels (b) and (c) connects trust and credit. We observe a 14% correlation between credit in 1985 and trust levels. Furthermore, trust strongly predicts credit growth from 1985 to 2020, implying that trust is a significant factor influencing credit dynamics over this period.

Fact 2: Trust persistently predicts faster economic growth, whereas credit expansion partially explains such predictability.

Our sample contains 78 countries after merging WVS trust data with WDI GDP data. Consistent with Kremer et al. (2022), we find β-convergence in these three decades with a coefficient of -0.102 ($s.e.$=0.052) in Table 1 Column (1).

$$log(GDP_{i,t_2}) - log(GDP_{i,t_1}) = \beta log(GDP_{i,t_1}) + C + \epsilon_i. \tag{1}$$

Zak and Knack (2001) shows that trust predicts higher economic growth in episodes 1970-1992 and 1980-1992, but with little economic convergence by then. Does trust predict economic growth in more recent data, and how does it relate to economic convergence? First, we include trust in our specifications as the following:

$$log(GDP_{i,t_2}) - log(GDP_{i,t_1}) = \alpha Trust_i + \beta log(GDP_{i,t_1}) + C + \epsilon_i. \quad (2)$$

Consistent with literature, trust can still predict higher economic growth — one s.d. increase in trust corresponds to 0.168% (= 1.12×0.15) higher GDP growth per year. The β-convergence after controlling for trust becomes even stronger from -0.102 ($s.e.$=0.052) to -0.179 ($s.e.$=0.065). It is well-documented that trust positively correlates with development level, and thus, trust counteracts the economic convergence documented in Kremer et al. (2022).

$$log(GDP_{i,t_2}) - log(GDP_{i,t_1}) = \alpha Trust_i + \beta log(GDP_{i,t_1}) + \gamma(Credit_{i,t_2} - Credit_{i,t_1}) + C + \epsilon_i. \quad (3)$$

Then, we further explore the role of credit growth in the trust component of economic growth. We merge credit growth data and end up with 41 countries in our sample with valid credit data in 1985.[1] Within these 41 countries, the conditional convergence β is -0.224 ($s.e.$=0.088), and the coefficient for trust is 1.52 ($s.e.$=0.618). We have two new observations: (i) higher credit growth significantly predicts a larger economic growth (0.620, $s.e.$=0.246); (ii) after controlling the credit growth, the coefficient of trust drops to 0.728 ($s.e.$=0.645) — credit growth from 1985-2015 explains about half of the predictability of trust in GDP growth.[2]

Fact 3: Trust exhibits persistence within country during 1981-2022.

Figure 3 plots how the trust level changes within each country over time. During the past four decades since 1981, WVS has released 7 waves. Most in-sample countries participated in more than one wave, which allows us to observe changes in trust within the country. We plot the trust in wave t_1 and the corresponding trust in the next applicable wave t_2 for the same country. The resulting scatters stay closely around the 45-degree line, regardless the values of t_1 and $t_2 - t_1$. This implies that the trust level is relatively persistent within a country, making the trust levels lack of convergence across the world during a long period.

These facts motivate us to hypothesize that an economy possibly resides on "low-trust" and "high-trust" growth paths with different equilibrium credit provisions and economic growth levels, and trust levels can be self-sustained in different equilibria. Our theory is consistent

[1] 37 countries are dropped as the credit to private sector data in 1985 is missing.

[2] Table IA1 presents the robust tests with different sample periods. The two findings remain to hold with the explanatory power similar to the baseline.

with the observation that trust is slow-moving and has no sign of convergence over time despite policy correlate convergence documented in Kremer et al. (2022). In equilibrium, a high trust level enables leveraged economies to provide even more credit to the private sector, resulting in divergence in lending and potentially other financial development metrics.

3 Theory

This section develops a simple model to formally introduce trust in the process of accessing credit. In our model, lenders incur losses when a private borrower cheats and defaults, while distrust is defined as the perceived probability of being cheated.

3.1 Model Setup

Imagine one unit of borrowers borrowing from a lender (say, a bank). The lender has no information about these borrowers and needs to rely on the collective reputation to decide the interest rate r to cover the default loss. Only projects that deliver returns over r are willing to borrow money.

3.1.1 Borrower, Fraud, and Matching

A continuum of borrowers (entrepreneurs) of unit measure includes three types: Honest α, opportunistic β, and fraudulent γ.[3] $\alpha + \beta + \gamma = 1$. α honest borrower never cheats. β opportunistic borrowers assume that they will permanently stay in the market and choose to cheat or not from the benefit-cost trade-off. γ fraudulent borrowers characterize short-sighted (also short-lived) agents that always default for insolvency.

Each borrower exits randomly with probability E and is replaced by a new firm with no previous record. Each investor is matched to a new lender every period, and the lender cannot investigate the borrower's record. Thus, lenders must rely on the regulator to discover frauds and infer the probability of a fraudulent borrower based on the *collective reputation*.

A borrower optimally chooses the borrowing amount to invest in the business opportunities R with return rates r ($r \geq 0$). r satisfies the probability density function $f(r)$. Naturally, $\mathbb{E}(R) < \infty$, i.e., the total investment return is finite.

[3] The setup of type is similar to Tirole (1996), which studies the binary choice of task delegation. In our model, investors can choose continuously according to their perceived probability of being cheated.

3.1.2 Lenders

The lender is risk-neutral, with a discount factor of δ. Lenders are competitive and offer the same interest rates in equilibrium. Two possible interest rates r_B and r_G depend on the society-level default probability.[4] Under a competitive market, the interest rate compensates for the default loss.

3.1.3 Regulator

The regulator dictates the rule of law — the probability of detecting fraud in the past record. The regulator scrutinizes the entire borrowing history and broadcasts fraudulent behavior to lenders. Cheating is *caught* by the regulator with probability τ, $\tau \in [0, 1]$; that is, borrowers with fraud records can still run the business as the honest ones with probability $(1 - \tau)$. A higher τ implies a tighter regulation; the regulator detects more frauds and signals to investors. If a borrower is signaled as fraudulent, the borrower will lose access to the lending market and derive zero utility.

The economic growth is proxied by the average profitability net of interest rates minus the social cost (C) for enforcing regulation τ, as the lender is assumed to be zero-profit. Thus, lenders do not spur economic growth as all revenue is used to offset the default loss. The borrowers or entrepreneurs who do not default deliver economic growth.

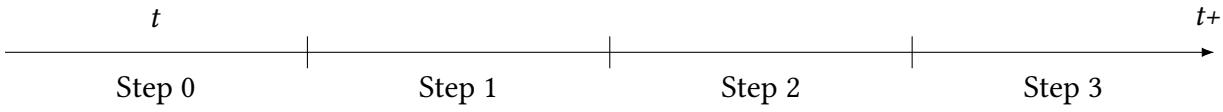
Our core assumption is that the regulator reviews the full transaction history with a constant detection rate τ. Once an opportunistic borrower cheats, the borrower will cheat in all future periods until the regulator detects the fraudulent behavior. The cost of cheating is constant by our assumption of the constant rate of detection discovery. Thus, there is no incentive to repay the interest in the future as being honest cannot avoid being detected by the regulator.[5] Thus, we only need to consider the trade-off where a borrower always cheats or never cheats.

3.1.4 Timeline

The timeline in each period t is characterized as the following:

[4] B and G correspond to low-trust (bad) equilibrium and high-trust (good) equilibrium, respectively, which will be introduced later.

[5] The same logic also applies in Tirole (1996) where x_i is an increasing function of i's past cheating behaviors.



E borrower stays in the lending market; $(1-E)$ borrowers randomly die; $(1-E)$ new borrowers are born with no prior record.

Regulator investigates borrowers' behaviors in $t-1$, determines whether a borrower cheated, sends information to lenders.

Lenders learn whether the matched borrower is fraudulent, reject fraudulent applicants, form belief in default probabilities for clean borrowers, determine interest r based on belief.

Borrowers determine the borrowing quantities according to r.

3.2 Equilibrium

We consider two pure strategy equilibria. One is a high-trust economy where all opportunistic borrowers are honest. Under high-trust equilibrium, investors perfectly trust borrowers, efficiently invest in risky domestic assets, and detect no fraud.

The other equilibrium is a low-trust economy where all opportunistic borrowers cheat. In this case, the regulator cannot catch all frauds; thus, investors distrust borrowers as the ones with clean records can cheat.

3.2.1 High-Trust Equilibrium

The high-trust equilibrium is the benchmark without distrust inefficiency — only γ investors always cheat. $E\gamma\tau$ investors are detected by the regulator, and only $E\gamma(1-\tau)$ fraudulent investors have clean records and can obtain the loans. Among $(1-E)$ new borrowers, $(1-E)\gamma$ new fraudulent borrowers enter the economy. In aggregate, $(1-E\gamma\tau)$ borrowers have a clean slant. The equilibrium default loss is $D_G = \frac{E\gamma(1-\tau)+(1-E)\gamma}{1-E\gamma\tau} = \frac{\gamma-E\gamma\tau}{1-E\gamma\tau}$. The interest compensates for the default loss, $r_G(1-D_G) = D_G$, which yields

$$r_G = \frac{\gamma}{1-\gamma}(1-E\tau). \tag{4}$$

Remarks. *Under the high-trust equilibrium, there are always $1-\gamma$ economic agents engaged in productive tasks. The γ is the unavoidable default loss originating from the non-performing or firm bankruptcy. The implicit intuition is that although the defaulted entrepreneurs also invest and obtain returns, they, together with unfunded entrepreneurs, do not deliver economic growth, as they offset the interest payments made by those successful entrepreneurs.*

To maintain a high-trust economy with r_G, an opportunistic borrower must have enough incentives to maintain a good reputation rather than risk themselves with frauds inspected by the regulator.

If a borrower defaults, the borrower takes the principal away in the current period and risks being detected by the regulator in the future. For the future period t, the borrower can survive with probability $[E(1-\tau)]^t$ and keep extracting principles or caught by the regulator and derive zero utility.

If a borrower chooses not to default, she will only invest in projects with return $r > r_G$. The fraudulent does not pay back any money, implying that all the projects with $r > 0$ is beneficial. However, the fraudulent needs to pretend to be "good" and only claim for the same borrowing demand as if she would not default. The incentive constraint can be written as follows:

$$\int_{r_G}^{\infty} f(r) r \mathrm{d}r \frac{\delta}{1-\delta E(1-\tau)} \leq \int_{r_G}^{\infty} f(r)(r-r_G)\mathrm{d}r \frac{\delta}{1-\delta E}, \tag{5}$$

which can be rearranged as

$$\frac{1-\delta E+\delta E\tau}{\delta E\tau} r_G \leq \frac{\int_{r_G}^{\infty} f(r) r \mathrm{d}r}{\int_{r_G}^{\infty} f(r)\mathrm{d}r} = \frac{\mathbb{E}(r|r>r_G)}{1-F(r_G)}, \tag{6}$$

where $F(\cdot)$ is the corresponding cumulative distribution function of $f(r)$.

Remarks. *The incentive constraint (6) is interpreted as follows: the R.H.S. captures the nature of investment opportunities. The denominator is the quantity of opportunities that offering return higher than r_G, whereas the dominator is the expected overall return of these opportunities. Thus, the R.H.S. represents the average return r conditional on $r > r_G$. The L.H.S. can be revealed as an effective value of interest to pay after considering the discount, die out, and the opportunity cost of "default without being caught". Consequently, β borrowers chooses to be honest if and only if the effective interest to pay is lower than the average return. Note that the L.H.S. decreases in τ even under the same r_G. This indicates the potential roles of the regulation, which will be discussed later. In addition, the borrowers consider the average return instead of marginal return, since once they choose to default, they would default all the loans rather than only the exceeding part.*

The economic growth is the social-average investment returns minus the social cost (C) to

enforce the regulation level of τ:

$$\begin{aligned} g_G &= \frac{1}{2}(1-\gamma)(\mathbb{E}(R) - r_G) - \tau C, \\ \Rightarrow g'_G(\tau) &= \frac{1}{2}(1-\gamma)\frac{E\gamma}{1-\gamma} - C = \frac{1}{2}E\gamma - C. \end{aligned} \tag{7}$$

3.2.2 Low-Trust Equilibrium

In a low-trust economy, all opportunistic borrowers choose to cheat— only $\beta+\gamma$ investors always cheat. $E(\beta+\gamma)\tau$ is the number of borrowers caught cheating and lost access to the lending market, and $E(\beta+\gamma)(1-\tau)$ fraudulent borrowers still hide with clear records. The rest of the borrowers $(1-E(\beta+\gamma)\tau)$ have a clean slant. $(1-E)$ new borrowers, and $(1-E)(\beta+\gamma)$ frauds in the low-trust equilibrium.

The equilibrium default loss is $D_B = \frac{E(\beta+\gamma)(1-\tau)+(1-E)(\beta+\gamma)}{1-E(\beta+\gamma)\tau} = \frac{(\beta+\gamma)-E(\beta+\gamma)\tau}{1-E(\beta+\gamma)\tau}$. The corresponding interest rate satisfies $r_B(1-D_B) = D_B$, i.e.,

$$r_B = \frac{\beta+\gamma}{1-\beta-\gamma}(1-E\tau). \tag{8}$$

Remarks. *Intuitively, the interest in the low-trust equilibrium $r_B > r_G$ given the same survival rate E and regulation τ, as the lender needs a higher interest to cover the larger default loss: under the low-trust equilibrium, there are only $1-\beta-\gamma$ economic agents engaging in the productive tasks. The $\beta+\gamma$ entrepreneurs not funded or defaulted do not deliver economic growth, and they offset the interest payments made by those successful entrepreneurs.*

If a borrower defaults, the borrower takes the principal and keeps cheating in all future periods until being caught by the regulator. If a borrower chooses not to default, she will only gain $\int_{r_B}^{\infty} f(r)(r-r_B)\mathrm{d}r\frac{1}{1-\delta E}$ in every period. Under the low-trust equilibrium, the opportunistic borrowers choose to default, therefore the incentive constraint can be written as:

$$\int_{r_B}^{\infty} f(r)r\mathrm{d}r\frac{1}{1-\delta E(1-\tau)} \geq \int_{r_B}^{\infty} f(r)(r-r_B)\mathrm{d}r\frac{1}{1-\delta E}, \tag{9}$$

$$\Rightarrow \frac{1-\delta E+\delta E\tau}{\delta E\tau}r_B \geq \frac{\mathbb{E}(r|r>r_G)}{1-F(r_G)}. \tag{10}$$

The economic growth in the low-trust equilibrium reads

$$\begin{aligned} g_B &= \frac{1}{2}(1-\beta-\gamma)(\mathbb{E}(R)-r_B)-\tau C, \\ \Rightarrow g_B'(\tau) &= \frac{1}{2}(1-\beta-\gamma)\frac{E(\beta+\gamma)}{1-\beta-\gamma}-C=\frac{1}{2}E(\beta+\gamma)-C. \end{aligned} \tag{11}$$

The incentive constraints (6) and (10) show that the existence of equilibria is determined by the parameter space given the investment environment, $f(r)$. Particularly, the parameter space allows potential for the co-existence of the two equilibria. To pin down a specific constraint for better understanding of the co-existence and further analytical discussions, we assume $f(r)$ follows an exponential distribution, $f(r)=\lambda e^{-\lambda r}$, $r \geq 0$ and $\lambda > 0$,[6] which captures the following characteristics: (i) $f'(r) < 0$, i.e., fewer business opportunities can survive as the required return increases; (ii) the (inverse) scale parameter λ approximately captures the overall businesses returns, as $\mathbb{E}(R)=\frac{1}{\lambda}$, whereas a higher λ indicates that there are relatively more low-return opportunities.

Figure 1 intuits the comparison and conditions for existence of the two equilibria. Panel (a) compares the low-trust and high-trust economies. The economic surplus shrinks to the blue triangle as the interest rate increases from r_G to r_B. The yellow trapezoid captures the economic welfare loss, which comes from two sources: borrowers need to pay higher interest rates, and fewer business opportunities are taken under a low-trust environment. Panel (b) illustrates an example where two equilibria coexist. The black dashed line (LHS) refers to r_X, while the blue curve (RHS) refers to $\frac{\delta E\tau}{1-\delta E+\delta E\tau}\frac{\mathbb{E}(r|r>r_G)}{1-F(r_G)}$. Then the incentive constraints (6) and (10) require that when r_X equals r_G (r_B), the blue curve lies above (below) the black line.[7] By calculating (4) and (8), we draw the corresponding dotted lines in panel (b), showing that they fit the constraint respectively.

Proposition 1 analytically solves the parameter space that allows the high and low-trust equilibrium exist simultaneously.

Proposition 1. ***Multiple Equilibria.***

[6] The distribution $f(r)$ defines on the semi-infinite interval $[0,\infty)$ since borrowers would never borrow money for negative-return businesses.

[7] With any specific forms of $f(r)$, the equilibrium condition can also be visualized by Figure 1 (b). In Appendix, we discuss how $f(r)$ affects the coexistence in detail. Briefly, there are distributions that allow for at most one equilibrium.

The economy can be either high-trust or low-trust when

$$r_G \leq \frac{\delta E \tau}{\lambda(1-\delta E)} \leq r_B, \tag{12}$$

which is equivalent to the parameter condition

$$\frac{1}{\frac{\lambda(1-E\tau)(1-\delta E)}{\delta E \tau}+1} \in [\gamma, \gamma+\beta]. \tag{13}$$

Remarks. *Distrust is a self-fulfilling prophecy: low trust induces the lender to charge a higher interest rate to compensate for the default loss. A higher interest rate makes default relatively more attractive, rather than keeping clean records. Once the collective reputation of borrowers is terrible, the new-entry borrower would suffer from the spillover from the existing low-trust environment.*

(12) brings an additional observation: as r_G and r_B is not affected by the businesses' distribution $f(r)$ but only the crowd, the scale λ only enters the middle term. Furthermore, a large λ might rule out the high-trust equilibrium by making $r_G > \frac{\delta E \tau}{\lambda(1-\delta E)}$. The intuition is that when most businesses do not earn enough money, people realize that maintaining a good record at financial institutions is less useful, and even less profitable than the direct benefits of default. Thus, the social reputation falls to the low-trust scenario. In contrast, a society with more beneficial businesses tends to rule out the low-trust equilibrium.

Proposition 2. ***Heterogeneous Effect of Regulation.***

A tighter rule benefits low-trust economy more than high-trust economy, i.e., $g'_B(\tau) - g'_G(\tau) = \frac{1}{2}E\beta > 0$*, particularly when* $C \in (\frac{1}{2}E\gamma, \frac{1}{2}E(\gamma+\beta))$ *a tighter policy spurs growth in the low-trust economy but discourages growth in the high-trust economy.*

Remarks. *A tighter rule can detect more frauds so that fewer borrowers with clean records default less, and lenders can charge a lower equilibrium interest rate to enable higher economic growth. For a low-trust economy, the regulator has a stronger incentive to scrutinize the borrowers, reduce the interest rate more effectively, and make borrowers more profitable.*

This proposition reveals some equilibrium aspects of the real world. The regulator can potentially liberate regulation in a high-trust economy to maintain the high-trust equilibrium to cut administrative costs; the opportunistic borrowers can still be honest as they prefer to get access to the lending market. However, in the low-trust equilibrium, regulators are more rewarded for tightening regulations and reducing interest rates. The best practice of regulations

should depend on the trust level — in the range of $C \in (\frac{1}{2}E\gamma, \frac{1}{2}E(\gamma+\beta))$, tightened regulation might benefit the low-trust economy but slow down economic growth in the high-trust economy.

3.3 In-Group Trust and Alternative Access to Credit

A natural in-depth discussion on trust is its radius. By definition, the mentioned society-level trust is more consistent with out-of-group trust, as we assume lenders cannot reveal borrowers' true type as long as borrowers' fraudulent behaviors. We denote in-group trust of each borrower as $q \in [0,1]$ — the subjective probability of *not default* conditional on the private information, i.e., the "trustworthiness" of the borrower. Correspondingly, there exists a private lender that grants loans based on the in-group trust. While out-of-group trust relates to formal credit supply, in-group trust corresponds to alternative informal access to credit, e.g., borrowing from close network such as community or friends.

The in-group trust q is determined for each borrower and does not suffer from information asymmetry (Guiso et al., 2008). Therefore, the opportunistic borrowers could never strategically default in the private market but would be fully enforced.[8] For simplicity, we assume the borrowers' in-group trust is independent with their type and satisfies a uniform distribution.[9] From another perspective, this ensures that the financial institution has completely no information about individual's in-group trust.

The representative private lender can require a profit margin of $\bar{r} \geq 0$ as it has monopoly power over the borrower. She optimally chooses $\bar{r}$ to maximize the expected total profit after taking into account the costs other than default loss (e.g., liquidity loss and opportunity cost of personal investment), which are reduced to proportion $\sigma > 0$ of her total lending. Since there is no chance for borrowers to default but not caught, the lending process is a one-shot deal. The offering personal interest r_P satisfies $qr_P = \bar{r}$, which implies that more trustworthy borrowers receive lower personal interest rates r_P. When q is high enough, the borrower switches from financial institutions to informal channels as the formal interest rate covers too much spillover of others' default to be lower than r_P.

Consider the equilibria with the existence of alternative informal credit market. The financial institution's interest rate may also change to $\tilde{r}_X$ ($X \in \{B, G\}$) as it face a different crowd of borrowers. Lemma 1 proves the existence and uniqueness of the new high-trust and low-trust

[8] From another perspective, lack of in-group trust can be understood as a risk of being unable to repay loans.

[9] One may think the fraudulent borrowers have smaller in-group trust q in average. We have tested that this character does not affect the qualitative results below, and even enhances the effects discussed below. Thus, we assume the independence for simplicity.

equilibrium, respectively.

Lemma 1. ***Equilibrium with Informal Channels.***

With the existence of informal credit market, the equilibrium in the high-trust (low-trust) case is still existing and unique. The financial institution faces a larger share of default borrowers with the existence of informal channels. Precisely, there exists a unique $\rho_X > 1$ *for each* $X \in \{B, G\}$ *s.t.*

(i) in the new high-trust equilibrium, the shares of three types of borrowers faced by financial institutions are $\frac{\alpha}{1+(\rho_G-1)\gamma}$, $\frac{\beta}{1+(rho_G-1)\gamma}$, *and* $\frac{\rho_G\gamma}{1+(\rho_G-1)\gamma}$;

(ii) in the new low-trust equilibrium, the shares of three types of borrowers faced by financial institutions are $\frac{\alpha}{1+(\rho_B-1)(\beta+\gamma)}$, $\frac{\rho_B\beta}{1+(\rho_B-1)(\beta+\gamma)}$, *and* $\frac{\rho_B\gamma}{1+(\rho_B-1)(\beta+\gamma)}$;

(iii) the new interest rate $\tilde{r}_X$ *satisfies*

$$\tilde{r}_X = \rho_X r_X > r_X, \tag{14}$$

and $\tilde{r}_X$ *is independent with the private market* $\bar{r}$*;*

Remarks. *The informal alternative is less attractive for borrowers who aim to default, since they value an excess opportunity cost of undetected default in formal channels. Consequently, the lender needs to increase the interest rate to cover the enhanced default loss due to the relative decline of good borrowers. In line with practical intuition, the determination of the interest rate does not undergo the influence of the informal interest rate, because individual trust is decoupled from collective reputation, then all three types are subject to the same switch proportion due to changes in private interest rates.*[10]

Denote there are Q_X borrowers getting credit from informal channels in the new X (good or bad) equilibrium. Q_X may include both fraudulent and good borrowers. Proposition 1 and 2 still hold. In addition, we obtain the following comparisons between Q_G and Q_B.

Proposition 3. ***Informal Channel under Different Equilibria.***

In the low-trust equilibrium, more borrowers adopt the informal channel, i.e., $Q_B > Q_G$.

Remarks. *Although both high and low-trust equilibria suffer from the outflow of "good" borrowers, the financial institutions in low-trust economies are affected more, since there are more default borrowers. As such, the institution needs to raise the interest rate more sharply. This make more borrowers turn to informal channels, as the financial institution charges too much spillover adjustments on the interest rate which exceeds the informal channel rates for more borrowers.*

[10] When financial institutions partially obtain the information of in-group trust, the two interests may be jointly related to the distribution of in-group trust, which is beyond our focus.

The self-fulling prophecy of distrust expands with the existence of informal credit access. A larger number of honest borrowers do not adopt the financial institutions as they receive higher unfair interest rates, leaving a formal credit market with high interest rates and rife with defaults. From the perspective of growth, the continuously existing large outflow of borrowers decreases the credit scale and growth. Furthermore, in practice, the informal credit market may generate a lower efficiency for economic growth, as the private lenders have the pricing power of $\bar{r}$ for maximizing private earnings.

3.4 Extension

3.4.1 Regulation Tightness and Equilibrium

In practice, tight regulation might temporarily limit the credit supply and bring large social costs, yet benefits the economy as a whole in a long term. The key mechanism is that sufficient tight regulations penalizes defaults heavily, which gradually leads to a well-shaped collective reputation and, generate higher economic growth as a result. Our model also rationalizes this phenomenon. Recall Proposition 1, although the interest rates are also affected by the regulation, the incentive constraint (12) can be rearranged as

$$\frac{\gamma}{1-\gamma} \leq \frac{\delta E \tau}{\lambda(1-\delta E)(1-E\tau)} \leq \frac{\beta+\gamma}{1-\beta-\gamma}, \tag{15}$$

where the satisfaction of the first (second) inequality is equivalent to the existence of a good (bad) equilibrium. A more strict regulation τ increases the threshold monotonically and narrows down the applicable interval of the bad equilibrium.

Proposition 4. *The low-trust equilibrium is ruled out when the regulation is tight enough to satisfy*

$$\tau > \frac{1}{E + \frac{\alpha\delta E}{\lambda(1-\alpha)(1-\delta E)}}. \tag{16}$$

Remarks. *The lower limit in (16) could decrease by three forces: (i) a larger share of honest borrowers, i.e., a larger α; (ii) more profitable businesses opportunities, i.e., a smaller λ; (iii) more traceable credit records, i.e., a larger E. These three social characteristics all lead to lower default rates naturally without regulation, among which the third force seems non-straightforward and will be discussed in the following. However, since τ is defined as a probability of detection, there might be cases where the lower limit exceeds 1 so that regulation fails to help.*

The role of regulation tightness coincides with what we learn from financial history. For example, trust in banks was at a low following the widespread bank failures in US 1930s. This was followed by strong regulation of banks and credit growth was strongly managed. But this state transitioned to a deregulated state that also coincided with an increase in trust. That is, tight regulation was used to restore trust and then followed by credit growth for higher economic growth. On the contrary, loose regulation might lead the economy to the low-trust equilibrium with a large default scale. Akerlof and Shiller (2010) talks about deregulation before the 2008 crash. In 1999, the Gramm-Leach-Bliley Act, also known as the Financial Services Modernization Act, repealed the Glass-Steagall Act of 1933, and allowed banks to use deposits to invest in derivatives. Then, the Commodity Futures Modernization Act exempted credit default swaps and other derivatives from regulations in the following year.[11] These changes unleashed an acquisition spree by allowing the combination of traditional bank lending with trading, securities and insurance activities. These deregulatory practices are seen to have ultimately accumulated the 2008 crash. This is not the first time that people observe deregulation fuels bubbles and crashes: a particular form of displacement that shocks the system has been financial liberalization or deregulation in Japan, the Scandinavian countries, Mexico, and Russia (e.g., Kindleberger, 1987). Deregulation has led to monetary expansion, foreign borrowing, and speculative investment. A further supporting evidence is that after the Dodd-Frank Act in 2010, the trust level appeared to have a slow but continuous increase, as reported by the Financial Trust Index,[12] even after the partial repeal in 2018. This again illustrates the role of regulation tightness in a long time span.

3.4.2 Building Credit History

The survival rate of E captures the credit history. On the contrary, $(1 - E)$ indicates the portion of a "new" business entry with no previous record. If the social credit system is more robust, more past information can be kept and reviewed by the lender, leading to a higher E. Recall Proposition 4, sufficiently tight regulation could rule out the low-trust equilibrium, with the lower limit decreasing in E. In particular, E enters the threshold in two forms, independently and tied to the discount δ. The latter is trivial, as the value of E relates to the length of the discrete period. However, the former suggests that E affects the economy not only from natural extinction in the time series, but the cross-sectional knowledge of credit

[11] The detailed report is also seen in press releases, e.g., `https://bettermarkets.org/newsroom/dodd-frank-and-deregulation-some-lessons-history/`.

[12] For details about the index, please see `http://www.financialtrustindex.org/index.htm`. This also suggests that the changes in trust need significantly longer time than credit growth.

records. Essentially, the E old borrowers have lower conditional probabilities of default than the $(1-E)$ new borrowers, since they have survived from one round of detection. The two influence paths act the same direction. Then a higher E relates to a lower expected default loss. Therefore, it decreases banks' interest rates no matter in the high or low-trust equilibrium, and consequently, decreases the social cost (i.e., required tightness of regulation) of restoring trust.

4 Data and Variables

Our data for empirical tests are mainly collected from three widely used series of surveys and databases: the World Values Survey, the Global Financial Inclusion (Global Findex) Database, and the Bank Regulation and Supervision Survey. These surveys and databases yield data on trust, financial inclusion, and regulation policies, respectively. Table 2 summarizes the key variables.

World Values Survey. The World Values Survey (WVS) consists of questionnaires for individual respondents. It includes a series of questions on respondents' trust in other people. Following a common approach, we calculate country-level (economy-level) *general trust* as the pooled average of respondents' answers to the questions. According to the question description, the proxy can be interpreted as the share of respondents in the economy who believe that most people can be trusted. This has been widely applied in research to measure trust, and has been shown to measure the same thing experimenters call "trust" in the lab (Johnson and Mislin, 2012). To expand the sample size, we collect all the seven waves of WVS until 2022, as well as the latest wave of the European Values Survey (EVS).[13] Figure 3 shows the persistence of trust within country during the waves. Therefore, similarly with relevant literature, we treat trust level as a persistent country-level index and use the pooling averages of all the waves. The resulting sample set contains 112 economies with applicable trust data. Figure IA1 visualizes the distribution of trust around the world.

In addition to general trust, WVS includes six sub-questions on respondents' trust in specific kinds of people (Delhey et al., 2011), corresponding to six additional proxies of trust. Following Enke (2019), we divide the six proxies into two groups, namely in-group and out-

[13] Official guidelines approve this integration. As the release notes show: "World Values Survey time-series dataset can be merged with the time-series data-file of the European Values Study creating the *Integrated Values Surveys* data-file." We collect WVS Time Series (1981-2022) and Joint EVS/WVS 2017-2022 to obtain our data set. Please see `https://www.worldvaluessurvey.org/WVSDocumentationWVL.jsp` for a detailed description.

group trust. The *in-group trust* is the average level of respondents' trust in families, friends, and people they know, whereas the *out-group trust* measures respondents' trust in people they meet for the first time, people from other regions, and foreigners. The difference in trust levels between the two groups allows us to further rationalize how trust influences an individual's financial activities. As our model illustrates, people can alternatively seek the help of in-group channels, while out-group trust is more likely to influence people's access to public financial institutions (FI). Therefore, in addition to using the general trust, we also use out-group trust and the difference in trust (out-group minus in-group) in empirical tests. Table 2 and Figure IA2 show the statistics of these proxies. The general trust and the in/out group trust range from 0 to 1. Naturally, people have less trust in out-groups, making the difference in trust typically negative.

Global Financial Inclusion Database. The Global Findex Database (FINDEX), published by the World Bank, has becoming the definitive source of data on global access to financial services since 2011. There are four waves as of 2023, each of which releases country-level and individual-level databases. We directly use the official country-wave panel in economy-level analyses and merge the four waves of microdata as repeated sections for individual-level tests. Both sample sets are merged with trust proxies at the economy level.

The economy-level database contains 402 observations (economy × wave). We are interested in people's average borrowing and saving choices, credit card and bank account ownership, indexed by the corresponding share of respondents within the economy. Take borrowing as an example: the respondents are asked if they borrowed from financial institutions (FI) or family or friends in the past year. Since each respondent can adopt both choices, the two population shares within an economy could have common trends, which is more related to the economy's general development and the aggregate borrowing demand. To this end, we define *borrowing difference* as the population share of borrowing from FI minus the share family or friends. As our model illustrates, people who have borrowing demands but do not adopt institutions (either voluntary or forced) switch to informal channels. Borrowing difference then captures such phenomena separately from the common trend. As Table 2 shows, the borrowing differences have a zero mean, but range from -0.53 to 0.69. Similarly, the *saving difference* ranges from -0.27 to 0.65, indicating huge variation in people's borrowing and saving choices among economies. One of our main interests is to test the relationship between trust and such variations.

The individual-level database contains 388,860 observations, each representing one re-

spondent's answers to the FINDEX questionnaire. Table 2 the main variables including individual characteristics (e.g., gender, age, income level and education), and the answers to two specific questions. The first question is the source of individual's emergency funds. Respondents are required to choose the most fitting answer among six options, including *impossible*, (from) *financial institutions*, and (from) *family or friends*, etc.[14] Second, respondents report the reasons for not having an account, where one of the possible reasons is the lack of trust in banks. Besides summarizing the raw data, Table 2 also reports the economy-wave average of individual-level answers. There are also large variations across the world, leaving room for country-level explanations such as social trust.

Bank Regulation and Supervision Survey. The main goal of merging regulation data is to test our model implication that the different trust levels lead to different optimal regulation tightening choices and heterogeneous impacts on economic growth. The data is collected from the Bank Regulation and Supervision Survey (BRSS) by the World Bank, a unique source of comparable country-level data on how banks are regulated and supervised in over 180 countries. The survey respondents are regulatory officials around the world. Barth et al. (2013) make extensive and in-depth efforts to compile the series of BRSS. They use the answers to hundreds of individual survey questions from BRSS to construct a set of indices and consequently construct six summary indices of the major categories of bank regulatory and supervisory policies. We follow Barth et al. (2013) to update the whole index set and focus on three of these indices that are highly relevant to this paper: *overall restrictions on bank activities*, *entry into banking requirements*, and *bank capital regulations*.[15] The updated database allows us to observe the changes of regulation around the world over a 20-year period. Table 6 reports statistics and implications, which will be discussed later.

Additional variables. The variable corresponding to credit growth is obtained from the Word Development Indices (WDI) by the World Bank. Precisely, *credit* in Section 2 refers to domestic credit to private sector (% of GDP). Annual GDP data collected from the World Bank

[14]The relevant questions only appear in the latest two waves of FINDEX. In wave 2017, the question is separated. Respondents first answer if they are possible to gain emergency funds in 30 days. The respondents who answer "Yes" further answer the most possible source. In wave 2021, these two questions are combined into one, where "impossible" appears as an option. We process them into uniform format (the same as wave 2021). The raw options included credit and withdrawal from FI, which we have combined as sources from institutions.

[15]Thanks to the online database provided by Barth et al. (2013), we directly obtained the data from the first four waves, which were completed in 1999, 2002, 2006, and 2011, respectively. Further, we follow their construction approach and update the indices to the fifth wave of BRSS completed in 2019.

is used as a proxy of the general development level, where log GDP per capita, corresponding historical values, and growth rates are used in specific discussions. Additional country-level (time-varying and historical) controls include infrastructures, geographic and human factors (e.g., the average amount of ATMs / bank branches per 1,000 km / 10,000 adults) are collected from the Financial Access Survey (FAS) published by International Monetary Fund (IMF). *Region*, used for fixing regional effects, is categorical and defined by the World Bank.[16]

5 Trust and Private Financial Activities

This section starts by empirically testing the role of trust in shaping the economy-average private financial activities related to credit (e.g., borrowing, saving and credit card ownership), i.e., low trust is associated with small credit scale, weak credit growth, and more informal credit activities. We further find evidence for the two micro-mechanisms that align with our model predictions: in low-trust economies, financial institutions (FI) narrow down inclusion, whereas individuals are less voluntary in solving credit demand via FI.

5.1 Economy-level Phenomena

Borrowing. Figure 4 visualizes the correlation between trust and borrowing decisions, where each country×year observation constitutes one point. The positive-sloped fit in Panel (a) shows that individuals in low-trust economies are less inclined to borrow from FI, whether due to bank rejections or personal non-preference. Additionally, the blue points (corresponding to 2021) are higher than red points (2011) in general, indicating an increasing trend in borrowing through FI across all countries over time. This reflects the overall banks' enhancing inclusion and adoption and furthermore the global financial development. During this process, the variations among the countries with different trust levels are further amplified — high-trust countries experienced a significant larger growth, and the linear fit of observations in 2021 exhibits a steeper slope than 2011. In contrast, as Panel (b) shows, individuals in low-trust economies are more inclined to borrow from family or friends, and such variation remains and even exacerbates over the ten years. This suggests that low-trust economies do not lack of borrowing need that much, but these demands are somehow being addressed by informal or private channels.

[16] In precise, high-income countries are in a separate category. The rest of the economies are divided into six regions by geographic nature, i.e., East Asia & Pacific (EAP), Europe & Central Asia (ECA), South Asia (SA), Sub-Saharan Africa (SSA), Latin America & Caribbean (LAC), and Middle East & North Africa (MENA).

Table 3 Panel A conducts regressions on economy×wave panel with additional controls and fixed effects. Since respondents have the ability to utilize two borrowing channels simultaneously, the two shares have common components related to the aggregate borrowing demand. To separately examine how borrowing activities, influenced by trust, shift between these two channels, we use *borrowing difference* (the share of borrowing from FI minus the share family or friends) as the dependent variable in columns (1)-(5), and the corresponding changes over time as the dependent variable in columns (6)-(8).

The main independent of interest is the country-level trust. The significant positive estimated coefficients confirm the intuitions from Figure 4: individuals from high-trust economies exhibit a greater propensity to borrow from FI rather than informal channels such as family or friends. Moreover, this phenomenon has been expanding over the years, with high-trust economies experiencing a more rapid increase in the scale of institutional borrowing. To account for national economic development levels, we introduce historical GDP as a proxy. Wave (time) and region effects are also fixed. In column (5), we add controls for financial infrastructures, geographic and demographic factors, such as the average number of ATMs or bank branches per 1,000 km or 10,000 adults, for isolating these objective factors that may generate non-adoption. In column (8), we further control for the dependent variable in the previous wave to account for potential marginal effects. The results remain robust.[17]

We delve deeper by examining the distinction between trust in the out-group and trust in the in-group as Table IA2 reports. Individuals' utilization of public FI is expected to be more connected to out-group trust, whereas in-group trust influences their inclination to rely on familiar people. Consistently, after controlling the general trust level, the estimated coefficients of the trust difference (out-group minus in-group) in all columns are significant and positive, providing additional support to above intuitions.

Saving. We go on a similar path to explore the relationship between trust and saving choices. Figure 5 panel (a) shows significant positive relationship between trust and population share of saving at FI, and such phenomenon expands over years. As for saving at informal channels (e.g., saving club, family/friends, stores), there is an interesting preliminary finding: in several high-trust economies, respondents were not even asked about their participation in informal saving, as evident from the missing data points in panel (b). This occurrence aligns with the questionnaire formulation principles of FINDEX, suggesting that in these countries, informal

[17]We do not report the results of the regression model of column (8) with historical controls, since the applicable sample size is further reduced. The results, however, still hold.

saving practices are virtually nonexistent or extremely rare. In addition to this, personal safekeeping exists as an implicit alternative that reduces the overall savings needs, making the population share of informal saving is generally relatively small, in line with common understanding. Even then, low-trust economies exhibit notably high shares and significant increments in informal savings. In these economies, a substantial portion of saving needs remains unmet by FI.

Table 3 Panel B regresses the share of saving at FI on trust.[18] The significant positive estimated coefficients confirm the intuitions obtained from the figure and show robustness with general economic development levels, geographical and human factors, wave and region fixed effects. Furthermore, Table IA3 shows that out-group trust generates excess predictability to the population share of saving at FI: in economies where people are more likely to trust strangers from the broader society, the individual saving needs are more successfully addressed by FI.

Credit card ownership. Similar with previous tests, Figure 6 and Table 3 Panel C examine the relationship between trust and the population share of owning a credit card. A substantial number of low-trust economies consistently exhibit low credit card ownership rates, whereas high-trust economies tend to experience a faster inclusion development and achieve larger credit card coverage. The significant positive estimated coefficients of general trust and out-group trust in the panel regressions confirm these implications.

So far, economic-level tests have revealed a common pattern: trust, as a social and cultural factor, is positively related to the coverage of individual financial activities by formal FI. In particular, individuals in low-trust economies tend to resort to informal channels and rely on their social networks, such as families or friends. This implies that the disparity between low- and high-trust economies in terms of the scale of financial activities facilitated by FI is not solely attributable to a lack of demand. Rather, it can be partly explained by the substitution effect, where informal acquaintance channels serve as alternatives.

[18]Unlike borrowing, we do not use *saving difference* as the dependent for two reasons: (i) as Figure 5 shows, there are many missing samples of informal saving, and especially cause selection bias with respect to trust levels; (ii) the additional alternative for saving, i.e., personal safekeeping, make it less meaningful to test the difference, as it does not separate switching effects from the aggregate demands. In the online appendix, we also test the relationship between trust and the lack of informal saving questionnaires in Table IA5. The results show that high-trust economies have greater possibilities of not being asked about informal savings, further inferring that informal savings are more likely to be almost non-existent in these economies. Furthermore, low-trust economies are more inclined to rely on informal alternative of saving.

5.2 Micro Mechanisms

As our model illustrates, the switch to informal channels are motivated from two sides: FI's narrowing inclusion and individuals' refusing adoption. Here we use these two terminologies to emphasize the initiatives that institutions and individuals have, respectively. The inclusion channel indicates that in a low-trust economy, FI tends to impose stricter criteria for providing financial services in order to compensate for default loss. This results in a narrower pool of individuals who can access these services. On the other hand, the adoption channel indicates that "normal" individuals in low-trust economies are aware of the institutions' response to the low-trust nature. They perceive that their own risk is overestimated by FI. Therefore, they do not believe that FI can provide them with fair financial services and turn to acquaintances where personal in-group trust takes the place of collective reputation. In the following, we provide individual-level evidence for both mechanisms.

5.2.1 Lower Trust and Narrower Inclusion

We find micro-evidence for the inclusion channel in individuals' sources of emergency funds, which reflect the difficulty of borrowing from various sources. We are especially interested in whether it is impossible to obtain emergency funds, and the more possible source between FI or acquaintance. In the baseline, we treat these options separately with the following general probit specification:

$$Pr(Y_{ikt}|X_{ikt}, K_{kt}) = \Phi(\alpha + \beta \times Trust_k + X'_{ikt} \times \gamma + K'_{kt} \times \delta + \eta_t + \epsilon_{ikt}), \tag{17}$$

where $Trust_k$ is the general trust level of economy k. X_{ikt} includes the following individual-level controls: gender, age, income level, education level, and ownership of the personal account. K_{kt} are economy-level controls, including log GDP per capita, financial infrastructures, geographical factors such as average amount of ATMs / bank branches per 1,000 km / 10,000 adults, and the historical characteristics. η_t is the wave fixed effect.[19] Φ is the standard normal CDF. The dependent, Y_{ikt} is a dummy which equals to 1 if and only if the individual i interviewed in wave t from economy k reports that Y is the most possible source for her to gain emergency funds. That is, when analyzing one specific option Y, all the other categorical options result in zero. This approach offers convenience in interpreting the coefficients, whereas the multinomial probit model (MNP) approach shown below accounts for fairer assumptions

[19] With the wave fixed effect, the model is reformulated so that the intercept is interpreted as the average value of the fixed effects.

for specification.

Table 4 reports the average marginal effects after estimating (17). Columns (1)-(2) shows the results where Y refers to *impossible*. As column (1) reports, one standard-deviation (0.15) lower of trust level of the economy is associated with 6.02 (=40.1×0.15)-points higher possibilities in average for the individual to be impossible to gain emergency funds from any sources. With controls, the effect reduces to 3.50 yet still significant.[20] Regarding the huge variation of trust across the world, in economies with the lowest level of trust (0.04) in our sample, individuals have a 17.01%- higher probability of being unable to receive any emergency funds compared to those in economies with the highest trust (0.77). It roughly corresponds to a shortfall of 17% of the total population who are rejected by FI due to the low-trust environment. If the country's trust level had been high, they should have at least had access to emergency funds from FI. In addition, the effects of other individual controls align with practical experience, such as higher-income and higher-educated individuals being more likely to gain emergency funds.

Furthermore, column (4) shows that, a one-standard-deviation *lower* in economy-level trust is associated with a 3.03 percentage-point increase in the average probability of individuals obtaining emergency funds from informal channels. In contrast, column (6) reveals that a one-standard-deviation *higher* in trust is associated with a 4.16 percentage-point increase in the average probability of gaining emergency funds from FI.

These findings demonstrate the significant role of trust in individuals' access to emergency funds. Low trust levels force individuals suffering from excess difficulties in obtaining emergency funds from FI, while higher trust levels are linked to increased probabilities of accessing funds, especially from formal FI.

A multinomial probit specification. The probit approach brings intuitive interpretations, especially in qualitative terms, while contains some potential weaknesses — it estimates the latent variables separately for each choice, yet they are taken into account together by the individuals, and even correlated. Alternatively, we estimate the multinomial probit model (MNP) on the raw categorical dependent to overcome such challenges (e.g., D'Acunto et al., 2019).[21]

[20] Note that the sample size becomes smaller after introducing controls. Therefore, the results of columns (1) and (2) are not directly comparable.

[21] Another technical reason is that attributing economy-level measures such as $Trust_k$ mechanically induces correlation of residuals within the economy, which is also overcome by MNP. Also, as D'Acunto et al. (2019) points out, the results are qualitatively similar with the specification of directly estimating MNP on the raw categorical dependent.

According to Table 2, there $p = 6$ options overall. Taking *working* as the benchmark,[22] and then define the $(p-1)$ -dimensional latent variable $U_{ikt} = (U_{ikt}^1, \cdots, U_{ikt}^{p-1})'$ and the response variable Y_{ikt} for individual i interviewed in wave t from economy k, that satisfy

$$\begin{cases} U_{ikt} = \beta \times Trust_k + X'_{ikt} \times \gamma + K'_{kt} \times \delta + \eta_t + \epsilon_{ikt}, \quad \epsilon_{ikt} \sim \mathcal{N}(0, \Sigma); \\ Y_{ikt} = j \times \mathbb{I}\left\{ \max_{s \in \{1,\cdots,p-1\}} (U_{ikt}^s) = U_{ikt}^j, U_{ikt}^j > 0 \right\}, \end{cases} \tag{18}$$

where β is a $(p-1) \times 1$ vector of coefficients of $Trust$ capturing the relationship between the trust variable and the different options. Σ is a $(p-1)\times(p-1)$ positive definite covariance matrix. X_{ikt} includes the following individual-level controls: gender, age, income level, education level, and the personal account ownership. K_{kt} are economy-level controls, including log GDP per capita, financial infrastructures, geographical/human factors, historical characteristics and the affiliated regions. η_t is the wave fixed effect. $\mathbb{I}$ denotes the indicator function. Y_{ikt} is the individual's response: one will choose option j that corresponds to the maximum positive (better than the benchmark) U_{ikt}^s.

The estimated coefficients and covariance matrix is reported in Table IA9.[23] The more intuitive interpretation is to present the predicted probabilities (PP) for each option with other conditions fixed (detailed in the figure notes), as Figure 7 shows. The figure visualizes our main implication: in low-trust economies, people are more likely to be impossible to raise any emergency funds, have to seek financial help from their close networks, but less likely to access financial activities by institutions. This generates a micro foundation of the switch from institutions to family or friends. In addition, the probabilities associated with other sources of emergency funds, such as paid working and selling assets, show little influence by trust levels.

Recall the context to the questions, the probabilities for *impossible* strip the inclusion effect from the mixing with adoption effect (at least partially): even without accounting for the preferences between FI and informal channels, the impossibility confirms the rejection by FI. The negative-sloped black curve in Figure 7 indicates that in low-trust economies, FI performs a

[22] The selection of the benchmark option is based on the following concerns. The latent variable for the benchmark will not be defined, thus it will not have coefficient estimations technically. Since we are interested in *impossible*, *family of friends*, and *financial institutions*, we do not choose them to be the benchmark. In addition, the other two choices are rarely selected according to the summary statistics. The selection of benchmark will influence the estimation and interpretation of coefficients, since they are relative to the benchmark. However, we interpret the results by calculating predicted probabilities, which are not affected by the selection of benchmark.

[23] Though it is inconvenient to interpret the coefficients directly, we still observe consistent qualitative results, i.e., *Trust* has negative coefficients w.r.t. *impossible* and *family or friends*, indicating roughly negative relationship with the corresponding probabilities, while the coefficient of *financial institutions* is positive.

narrower inclusion. In online appendix, we provide predicted probabilities in richer scenarios for comparison. Interestingly, people with higher income and education level are less likely to fall into the "impossible" situation, even they are in low-trust economies. On the contrary, low-income and less-educated people are treated extremely differently at low and high-trust economies. In high-trust economies, they are almost certainly have access to emergency funds. While in low-trust economies, the probabilities of being impossible reach 20% (and even 40% in South Asia). This observation brings strong support for the inclusion effect: observing the collective low-trust reputation, FI narrows down the service scope, where low-income and low-education groups are the first to be squeezed out, since they are originally near the edge of the serving radius.

5.2.2 Lower Trust and Less Adoption

The evidence for the adoption channel is drown from the questions in FINDEX regarding the reasons why respondents do not have an account. One of the options is due to the lack of trust in banks, which directly indicates individuals' refusing adoption, regardless whether other reasons are also selected.[24] We continue to use a general probit specification in the same form as (17) with differences including: (i) the sample set is of all individuals without personal accounts; (ii) the dependent Y_{ikt} is a dummy which equals 1 when individual i of wave t from economy k reports that the reasons for not having an account include distrust in banks. Individual and economy-level controls are the same as tests in Table 4.

Table 5 presents the average marginal effects the probit models estimate. Without additional controls as column (1) shows, one standard-deviation decrease in the economy's trust level is associated with a 2.93-point increase in the average probability of individuals without a personal account reporting distrust (in banks) as one of the causes. This percentage value even increases with controls and stabilizes around 4% of the population without accounts. Recall the summary statistics, there are only 18% of the people without accounts chose distrust as one of the reasons, suggesting the fraction associated with general trust is relatively large.

[24]The raw question allows multiple choices. We define the dependent dummy "no account due to distrust of banks" here equals 1 if and only if "distrust" is one of the selected reasons. In addition, there is no further explanations about the precise definition of "trust" in the questionnaire description. Therefore, respondents may select the option due to the lack of trust in the bank's ability to provide fair service or the bank's financial stability. Though distinguishing them is beyond our scope, we only need distrust as a summarized cause.

6 Trust and Regulation

This section focuses on empirical evidence related to regulation tightness. Our model rationalizes the heterogeneous effects of tight regulation among economies with different trust levels. In particular, under specific parameter spaces, the tightening regulation could have opposite effects: when economies fall into the low-trust equilibrium, tighter regulation of financial institutions foster economic growth. Conversely, high-trust economies benefit from looser rules that facilitate efficiency.

Unconditional divergence of regulation tightness. We focus on three close-related indices based on BRSS as mentioned in Section 4, namely *overall restrictions on bank activities* (ACT), *bank capital regulations* (CAP), and *entry into banking requirements* (ENT), where larger values capture tighter regulations in specific aspects. Table 6 presents the summary statistics and comparisons among waves I, IV and V (conducted in 1999, 2011 and 2021, respectively) in light of Barth et al. (2013). Notably, the normalized standard deviations and quantile statistics on dispersion provide evidence for persistent global divergence in these regulatory indices.[25] We divide the sample into two subgroups based on whether the trust value is greater than the global median. Within each group, the regulation tightness reveals no significant evidence of convergence.

The overall divergence leaves potential for different regulation preferences: suppose there exists a global optimum / equilibrium, then policymakers will tend to move closer, even though this may take long transition periods. However, over the twenty-year duration, this trend seems absent. That is, there could be some forces that lead to different optimum / equilibrium for economies.

Low trust is associated with tight regulation. Regarding the sub-sample medians in Table 6, high-trust economies tend to adopt relatively loose overall restrictions on bank activities (ACT). On the other hand, low-trust economies show a trend of tightening bank capital

[25] This table is comparable with Table 16 of Barth et al. (2013), where summaries of 1999 and 2011 are reported. They also conclude that there are no strong convergence, particularly there is no evidence of convergence in ACT, while CAP and ENT show a minimal degree of convergence from 2000 to 2010. We confirm their findings. For example, the percentage (pct) of economies with CAP values that are 10% away from the median decreases from 84.54% to 78.35%, and for a 25% difference, the pct decreases from 15.46% to 12.37%. However, over the next ten years until 2021, these percentages become 74.23% and 22.68%, indicating that even the minimal convergence observed during the previous period did not continue. Note that our sample set is not completely the same as Barth et al. (2013), since we collect economies that have applicable data in three waves. Therefore, the statistic values could have quantitative differences.

regulations (CAP), although their initial values are relatively lower. For entry into banking requirements (ENT), most economies place emphasis on similar levels, regardless of trust levels. We further examine economy-level regressions as Table 7 shows. Columns (1)-(4) examine the relationship between trust and ACT, while columns (5)-(8) focuses on CAP. The estimated coefficients of *Trust* in columns (1) and (5) are significantly negative, indicating that lower levels of trust are associated with tighter regulations.[26] With controlling historical GDP per capita to account for the influence of economic development levels, the coefficients of *Trust* remain negative in columns (2) and (6) though falls in statistical significance. The rest columns consider that public-relevant activities may be more affected by trust in out-groups, and thus use *out-group trust* as the main independent variable. The estimated coefficients remain significantly negative, even after controlling for GDP. Interestingly, the magnitudes of the coefficients are larger in absolute terms, confirming that out-group trust has a stronger relationship with regulatory outcomes.

There is a potential doubt combining with Table 6 and 7: the former provide a preliminary understanding that low-trust economies were adopting looser CAP two decades ago, while the latter suggests low-trust economies are associated with tight CAP in general. To explore this controversy, we conduct additional regressions on each wave reported in Table IA7. In general, low trust is associated with tight ACT and CAP in each wave, with only exceptions in regressing CAP on out-group trust in the first three waves yielding non-significant positive coefficients. That is, the diversity did not exhibit a clear correlation with trust before the 2000s, while over the recent two decades, low-trust economies tightened regulation relatively more sharply. Overall, low trust is associated with tight regulation, especially the wider coverage in recent years.

Different effects of regulation tightening. Low-trust economies tend to adopt tighter rules relative to high-trust economies. However, there are still variations that cannot be explained by trust. This is not beyond expectation, as policymakers have to consider a multitude of objectives beyond solely promoting economic growth. Additional considerations may include regional requirements, partnership agreements, etc. Also, regulatory determinations are not always optimal, even when they are pursued with a clear purpose. To this end, we test the step-back corollary, i.e., the adopted policies were not necessarily in optimal/equilibrium, but the effect of regulation tightening differs in countries with different trust levels.

[26] For the regulation on bank entry (ENT), due to the lack of differentiation of index ENT, we select another alternative index: fraction of bank entry applications denied (DENY), which is more suitable for regression analysis in Barth et al. (2013). As Table IA8 shows, low trust is also associated with tight regulation on bank entry.

Figure 8 visualizes the relationship between regulation tightening and economic growth within different trust groups. X-axis, *tightening of regulation*, is the changes in regulation index over the twenty years. Y-axis is the average annual growth rate of GDP per capita. Each country generates one point.[27] As the figure shows, there is no significant correlation in general. However, when we color the points by their belonged trust groups, we note that low-trust economies (blue points) roughly lie in the first and third quadrants with a positive-sloped fit, while high-trust economies (red points) fit a negative-sloped line — regulation tightening has opposite effects on economic growth in low/trust countries.

Table 8 supports above findings through regressions. Columns (1)-(2) show the overall irrelevance between regulation and GDP growth across the world. Columns (3)-(4) indicates that the trust itself does not lead to differences in economic growth in average. Importantly, columns (5)-(8) shows that the interaction of trust and regulation result in two different paths. The dummy $I(Low - Trust)$ equals 1 if the trust level of the economy is beyond the median. As column (5) illustrates, in high-trust economies, a regulation relaxation that corresponds to one standard-deviation (0.30) lower of the index is associated with 1.06-percentage points higher in annual growth rate of GDP per capita. In contrast, for low-trust economies, the same regulation relaxation is associated with 0.49-percentage points lower in GDP growth rate.[28] The result still holds after controlling the income level. Sub-sample tests are also reported in Table IA9, which also suggests robustness.

In general, this section supports our model implications related to regulation by steps. First, the general divergence presume the potential existence of multiple equilibria and optimal regulation decisions. Second, the pooled negative relationship between trust level and tightness uncovers the different regulation preferences or tendencies that relate to trust. Finally, even the tendencies does not transit to regulation practices due to additional practical concerns, we observe heterogeneous effects of regulation tightening on economic growth between low and high-trust countries.

[27] The sample set includes all the economies with applicable trust data and the regulation data in both wave I and V of BRSS. The changes in regulation tightness is calculated as the index value of ACT in wave V minus wave I. CAP offers similar patterns and is not reported. Although this approach is with the loss of not capturing fluctuations within individual economies, it is not crucial for our main interest. Since national policies generally exhibit a certain degree of continuity, whereas sudden shifts in regulations often result from international drastic changes which always cause synchronized changes (e.g., the financial crisis in 2008). These common changes have a limited impact on the relative relationships among economies.

[28] The estimated slope for low-trust economies should be the sum of the coefficients of $\Delta_t Regulation$ and $\Delta_t Regulation \times I(Low - Trust)$. Also, as the index ranges from 3 to 12, the potential effect could be huge.

7 Conclusion

This paper provides a simple theoretical model with trust arising endogenously and self-enforced to rationalize the interconnection of trust, credit, and economic growth. The model suggests the potential co-existence of low-trust and high-trust equilibrium in the same state space: In low-trust economies, borrowers choose strategic default, drive up population-average default rates and borrowing costs, and further limit credit supply. In contrast, high trust incentivizes borrowers not to default, and the above impact process becomes positive. Our model highlights the economic mechanism behind the persistence in trust, and explains why trust levels feed through to credit growth differences and further divergence due to the co-existing equilibria.

We complement the model with two channels with micro-data of how trust facilitates financial activities through the lens of financial institutions (lenders) and individual borrowers. On the one hand, when institutions receive the low-trust signal as a collective reputation, they narrow down the financial inclusion and reject borrowing and credit-accessing applications to some extent. On the other hand, individual borrowers also want to scale down their borrowing since they believe they have to bear the excess cost of the low-trust risk in society and would not receive fair service from institutions.

Further discussions on regulation suggest heterogeneous and even opposite effects of tight policies in low- and high-trust countries. Despite the more complex real-world determinants of rules, we find incremental empirical evidence that regulation tightness benefits low-trust more than high-trust economies. The tightened regulations can help reduce the default rate and lower the borrowing costs; however, our 35-year data is insufficient to test whether stricter rules can break the distrust curse as a self-filling prophecy. Further exploration of optimal regulatory interventions to foster trust and honest behaviors opens up interesting directions for understanding the role of financial development in economic growth.

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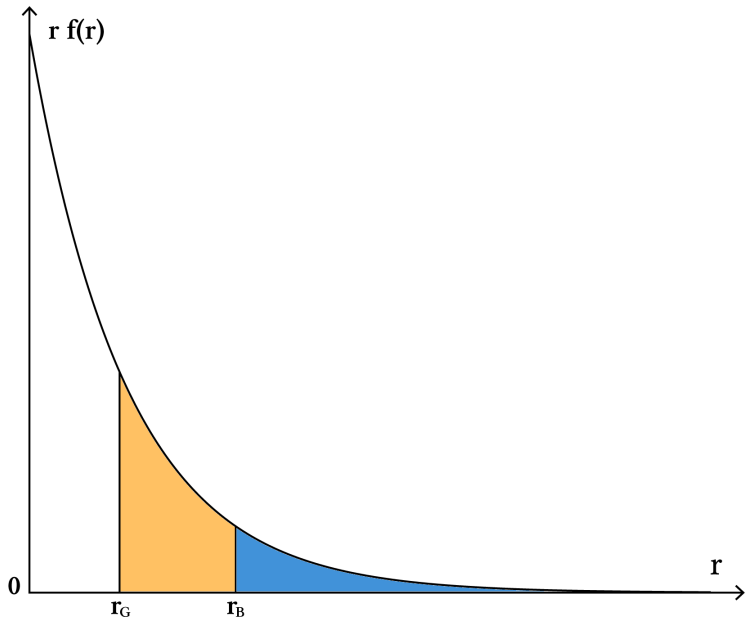
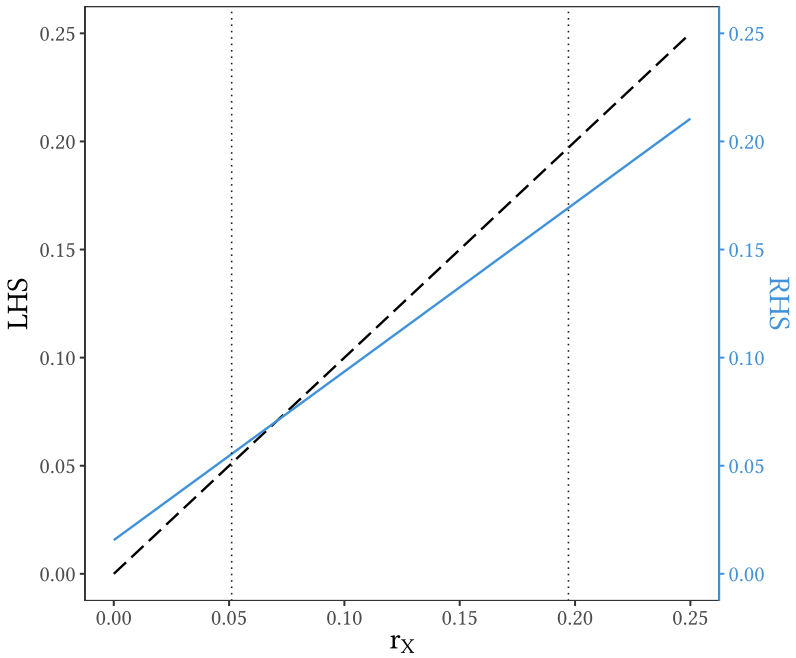
Figures and Tables

Figure 1. Comparison and Existence of High- & Low-trust Equilibrium



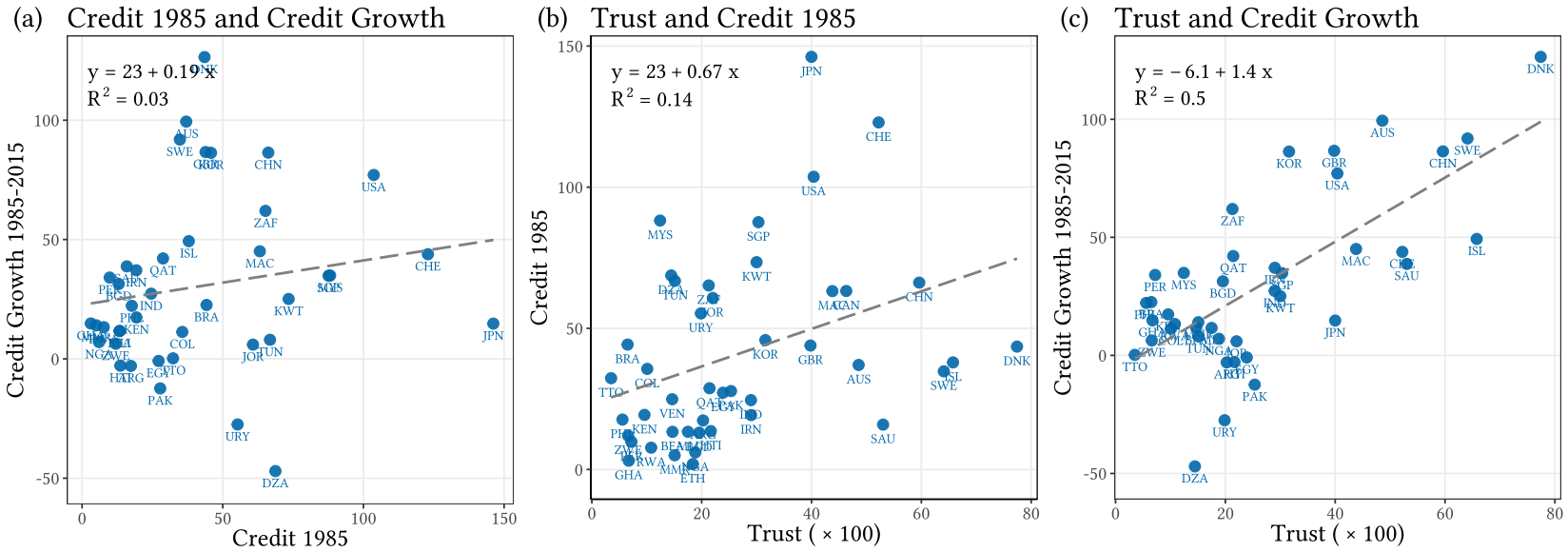
(a) Interest Rate, Credit Supply, and Economic Growth



(b) Incentive Constraints of Equilibria

Notes: Panel (a) plots the interest rate r and investment returns in both good and bad equilibrium. The subscript B indicates the bad equilibrium, where opportunistic borrowers choose to default strategically, and subscript G indicates the good equilibrium, where opportunistic borrowers choose not to default and pay interests. Panel (b) illustrates an example of the co-existence of high-trust and low-trust equilibrium. The black dashed line (LHS) refers to r_X, while the blue curve (RHS) refers to $\frac{\delta E\tau}{1-\delta E+\delta E\tau}\frac{\mathbb{E}(r|r>r_G)}{1-F(r_G)}$. Then the incentive constraints (6) and (10) require that when r_X equals r_G (r_B), the blue curve lies above (below) the black line. The corresponding dotted lines of r_G and r_B are calculated from (4) and (8). $\alpha = 0.7$, $\beta = 0.2$, $\gamma = 0.1$, $E = 0.9$, $\delta = 0.95$, $\tau = 0.6$, and $\lambda = 50$. The resulting interests $r_G = 5.11\%$ and $r_B = 19.71\%$, while the threshold in Panel (b) is $r = 7.08\%$. Having only one cutoff is entailed by the nature of $f(r)$. A more comprehensive family of distributions is discussed in Appendix.

Figure 2. Trust, Credit in 1985, and Credit Growth

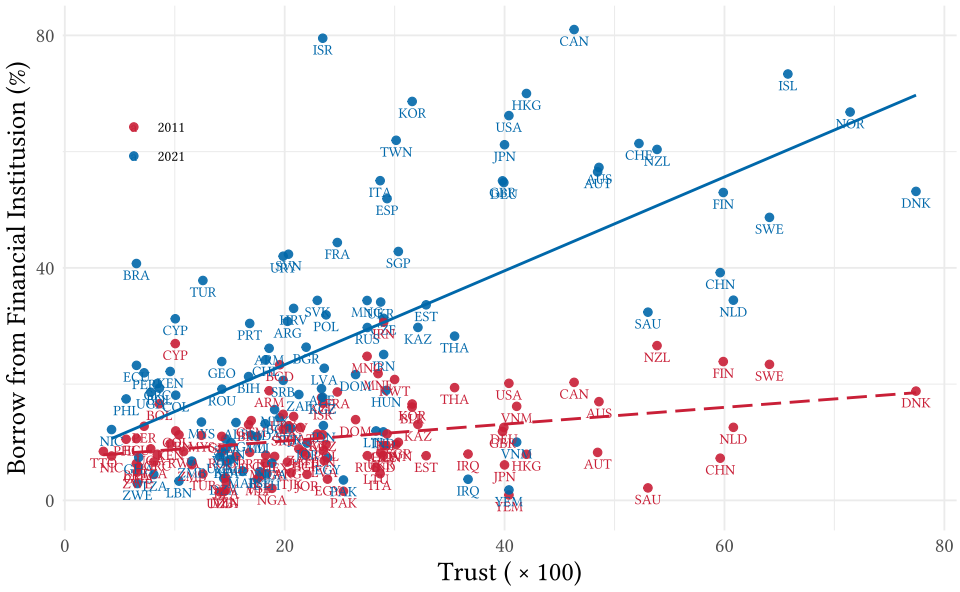


Notes: This figure plots the relationship among *trust*, domestic credit to the private sector (% of GDP) in 1985 (*credit*), and the changes in domestic credit to the private sector (% of GDP) from 1985 to 2015 (*credit growth*). In Panel (a), the x-axis represents *credit*, and the y-axis is *credit growth*. In Panel (b) and (c), the x-axes represent *trust*, and the y-axes are *credit* and *credit growth*, respectively. In every panel, each economy generates one blue scatter. The gray dashed line is the linear smooth. R^2 and $p-$value of the smooth are reported. The sample set encompasses all countries for which trust and credit data for 1985 and 2015 are available.

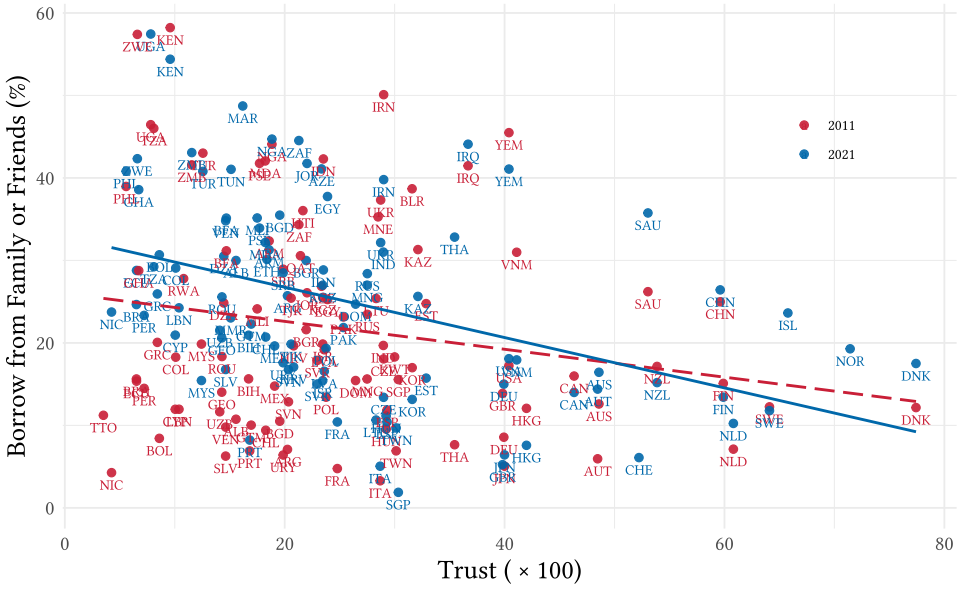
Figure 3. Persistence of Trust

Notes: This plot shows the persistence of trust level within country, i.e., lack of convergence across countries. The x-axis represents the trust level in WVS wave t_1, and the y-axis is the trust level of the next applicable wave t_2. The color and shape of scatters represent different values of $t_2 - t_1$. There are 7 waves in general, thus each country may generate multiple points. For example, suppose country i is involved in wave 2, 4, 5, and 7, it generates one blue point and two green points. The gray dashed line is the 45-degree line.

Figure 4. Trust and Borrowing Choices



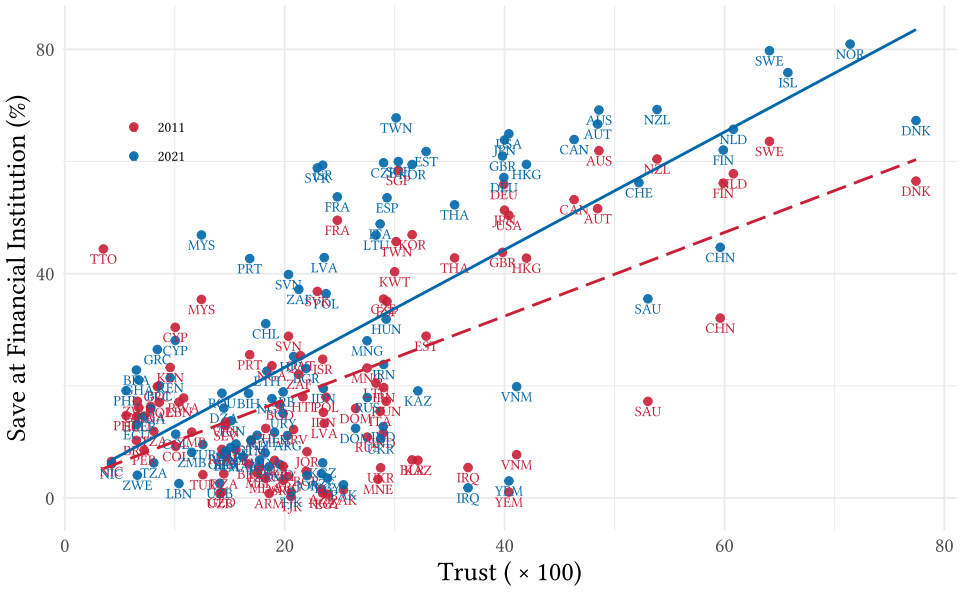
(a) Borrowing from Financial Institutions



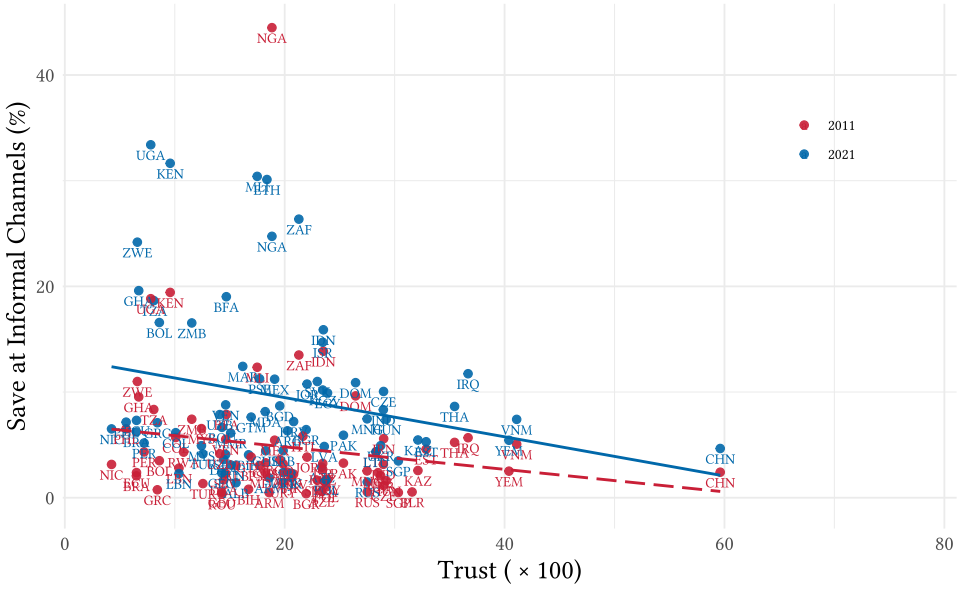
(b) Borrowing from Family or Friends

Notes: This plot depicts the relationship between trust and borrowing choices, and its longitudinal comparison between wave 2011 and 2021. Each economy yields one point for each wave. Points in red and blue refer to the observations from 2011 and 2021, respectively, and the colored lines are the corresponding linear smoothing. The 3-digit code of each economy is labeled below the point. In panel (a), the y-axis indicates the share of respondents in the economy who borrow money from financial institutions. The y-axis in panel (b) is the share of respondents that borrow from family or friends. Respondents can adopt both choices.

Figure 5. Trust and Saving Choices



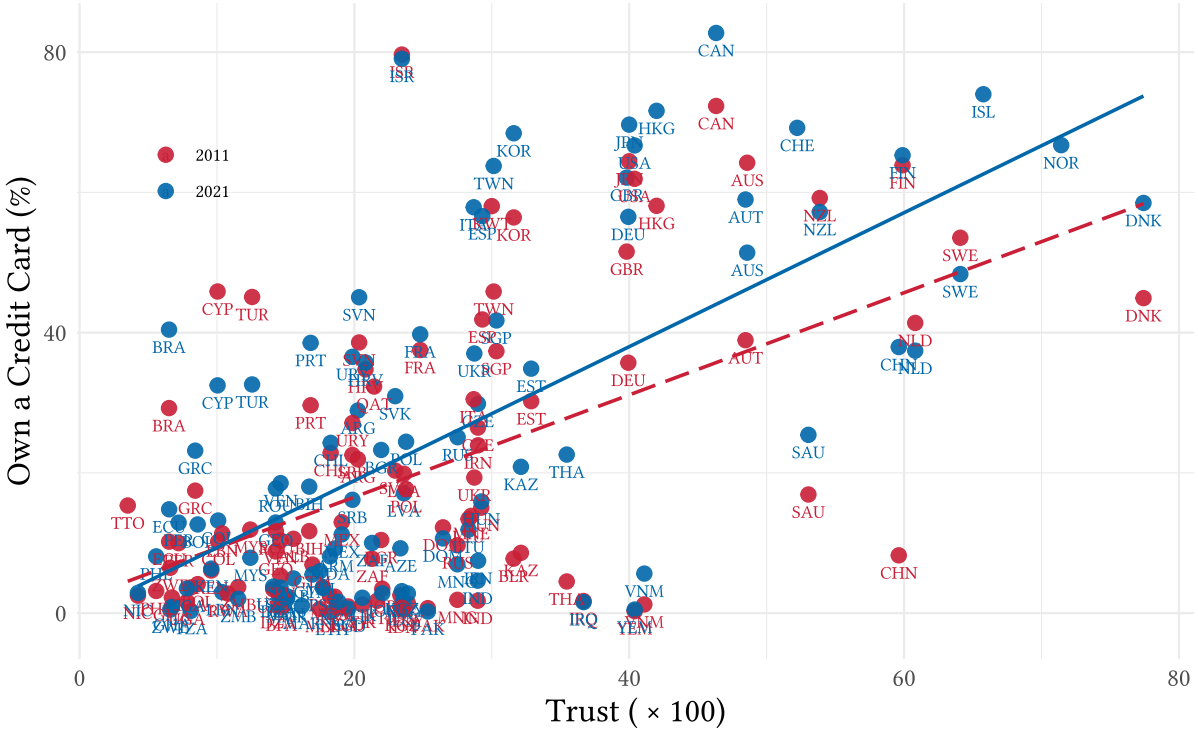
(a) Saving at Financial Institutions



(b) Saving at Informal Channels (Clubs, Saving Stores or Friends)

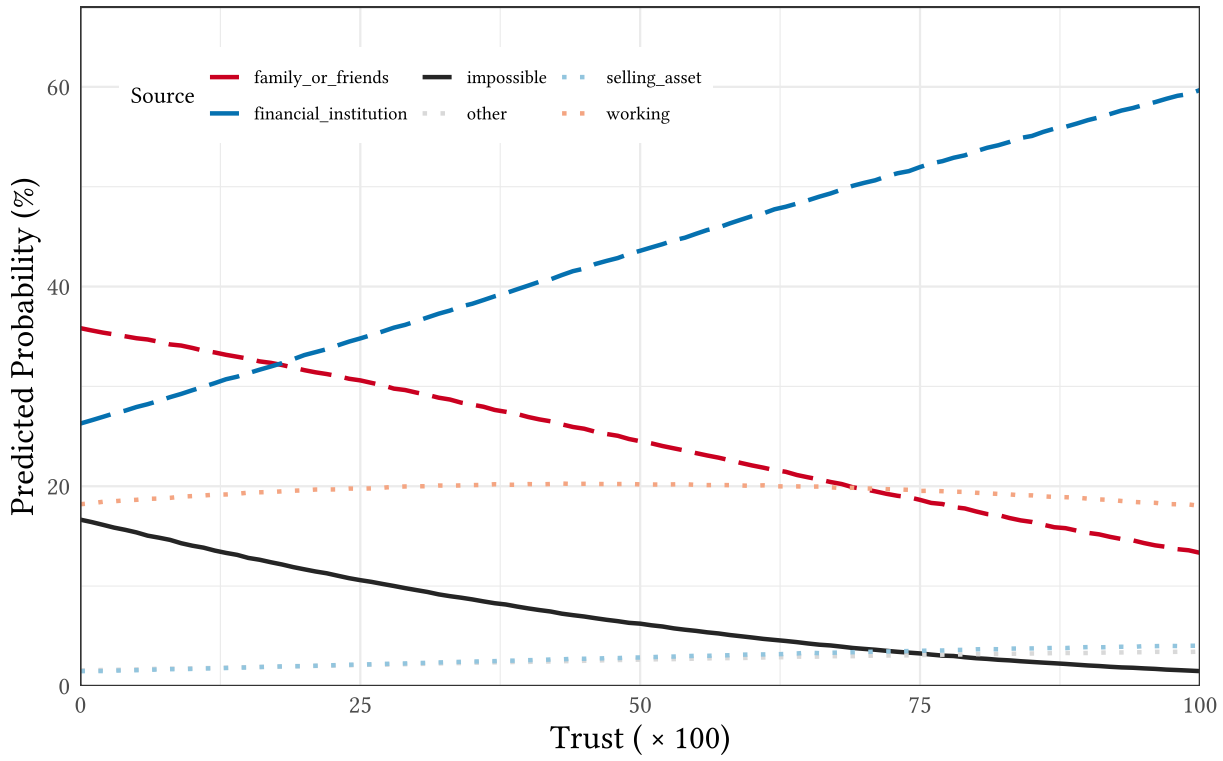
Notes: This plot depicts the relationship between trust and saving choices, and its longitudinal comparison between wave 2011 and 2021. Each economy yields one point for each wave. Points in red and blue refer to the observations from 2011 and 2021, respectively, and the colored lines are the corresponding linear smoothing. The 3-digit code of each economy is labeled below the point. In panel (a), the y-axis indicates the share of respondents in the economy who save money at financial institutions. The y-axis in panel (b) is the share of respondents that save at informal places, such as saving clubs, stores, and friends. Respondents can adopt both choices. Note that panel (b) contains missing points of certain economies, where respondents were not asked about informal saving. In the appendix, Table IA5 discusses these impact in detail.

Figure 6. Trust and Credit Card Ownership



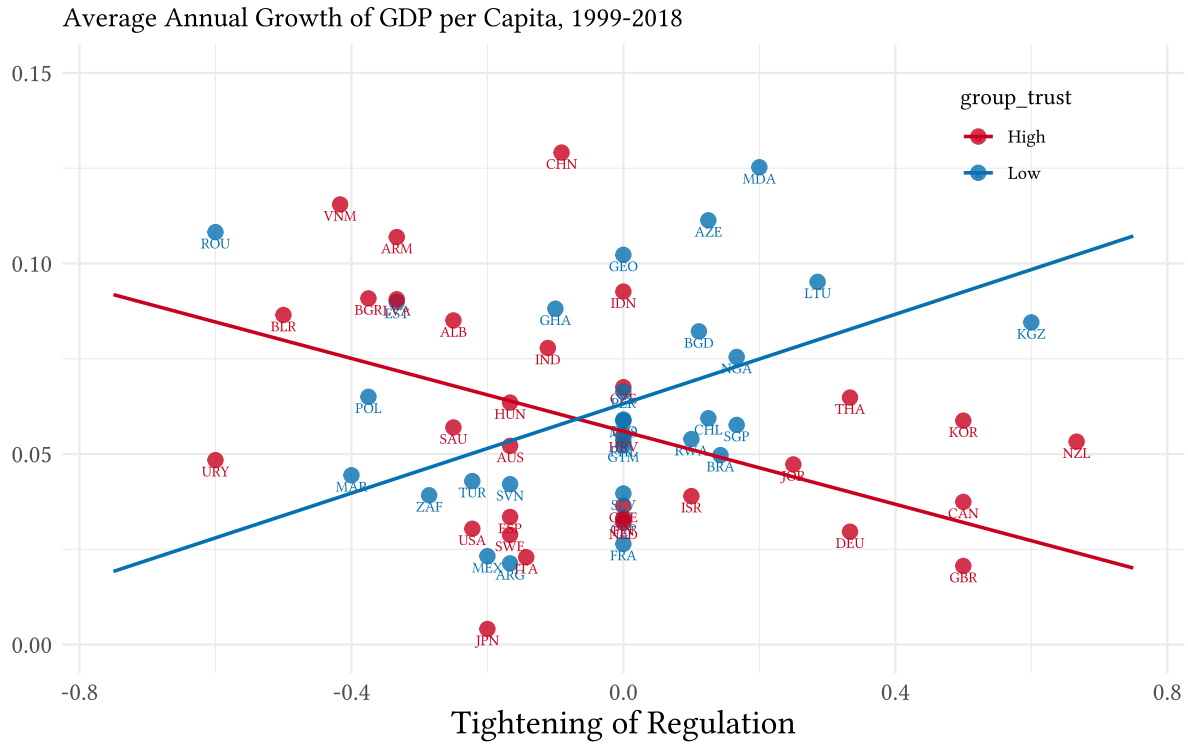
Notes: This plot depicts the relationship between trust and share of respondents who owns personal credit cards (y-axis), and its longitudinal comparison between wave 2011 and 2021. Each economy yields one point for each wave. Points in red and blue refer to the observations from 2011 and 2021, respectively, and the colored lines are the corresponding linear smoothing. The 3-digit code of each economy is labeled below the point.

Figure 7. Predicted Probability of Each Sources of Emergency Funds



Notes: This plot illustrates the relationship between trust and the predicted probabilities (PP) of various sources of emergency funds. These predictions are calculated based on the estimated main multinomial probit model. To isolate the impact of trust, all other controls are kept constant while only varying the level of trust from 0 to 1. Then for each source of emergency funds, the PP generates a curve that changes with trust. For any given trust, the summation of the six probabilities is equal to 1. All the other numerical controls are fixed at their in-sample median (with the only exception, *age*. We set it to be a frequently used 35, while the in-sample median is 43.). The categorical arguments are set to be: wave (year) from 2021, and region from South Asia. In the appendix, we provide a comparison of results in additional scenarios. The main implications remain consistent in all cases, that is, PP for "impossible" and "family or friends" decrease with trust, and "financial institutions" increase with trust.

Figure 8. Trust, Regulation Tightening, and GDP Growth



Notes: This plot illustrates the relationship between regulation tightening and GDP growth over a twenty-year period from 2000. Each economy is represented by a single data point. The x-axis represents the extent to which regulations have become tighter during this period, calculated as the change rate of the activity restriction index. Consequently, points on the right side of the plot represent economies where regulations have become tighter. The y-axis represents the annual average growth rate of GDP per capita. The sample is split into low-trust and high-trust economies, indicated by the blue and red colors, respectively. This classification is based on whether the trust level falls below or above the median. The colored lines depict the corresponding linear smoothing.

Table 1. Trust, Credit Growth, and GDP Growth

Dependent Variable:	Δ_t log(GDP per Cap.), 1985-2015			
Model:	(1)	(2)	(3)	(4)
log(GDP per Cap.), 1985	-0.102*	-0.179***	-0.233***	-0.224**
	(0.052)	(0.065)	(0.085)	(0.088)
Trust		1.120***	0.728	1.520**
		(0.419)	(0.645)	(0.618)
Credit Growth, 1985-2015			0.620*	
			(0.346)	
Observations	78	78	41	41
R^2	0.071	0.159	0.283	0.225

Notes: Country-level OLS estimates. The dependent variable is the log difference of GDP per capita between 1985 and 2015. The independents are the log GDP per capita in 1985, trust level, and the credit growth, i.e., the changes in domestic credit to the private sector from 1985 to 2015. Column (1) reports the results of β-convergence as Kremer et al. (2022) defines. Column (2) tests the prediction power of trust on economic growth. Column (3) shows that the credit growth partly explains the predictability of trust. Note that the sample set of Column (3) reduces after having credit data merged. To exclude the influence of this difference, we repeat the regression of (2) on the merged sample set as Column (4) reports. Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table 2. Summary Statistics

	Obs.	Mean	Std.Dev.	Min	25%	Median	75%	Max
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust & Economy-Level Financial Inclusion Indices								
Trust	403	0.25	0.15	0.04	0.15	0.22	0.30	0.77
Out-group Trust	379	0.30	0.08	0.16	0.24	0.29	0.34	0.50
In-group Trust	379	0.55	0.05	0.37	0.52	0.56	0.58	0.68
Δ Out/In-group Trust	379	-0.25	0.06	-0.42	-0.29	-0.24	-0.21	-0.07
Borrowing from Financial Institutions	402	0.23	0.18	0.01	0.09	0.19	0.30	0.83
Borrowing from Family or Friends	402	0.23	0.12	0.02	0.14	0.20	0.30	0.71
Borrowing Difference	402	0.00	0.26	-0.53	-0.18	-0.03	0.12	0.69
Saving at Financial Institutions	402	0.26	0.21	0.00	0.09	0.18	0.40	0.81
Saving at Club or Friends	298	0.09	0.09	0.00	0.03	0.06	0.11	0.46
Saving Difference	298	0.08	0.15	-0.27	-0.00	0.05	0.14	0.65
Credit Ownership	402	0.22	0.22	0.00	0.04	0.13	0.35	0.83
Account Ownership	402	0.62	0.30	0.03	0.36	0.64	0.92	1.00
Individual-Level Characteristics & No Account for Reasons of Distrust								
Female	388,860	0.47						
Age	387,522	42.87	17.69	15.00	28.00	40.00	56.00	99.00
Education	386,301	0.47	0.34	0.00	0.00	0.50	0.50	1.00
Income	388,844	0.56	0.35	0.00	0.25	0.50	1.00	1.00
Personal Account	388,860	0.67						
No Account Due to Distrust of Banks	129,073	0.18						
No Account Due to Distrust of Banks*	381	0.21	0.15	0.00	0.09	0.20	0.29	1.00
Sources of Emergency Funds								
Working	194,707	0.16						
Impossible	194,707	0.24						
Financial Institutions	194,707	0.32						
Family / Friends	194,707	0.23						
Selling Asset	194,707	0.02						
Other	194,707	0.02						
Working*	195	0.15	0.09	0.02	0.10	0.14	0.19	0.53
Impossible*	195	0.24	0.21	0.00	0.05	0.17	0.43	0.82
Financial Institutions*	195	0.33	0.22	0.03	0.15	0.27	0.49	0.82
Family / Friends*	195	0.23	0.14	0.04	0.12	0.20	0.33	0.63

Notes: Summary statistics for key variables from WVS and FINDEX. The economy-level data set is an (unbalanced) panel with 102 economies and 4 waves, in which each sample is an economy-wave specific observation. The individual-level data is repeated cross-sections, in which each observation is a respondent interviewed by FINDEX between 2011 and 2021. Indicators with no standard deviation reported are dummy variables. Rows with * indicate the economy-wave grouped averages of the corresponding dummies, respectively. The variable "No Account Due to Distrust of Banks" is applicable only when the respondent does not have an account. Thus, the number of the observations is smaller. Variables on sources of emergency funds are six choices separated from a categorical variable. Therefore, for each individual observation, the six dummies contain and only contain one 1 (excluding non-applicable observations). The corresponding raw question only appears in the latest two waves of FINDEX, leading to fewer samples.

Table 3. Trust and Participation in Financial Activities

Panel A: Borrowing.	Borrowing Difference					Δ_t Borrowing Difference		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	4.98***	4.96***	1.52***	0.933**	1.81***	1.39***	1.85***	0.660*
	(0.474)	(0.454)	(0.379)	(0.412)	(0.555)	(0.332)	(0.325)	(0.347)
Log GDP p.c. 2010				0.369***	0.210			0.406***
				(0.083)	(0.133)			(0.058)
Lag Borrowing Difference							-0.101***	-0.317***
							(0.036)	(0.046)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	402	402	402	398	273	294	294	291
R^2	0.210	0.248	0.658	0.675	0.699	0.049	0.224	0.353
Panel B: Saving.	Saving at FI					Δ_t Saving at FI		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	4.45***	4.44***	2.74***	2.13***	2.29***	0.333***	0.498***	0.396**
	(0.227)	(0.223)	(0.233)	(0.224)	(0.316)	(0.105)	(0.161)	(0.163)
Log GDP p.c. 2010				0.376***	0.376***			0.094***
				(0.038)	(0.069)			(0.021)
Lag Saving at FI							-0.038	-0.129***
							(0.025)	(0.031)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	402	402	402	398	273	294	294	291
R^2	0.461	0.479	0.746	0.802	0.804	0.026	0.043	0.126
Panel C: Credit Ownership.	Credit Ownership					Δ_t Credit Ownership		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	3.88***	3.87***	1.91***	1.18***	1.54***	0.226**	0.352**	0.300**
	(0.273)	(0.272)	(0.253)	(0.247)	(0.305)	(0.112)	(0.144)	(0.149)
Log GDP p.c. 2010				0.444***	0.310***			0.051***
				(0.038)	(0.061)			(0.017)
Lag Credit Ownership							-0.034	-0.093***
							(0.021)	(0.028)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	402	402	402	398	273	294	294	291
R^2	0.350	0.354	0.686	0.760	0.813	0.019	0.041	0.068

Notes: Country-level OLS estimates. The three panels share the same specifications but with different dependents. In Panel A column (1)-(5), the dependent, *Borrowing Difference*, is the population share among adults (pct.) of borrowing from financial institutions minus the population share of borrowing from family / friends. In column (6)-(8), the dependent is the change of *Borrowing Difference* comparing to the previous wave. The dependents in Panel B are pct. of saving at financial institutions and its cross-wave difference and, in Panel C, pct. of owning a credit card and its difference. The dependent variables are expressed as z-scores for comparison. The main independent is the general trust. Country-level historical GDP per capita is controlled. Lag value is used as a control when the dependent is Δ_t*Borrowing Difference*. Fixed effects include waves and regions. Historical controls include average amount of ATMs / bank branches per 1,000 km / 10,000 adults in 2010 (before the first wave), respectively. These controls are missing for some countries, resulting in a smaller sample size in column (5). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table 4. Country Trust Levels and Sources of Emergency Funds for Individuals

	Sources of Emergency Funds:					
	Impossible		Family / Friends		Financial Institutions	
	(1)	(2)	(3)	(4)	(5)	(6)
Trust	-0.401^{***}	-0.233^{***}	-0.376^{***}	-0.202^{***}	0.770^{***}	0.277^{***}
	(0.079)	(0.072)	(0.049)	(0.070)	(0.121)	(0.076)
Female		-0.027^{***}		0.021^{***}		0.004
		(0.005)		(0.005)		(0.003)
Age		0.001^{***}		-0.002^{***}		0.002^{***}
		(0.0002)		(0.0003)		(0.0003)
Income		-0.193^{***}		-0.025^{**}		0.144^{***}
		(0.008)		(0.011)		(0.007)
Education		-0.155^{***}		-0.003		0.095^{***}
		(0.011)		(0.013)		(0.011)
Personal Account		-0.080^{***}		-0.054^{***}		0.128^{***}
		(0.008)		(0.012)		(0.013)
Log GDP p.c.		-0.063		-0.036		0.050
		(0.048)		(0.042)		(0.040)
Country-level Controls		Yes		Yes		Yes
Historical Controls		Yes		Yes		Yes
Wave FE		Yes		Yes		Yes
Observations	194,707	126,729	194,707	126,729	194,707	126,729
Pseudo R^2	0.018	0.254	0.017	0.055	0.064	0.182

Notes: Individual-level probit model. Estimated average marginal effects are reported after estimating the probit specification:

$$Pr(Y_{ikt}|X_{ikt}, K_{kt}) = \Phi(\alpha + \beta \times Trust_k + X'_{ikt} \times \gamma + K'_{kt} \times \delta + \eta_t + \epsilon_{ikt}).$$

The sample set is a repeated cross-sectional data, in which each observation is an adult interviewed by FINDEX between 2011 and 2021. The dependent, Y_{ikt}, is a dummy which equals to 1 if the adult reports that her most likely source of emergency funds is Y. In column (1)-(2), Y refers to "impossible", i.e., it is impossible for the individual to receive emergency funds. In column (3)-(4), Y refers to borrowing from family or friends. And In column (5)-(6), Y refers to borrowing or withdrawing from financial institutions. The main independent of interest is the country trust level. The individual control, X_{ikt}, includes: gender dummy, age, income level within the country (five levels from lowest to highest, normalized to 0 to 1), education level (three levels from lowest to highest, normalized to 0 to 1), and personal account dummy (equals 1 if the individual has an account). Country-level control, K_{kt}, includes: log GDP per capita, and average amount in 2010 of ATMs / bank branches per 1,000 km / 10,000 adults in the year of each wave, and historical values of these listed variables in 2010. Wave fixed-effect is estimated as dummies. Standard errors of the marginal effects are clustered at the country level and reported in parentheses. While there are discussions on whether the standard errors of the probit model should be clustered from a model identification perspective, we report the results of clustering, which increases the standard errors technically. The main results are not affected. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table 5. Country Trust Levels and Individual Non-adoption of Financial Institutions

Dependent variable:	No Account due to Distrust of Banks					
	(1)	(2)	(3)	(4)	(5)	(6)
Trust	−0.195*	−0.299***	−0.269***	−0.266***	−0.269**	−0.265**
	(0.106)	(0.105)	(0.099)	(0.100)	(0.133)	(0.132)
Account Ownership		0.002	−0.049	−0.055	−0.044	−0.043
		(0.071)	(0.076)	(0.077)	(0.094)	(0.095)
Log GDP p.c.		0.041***	0.050***	0.044***	0.054	0.048
		(0.014)	(0.015)	(0.015)	(0.046)	(0.046)
Female				0.012***		0.012**
				(0.004)		(0.005)
Age				0.001***		0.001***
				(0.0003)		(0.0003)
Income				0.006		0.012*
				(0.005)		(0.006)
Education				0.059***		0.045**
				(0.018)		(0.019)
Country-level Controls					Yes	Yes
Historical Controls					Yes	Yes
Wave FE		Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.003	0.014	0.020	0.026	0.026	0.030
Observations	129,073	128,425	128,425	127,193	87,886	86,829

Notes: Individual-level probit model. Estimated average marginal effects are reported after estimating the probit specification:

$$Pr(Y_{ikt}|X_{ikt}, K_{kt}) = \Phi(\alpha + \beta \times Trust_k + X'_{ikt} \times \gamma + K'_{kt} \times \delta + \eta_t + \epsilon_{ikt}).$$

The sample set is a repeated cross-sectional data, in which each observation is an adult who does not own an account interviewed by FINDEX between 2011 and 2021. The dependent, Y_{ikt}, is a dummy which equals to 1 if the adult reports that the reason for not having an account is distrust of banks. The main independent of interest is the country trust level. The individual control, X_{ikt}, includes: gender dummy, age, income level within the country (five levels from lowest to highest, normalized to 0 to 1), and education level (three levels from lowest to highest, normalized to 0 to 1). Country-level control, K_{kt}, includes: population share of owning an account, log GDP per capita, average amount of ATMs / bank branches per 1,000 km / 10,000 adults in the year of each wave, and historical values of these listed variables in 2010. Wave fixed-effect is estimated as dummies. Φ is the standard normal cdf. Standard errors of the marginal effects are clustered at the country level and reported in parentheses. While there are discussions on whether the standard errors of the probit model should be clustered from a model identification perspective, we report the results of clustering, which increase the standard errors technically. The main results are not affected. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table 6. Divergence in Regulation over Time

Indices	Group	Number of Economies	Range		Median			Normalized Std.Dev.			Pct. of Economies with Values Different from the Median by								
											10%			25%			50%		
			Min	Max	(I)	(IV)	(V)	(I)	(IV)	(V)	(I)	(IV)	(V)	(I)	(IV)	(V)	(I)	(IV)	(V)
Overall Restrictions on Bank Activities	All	90	3	12	7.00	7.00	7.00	0.239	0.221	0.239	82.22	84.44	87.78	30.00	22.22	23.33	1.11	2.22	2.22
	High Trust	30	3	11	6.00	6.00	5.50	0.276	0.266	0.273	73.33	83.33	60.00	26.67	26.67	30.00	3.33	3.33	13.33
	Low Trust	33	3	12	7.50	7.00	7.00	0.229	0.204	0.241	75.76	81.82	87.88	33.33	18.18	21.21	0.00	3.03	3.03
Bank Capital Regulations	All	97	2	10	6.00	7.00	7.14	0.221	0.213	0.231	84.54	78.35	74.23	15.46	12.37	22.68	0.00	1.03	0.00
	High Trust	31	2	10	6.00	8.00	8.00	0.202	0.248	0.182	74.19	70.97	70.97	12.90	16.13	12.90	0.00	6.45	0.00
	Low Trust	33	2	10	5.00	7.00	8.00	0.240	0.223	0.216	66.67	75.76	84.85	27.27	15.15	12.12	0.00	0.00	6.06
Entry into Banking Requirements	All	119	0	8	8.00	8.00	8.00	0.125	0.061	0.144	30.25	17.65	20.17	3.36	0.84	3.36	1.68	0.00	1.68
	High Trust	36	0	8	8.00	8.00	8.00	0.168	0.051	0.226	41.67	19.44	19.44	8.33	0.00	8.33	2.78	0.00	5.56
	Low Trust	40	3	8	8.00	8.00	8.00	0.192	0.119	0.167	30.00	20.00	20.00	10.00	2.50	10.00	2.50	2.50	2.50

Note: This table reports the summary statistics of three indices that are related to regulation tightness on banks and other financial institutions, targeting on activities restrictions, capital regulations, and entry requirements, respectively. The generation of the indices are based on three waves of the World Bank BRS survey, following the calculation approach of Barth et al. (2013). For each index, the total sample is the economies for which all three waves are applicable. The high-trust group is the sub-sample with country trust levels above the median, whereas the low-trust group is the lower half. Due to the lack of trust data in some countries, the aggregate number of economies of high and low-group is lower than the totals. For each index, higher values indicate tighter regulation. The range of values and the median of each indicator in each wave for each group are shown. Then the indices are normalized to 0 to 1. To observe the separation among countries for each indicator, we report the standard deviation, as well as the proportion of countries that are separated by a certain distance from the median. These normalized metrics can also be used for comparisons between waves for observing convergence / divergence trends in regulations over time. Columns (I), (IV), and (V) indicate corresponding statistics of the first, fourth, and fifth waves of the World Bank BRS surveys. These three surveys were completed in 1999, 2011, and 2021, respectively.

Table 7. Trust and Regulation Tightness

Dependent Variables:	Activity Restriction				Capital Regulation			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	-3.46***	-0.100			-1.14**	-1.22*		
	(0.598)	(0.644)			(0.578)	(0.730)		
Out-group Trust			-11.4***	-5.09***			-2.38*	-2.69*
			(1.22)	(1.64)			(1.27)	(1.60)
Log GDP p.c. 1995		-0.603***		-0.488***		0.101		0.080
		(0.122)		(0.120)		(0.114)		(0.114)
Wave FE		Yes		Yes		Yes		Yes
Region FE		Yes		Yes		Yes		Yes
Observations	423	423	400	400	420	420	397	397
R^2	0.071	0.265	0.183	0.310	0.009	0.217	0.010	0.199

Notes: Country-level OLS estimates. In column (1)-(4), the dependent variable is the index of overall restrictions on bank activities. In (5)-(8), the dependent is the index of bank capital regulations. The main independents of interest are the general trust, and the trust level within the out-group (trust in people met in the first time, other region, and foreigners). Country-level historical GDP per capita is controlled. Fixed effects include the survey wave (five in total, 1999, 2002, 2006, 2011, and 2021), and the region (seven in total, divided by the World Bank). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table 8. Trust, Regulation Tightening, and GDP Growth

Dependent Variable:	Average Growth Rate of GDP p.c., 2000-2020							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Δ_t Regulation	-0.010	-0.005			-0.035**	-0.042***	-0.029**	-0.029**
	(0.013)	(0.011)			(0.015)	(0.015)	(0.012)	(0.012)
Δ_t Regulation × I(Low-Trust)					0.051*	0.059**	0.046*	0.047*
					(0.027)	(0.025)	(0.024)	(0.024)
I(Low-Trust)			0.007	-0.003		0.012*		0.001
			(0.007)	(0.008)		(0.007)		(0.007)
Income: Low		0.008*		0.009			0.005	0.004
		(0.004)		(0.007)			(0.005)	(0.007)
Income: Lower Middle		0.028***		0.029***			0.026***	0.026***
		(0.008)		(0.009)			(0.007)	(0.008)
Income: Upper Middle		0.027***		0.029***			0.027***	0.026***
		(0.008)		(0.009)			(0.008)	(0.009)
Observations	61	61	61	61	61	61	61	61
R^2	0.010	0.232	0.014	0.232	0.084	0.122	0.293	0.293

Notes: Country-level OLS estimates. The sample set includes all the economies for which the regulation data from the first and latest wave of the BRS survey, as well as the trust data from the WVS/EVS survey, are applicable. Each economy generates an observation. The dependent variable is the average growth rate of GDP per capita from 2000 to 2020. The independent variables include: (i) The change of the regulation tightness from over the twenty years, Δ_t*Regulation*, which equals to the value of the overall restrictions on bank activities index in the latest survey minus the value in the first survey; (ii) The trust group dummy, *I(Low-Trust)*, which equals to 1 if the trust level of the country is below the median. Since the GDP growth rate relates to the current GDP level, we introduce the income level (defined and divided by World Bank) dummies as controls, where the benchmark is High-income countries. It is basically equivalent to fix the income level effect. Column (1)-(4) implies the unconditional irrelevance between regulation tightening and economic growth, as well as the indifferent growth trend between the trust groups. Column (5)-(8) indicates that conditional on the trust group, the regulation tightening has significant opposite relation with the economic growth. Heteroskedasticity-robust standard-errors in parentheses. $^{***},^{**},^{*}$ indicate statistical significance at the 1%, 5% and 10% respectively.

Appendix

A. Omitted Proofs

A.1 Proof of Proposition 1

Proof. With $f(r) = \lambda e^{-\lambda r}$, we obtain

$$\frac{\int_{r_X}^{\infty} f(r) r \mathrm{d}r}{\int_{r_X}^{\infty} f(r) \mathrm{d}r} = r_X + \frac{1}{\lambda}, \quad X \in \{G, B\}.$$

Substituting into the incentive constraints, (10) and (6), and rearranging the inequalities, we derive (12), i.e.,

$$r_G \leq \frac{\delta E \tau}{\lambda(1 - \delta E)} \leq r_B.$$

Substituting the formulas of r_G and r_B, (4) and (8), we obtain (13), i.e.,

$$\frac{1}{\frac{\lambda(1-E\tau)(1-\delta E)}{\delta E \tau} + 1} \in [\gamma, \gamma + \beta].$$

□

A.2 Proof of Proposition 2

Proof. The direct comparison between (7) and (11) generates the results. □

A.3 Proof of Lemma 1

Proof. With the existence of private credit supply, each borrower will firstly compare the maximum possible payoff (either default or being good) from the financial institutions with the payoff from private lenders.[29] On the one hand, the "good" borrowers compare the received two interest rates, $r_P = \bar{r}/q$ and $\tilde{r}_X$. If and only if $q \geq \bar{r}/\tilde{r}_X$, the borrower prefers informal channels. Let $q_X^* = q^*(\tilde{r}_X) = \bar{r}/\tilde{r}_X$. Then if and only if $q \geq q_X^*$, the borrower prefers informal channels.

For the high-trust case, the new high trust equilibrium yields $(1 - q_G^*)(\alpha + \beta)$ borrowers turn to informal channels. On the other hand, default borrowers would also turn to private market when the private interest is good enough, i.e.,

$$\int_{\tilde{r}_G}^{\infty} f(r) r \mathrm{d}r \leq \int_{r_P}^{\infty} f(r)(r - r_P)\mathrm{d}r, \quad \Leftrightarrow q \geq q^{**}(\tilde{r}_G) \equiv \frac{\bar{r}}{\tilde{r}_G - \frac{1}{\lambda}\ln(\lambda \tilde{r}_G + 1)}.$$

That is, $(1 - q_G^{**})\gamma$ fraudulent also turn to informal channels.

[29] Recall that we assume borrowers do not strategically default in the private credit market as it brings terrible real-life influence.

Consider the formal credit market. Denote q_G^{**}/q_G^* as ρ_G, which is shown to be larger than one. Then the lender (financial institution) faces a crowd with $\tilde{\alpha}$ honest, $\tilde{\beta}$ opportunistic, and $\tilde{\gamma}$ borrowers, where

$$\tilde{\alpha} = \frac{q_G^*\alpha}{q_G^*\alpha + q_G^*\beta + q_G^{**}\gamma} = \frac{\alpha}{1+(\rho_G-1)\gamma}, \quad \tilde{\beta} = \frac{\beta}{1+(\rho_G-1)\gamma}, \quad \tilde{\gamma} = \frac{\rho_G\gamma}{1+(\rho_G-1)\gamma}.$$

This implies that the actual share of fraudulent borrowers increases. Similarly, we solve $\tilde{r}_G$ by ensuring the interest return covers the default loss,

$$\tilde{r}_G = \frac{\tilde{\gamma}}{1-\tilde{\gamma}}(1-E\tau) = \frac{\rho_G\gamma}{\alpha+\beta}(1-E\tau) = \rho_G r_G > r_G.$$

Substituting $\rho_G = q^{**}(\tilde{r}_G)/q^*(\tilde{r}_G)$, we obtain that $\tilde{r}_G$ satisfies

$$r_G = \frac{\gamma}{1-\gamma}(1-E\tau) = \tilde{r}_G - \frac{1}{\lambda}\ln(\lambda\tilde{r}_G+1).$$

Note that the R.H.S. monotonically increases in $\tilde{r}_G$, the equilibrium interest rate is unique under applicable parameter spaces. In particular, $\tilde{r}_G$ is independent of $\bar{r}$. Therefore, ρ_G and $\tilde{r}_G$ are unique.

Similarly, in the low-trust case,

$$\tilde{\alpha} = \frac{\alpha}{1+(\rho_B-1)(\beta+\gamma)}, \quad \tilde{\beta} = \frac{\rho_B\beta}{1+(\rho_B-1)(\beta+\gamma)}, \quad \tilde{\gamma} = \frac{\rho_B\gamma}{1+(\rho_B-1)(\beta+\gamma)},$$

where $\rho_B = \frac{\tilde{r}_B}{\tilde{r}_B - \frac{1}{\lambda}\ln(\lambda\tilde{r}_B+1)}$, and $r_B = \tilde{r}_B - \frac{1}{\lambda}\ln(\lambda\tilde{r}_B+1)$. □

A.4 Proof of Proposition 3

Proof. First consider the high-trust equilibrium.

$$Q_G = (1-q_G^*)(\alpha+\beta) + (1-q_G^{**})\gamma$$

and the representative private lender's problem reads

$$\max_{\bar{r}} \quad (\bar{r}-\sigma)Q_G = \max_{\bar{r}} \quad (\bar{r}-\sigma)\left[1-\left(\frac{\alpha+\beta}{\tilde{r}_G} + \frac{\gamma}{\tilde{r}_G - \frac{1}{\lambda}\ln(\lambda\tilde{r}_G+1)}\right)\bar{r}\right]$$
$$\equiv \max_{\bar{r}} \quad (\bar{r}-\sigma)(1-k_G\bar{r}) \le k_G\left(\frac{\bar{r}-\sigma+1/k_G-\bar{r}}{2}\right)^2 = \frac{(1-k_G\sigma)^2}{2k},$$

where k_G is independent with $\bar{r}$ and the second line comes from the mean-value inequality. The maximum is obtained when $\bar{r} = \frac{1+\sigma k_G}{2k_G}$, and

$$Q_G = \frac{1-\sigma k_G}{2}.$$

Similarly, we solve $Q_B = \frac{1-\sigma k_B}{2}$, where

$$k_B = \frac{\alpha}{\tilde{r}_B} + \frac{\beta+\gamma}{\tilde{r}_B - \frac{1}{\lambda}\ln(\lambda\tilde{r}_B+1)}.$$

Define

$$r(x) = \frac{x+\gamma}{1-x-\gamma}(1-E\tau), \quad \tilde{r}(x) - \frac{1}{\lambda}\ln(\lambda\tilde{r}(x)+1) = r(x),$$
$$k(x) = \frac{1-x-\gamma}{\tilde{r}(x)} + \frac{x+\gamma}{\tilde{r}(x) - \frac{1}{\lambda}\ln(\lambda\tilde{r}(x)+1)} = \frac{1-x-\gamma}{\tilde{r}(x)} + \frac{x+\gamma}{r(x)} = (1-x-\gamma)\left(\frac{1}{\tilde{r}(x)} + \frac{1}{1-E\tau}\right),$$

then $k_B = k(\beta)$, $k_G = k(0)$. Note that $Q_B \geq Q_G \Leftrightarrow k_G \geq k_B$, then the sufficient condition is to show

$$k'(x) < 0, \quad \forall x \in [0, 1-\gamma).$$

Take the first-order derivative w.r.t. x on both sides of $r(x) = \tilde{r}(x) - \frac{1}{\lambda}\ln(\lambda\tilde{r}(x)+1)$, we obtain

$$0 < r'(x) = \left(1 - \frac{1}{\lambda\tilde{r}(x)+1}\right)\tilde{r}'(x) \quad \Rightarrow \quad \tilde{r}'(x) > 0.$$

Then

$$k'(x) = -(1-x-\gamma)\frac{1}{\tilde{r}(x)^2}\tilde{r}'(x) - \left(\frac{1}{\tilde{r}(x)} + \frac{1}{1-E\tau}\right) < 0.$$

Therefore, $Q_B > Q_G$.

□

A.5 Proof of Proposition 4

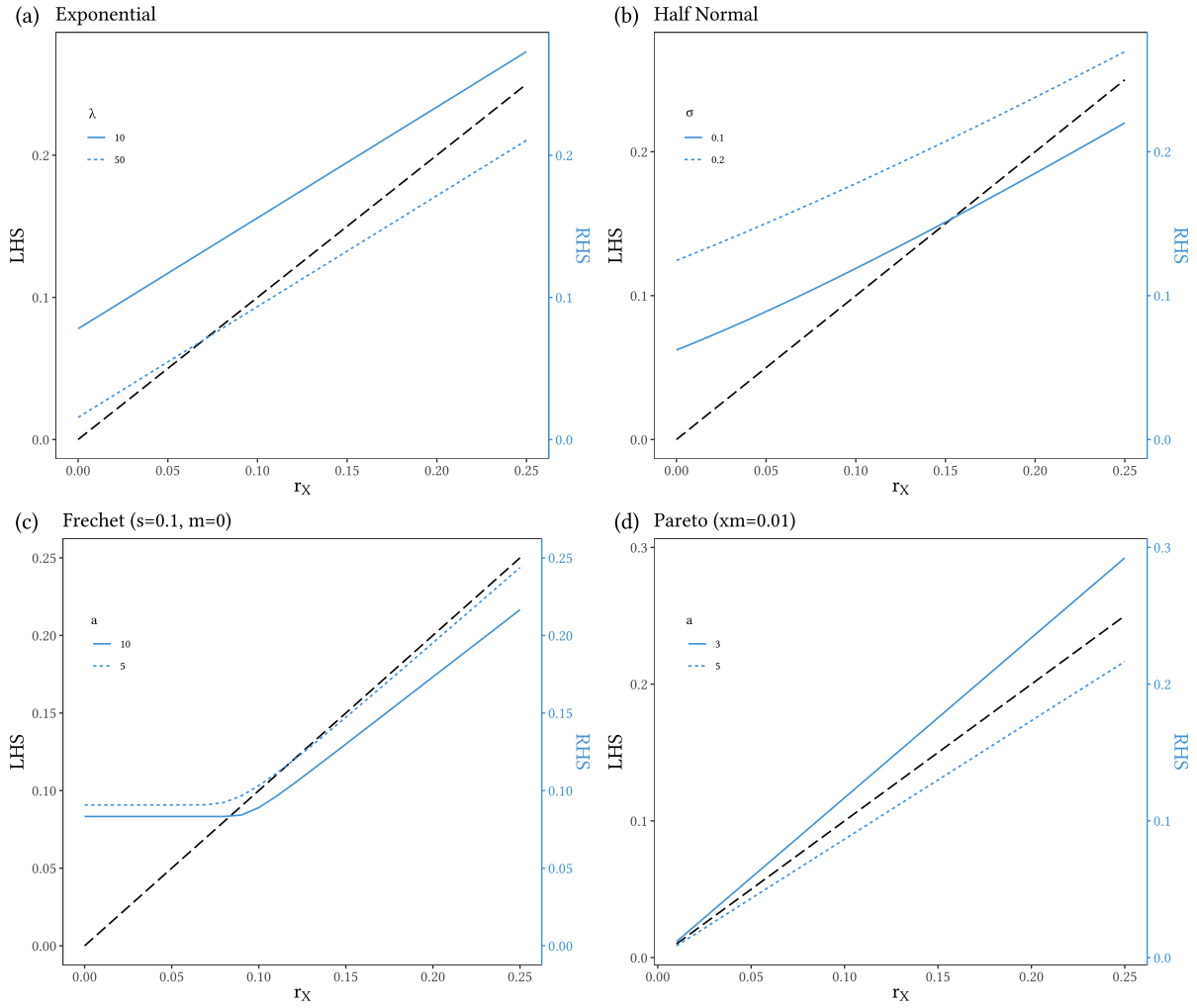
Proof. Rearranging (12) and substituting (8) generate the result. □

B. Comparative Statics: Distribution of Return Rates

In our main analysis, we use exponential distribution for simpler analytical solutions. Essentially, a large family of distributions has the same phenomenon. We examine the following commonly used distributions as Figure B1 shows. Among these distributions, half-normal and Fréchet distributions (and a series of similar distributions that are not reported) show similar probabilities to satisfy the necessary conditions for the existence of multiple equilibria. The Pareto distribution, however, acts as a threshold, as its corresponding "RHS" is also a linear

line from the origin. Thus, except the case when $LHS = RHS$, the parameters of the Pareto distribution will directly determine the unique existence of high-trust or low-trust equilibrium, as panel (d) shows.

Figure B1. Incentive Constraints of Equilibria: Different Distributions



Notes: This plot visualizes the same examination as Figure 1 (b) with different distribution $f(r)$. In each panel, the black dashed line (LHS) refers to r_X, while the blue curves (RHS) refer to $\frac{\delta E\tau}{1-\delta E+\delta E\tau}\frac{\mathbb{E}(r|r>r_G)}{1-F(r_G)}$. Then the incentive constraint of high (low) -trust equilibrium requires that when r_X equals r_G (r_B), the blue curves lie above (below) the black line. Panel (a) uses exponential distributions, i.e., $f(r) = \lambda e^{-\lambda r}$; panel (b) uses half-normal distributions, i.e., $f(r) = \frac{\sqrt{2/\pi}}{\sigma}e^{-r^2/(2\sigma^2)}$; panel (c) uses Fréchet distributions with $m = 0$, i.e., $f(r) = \frac{a}{s}(r/s)^{-1-a}e^{-(r/s)^{-a}}$; panel (d) uses Pareto distributions with $x_m = 0.01$, $r \geq x_m$, i.e., $f(r) = \frac{ax_m^a}{r^{a+1}}$.

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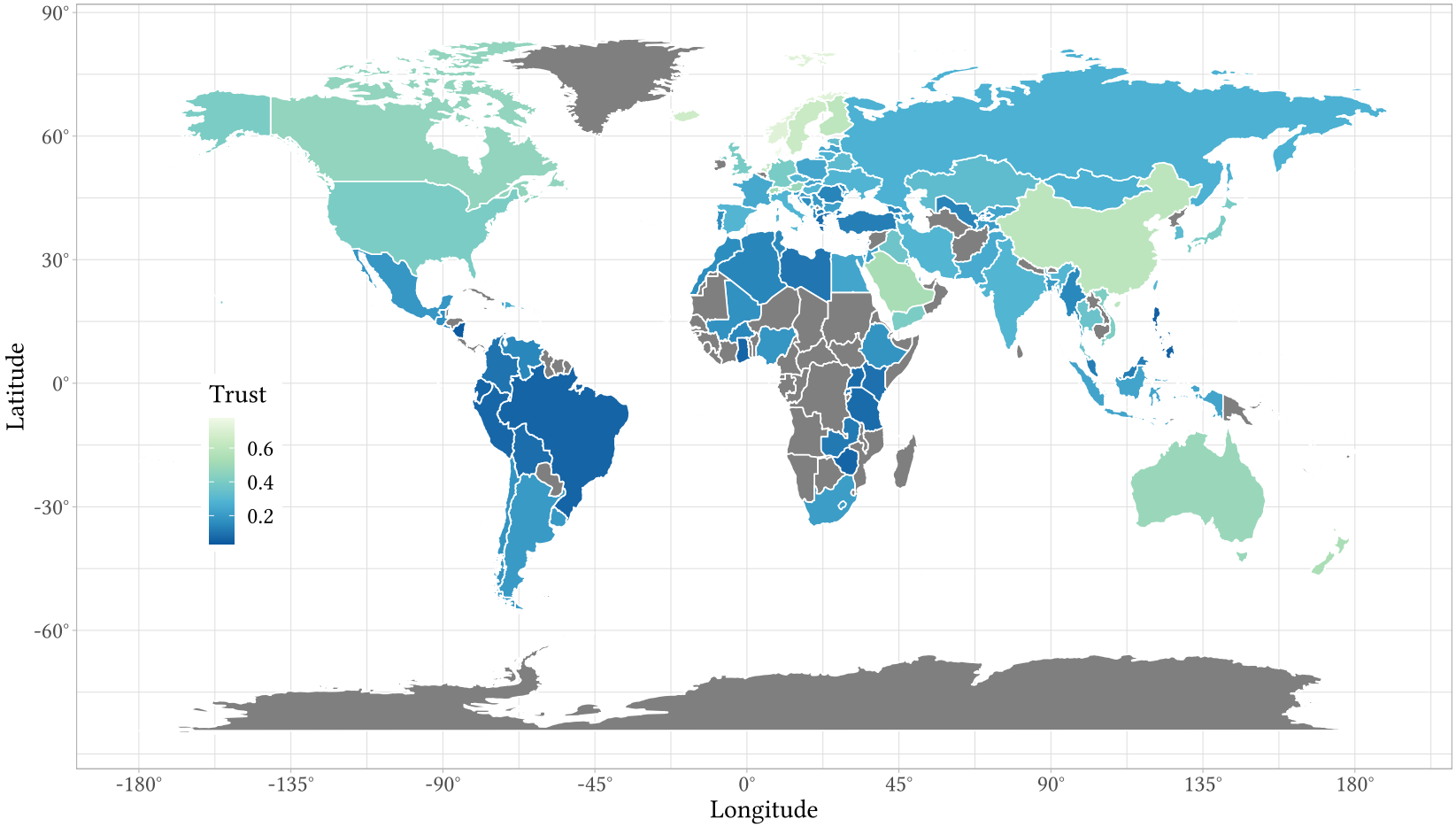


Figure IA1. Distribution of Trust across the World

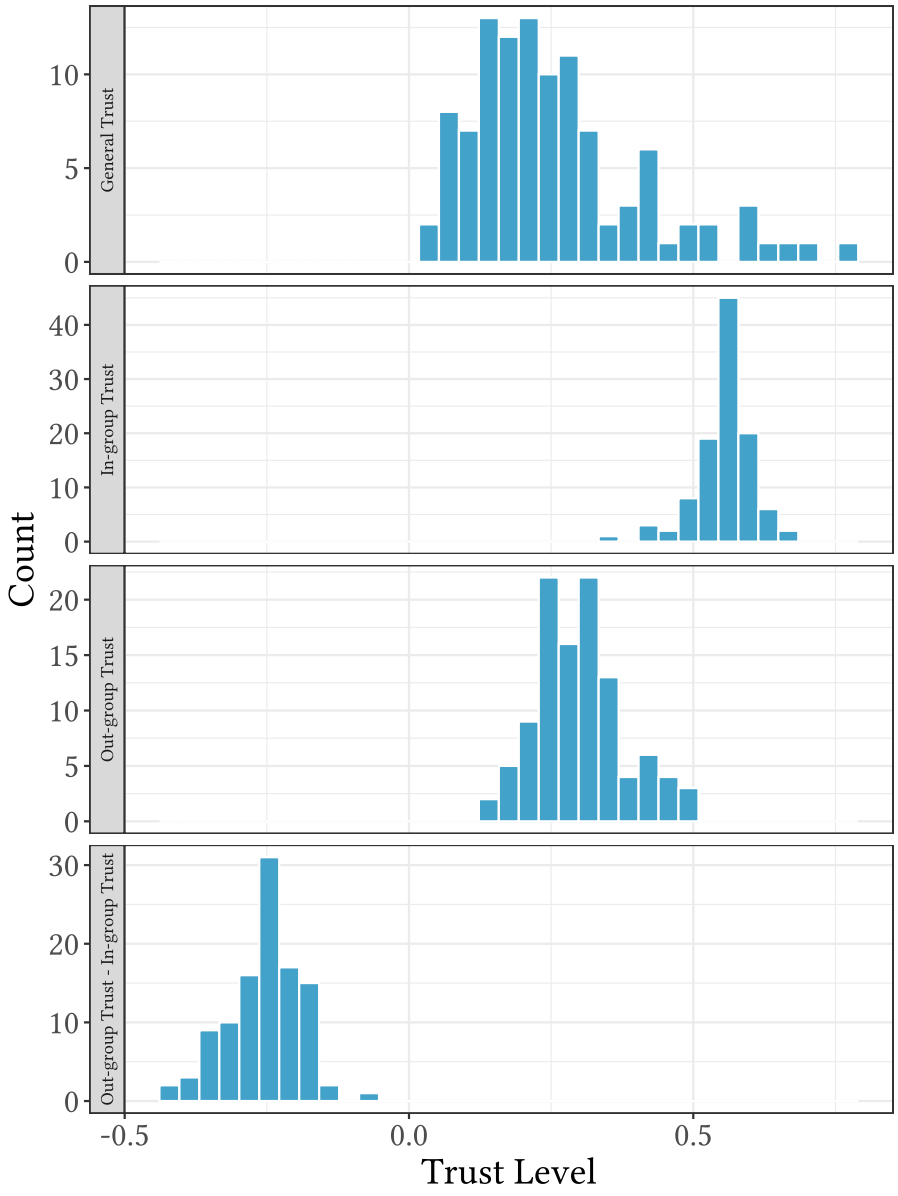


Figure IA2. Distribution of Trust in Different Groups

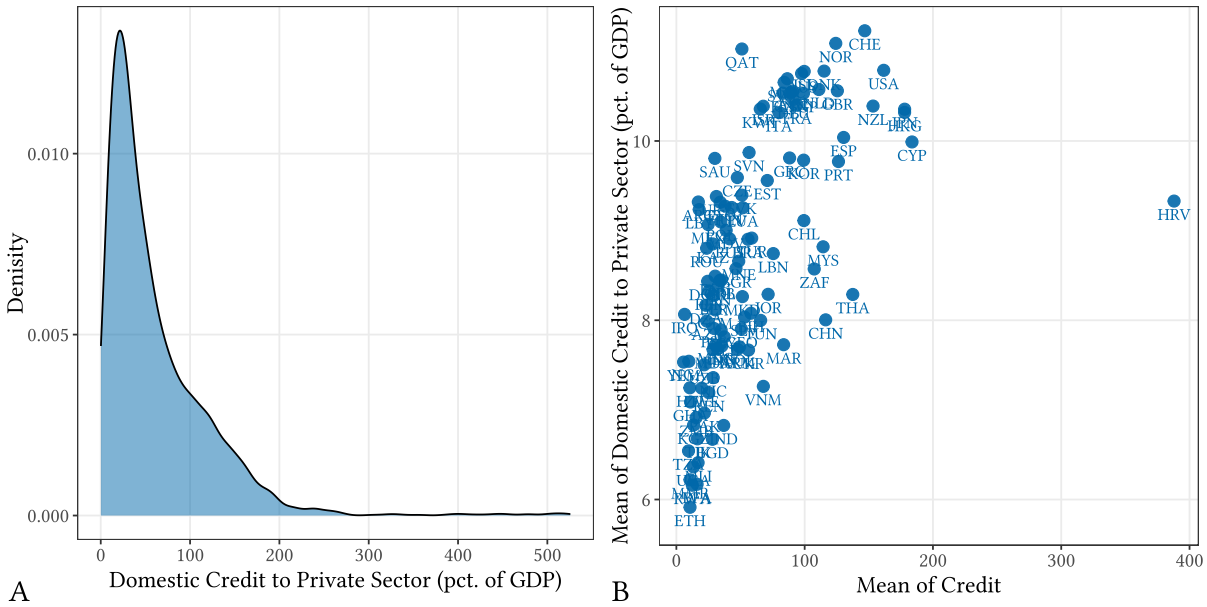
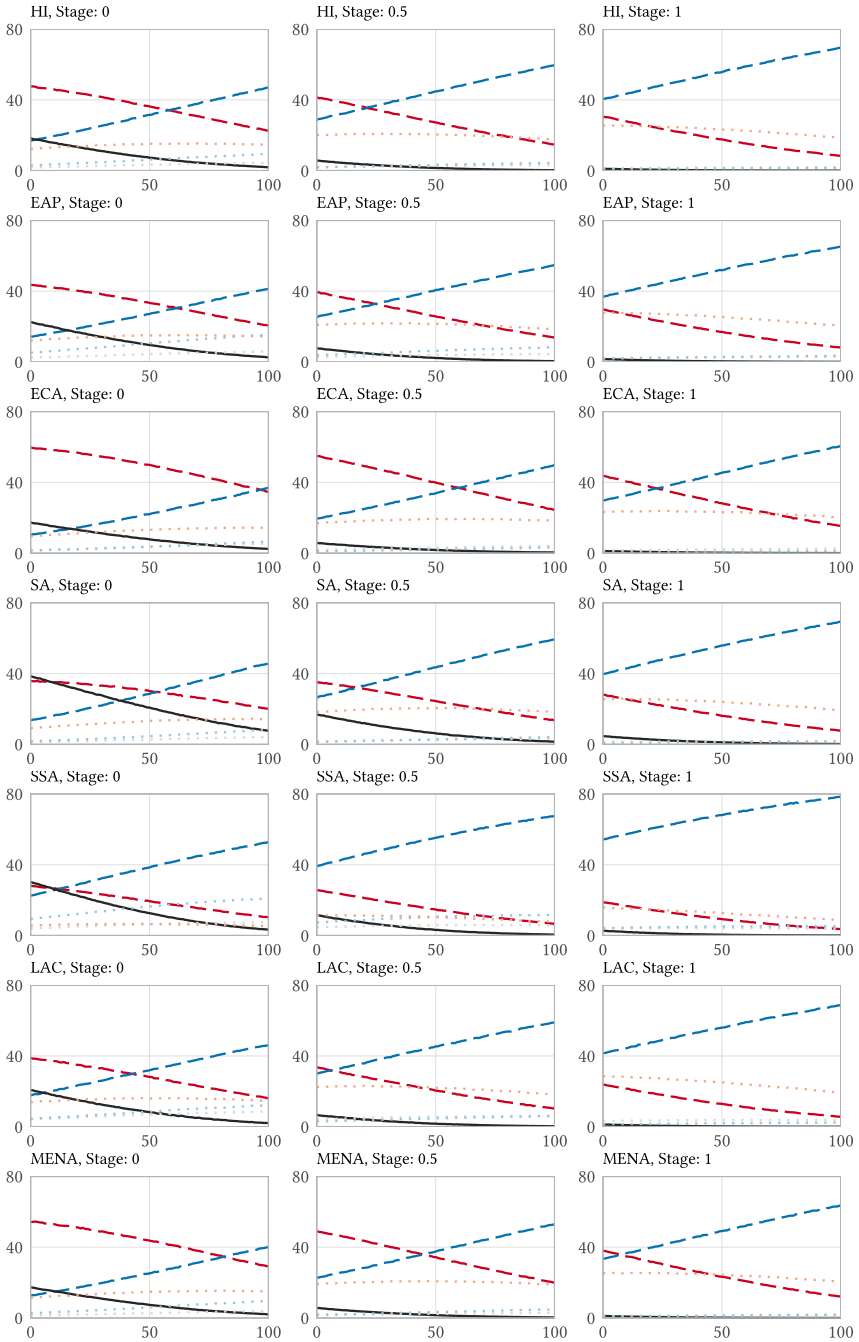


Figure IA3. Summary Statistics: Domestic Credit to the Private Sector

Notes: This figure shows the summary statistics of, *credit*, domestic credit to the private sector (pct. of GDP) in the raw data set. The sample set is an unbalanced panel from 1985 (the in-sample earliest) to 2022. Panel A displays the density function. In Panel B, we calculate the average *credit* and average log GDP per capita within the time span for each country, and draw scatter plots. As it shows, the scatter named "HRV" (Croatia) appears as an obvious outlier due to the too-large average *credit*. Also, Panel A corroborates that values above 300 are apparent outliers.

Figure IA4. Predicted Probability: Robustness and Comparison among Cases



Notes: The predicted probabilities of emergency fund sources in different cases, based on the main multinomial probit model, are compared to Figure 7. The table includes seven rows representing various World Bank-defined regions (see Section 4). The stage is denoted as k for income level and education, aiming to capture diverse scenarios.

Table IA1. Trust, Credit Growth, and GDP Growth: Robustness

Dependent Variable:	Δ_t log(GDP per Cap.)					
	1985-2000		2000-2020		1990-2020	
Model:	(1)	(2)	(3)	(4)	(5)	(6)
log(GDP per Cap.)$_t$	-0.014	-0.012	-0.295***	-0.306***	-0.316***	-0.363***
	(0.060)	(0.060)	(0.042)	(0.041)	(0.086)	(0.077)
Trust	1.11***	0.735*	1.27***	1.07***	1.66**	0.832
	(0.370)	(0.399)	(0.405)	(0.357)	(0.762)	(0.584)
Credit Growth		0.442*		0.253**		0.696***
		(0.253)		(0.114)		(0.231)
Fit statistics						
Observations	44	44	51	51	39	39
R^2	0.114	0.147	0.509	0.531	0.408	0.535

Notes: This table shows the robust tests of Table 1. The dependent variable is the log difference of GDP per capita. The independents are the log GDP per capita in 1985, trust level, and the credit growth, i.e., the changes in domestic credit to the private sector. In Column (1)-(2), the starting and ending year are 1985 and 2000, respectively. The time span is reduced to half the baseline. The sample set includes all the countries with available credit and trust data. Similarly, the time period is set to 2000-2020 in Column (3)-(4), and 1990-2020 (same time span but different start year as baseline) in Column (5)-(6). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA2. Trust and Borrowing Choices: Out/In-Group Trust

Dependent Variables:	Borrowing Difference					Δ_t Borrowing Difference		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	4.08***	4.05***	1.57***	1.22***	1.70***	1.23***	1.81***	0.881**
	(0.479)	(0.462)	(0.372)	(0.380)	(0.584)	(0.358)	(0.338)	(0.343)
Δ Out/In-group Trust	8.58***	8.63***	3.63***	2.87**	6.46***	2.02**	3.14***	1.93**
	(1.40)	(1.38)	(1.35)	(1.31)	(1.74)	(0.916)	(1.05)	(0.959)
Log GDP p.c. 2010				0.264***	0.086			0.371***
				(0.085)	(0.128)			(0.054)
Lag Borrowing Difference							-0.155***	-0.342***
							(0.042)	(0.050)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	378	378	378	374	257	276	276	273
R^2	0.323	0.362	0.688	0.696	0.740	0.070	0.272	0.381

Notes: Country-level OLS estimates. In column (1)-(5), the dependent, *Borrowing Difference*, is the population share (among adults) of borrowing from financial institutions minus the population share of borrowing from family / friends. In column (6)-(8), the dependent, Δ_t*Borrowing Difference*, is the change of *Borrowing Difference* comparing to the previous wave. The dependent variables are expressed as z-scores. The main independents include general trust level and trust difference between out-group (trust in people met in the first time, other region, and foreigners), and the in-group (trust in family, friends, and people one knows). Country-level historical GDP per capita is controlled. Lag value is used as a control when the dependent is Δ_t*Borrowing Difference*. Fixed effects include the survey wave (four in total, 2011, 2014, 2017, and 2021), and the region (seven in total, divided by the World Bank). Historical controls include country-level average amount in 2010 of ATMs / bank branches per 1,000 km / 10,000 adults, respectively. These controls are missing for some countries, resulting in a smaller sample size in column (5). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA3. Trust and Savings: Out/In-Group Trust

Dependent Variables:	Saving at FI					Δ_t Saving at FI		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	4.01***	3.99***	2.75***	2.30***	2.37***	0.250**	0.540***	0.493***
	(0.207)	(0.204)	(0.220)	(0.200)	(0.338)	(0.114)	(0.156)	(0.160)
Δ Out/In-group Trust	5.54***	5.58***	2.17***	1.16**	1.75*	0.441	0.852**	0.680*
	(0.612)	(0.600)	(0.532)	(0.508)	(0.892)	(0.307)	(0.376)	(0.354)
Log GDP p.c. 2010				0.326***	0.333***			0.083***
				(0.038)	(0.069)			(0.021)
Lag Saving at FI							-0.074**	-0.153***
							(0.029)	(0.033)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	378	378	378	374	257	276	276	273
R^2	0.593	0.613	0.786	0.827	0.832	0.029	0.057	0.125

Notes: Country-level OLS estimates. In column (1)-(5), the dependent, *Saving at FI*, is the population share (among adults) of saving at financial institutions. In column (6)-(8), the dependent, Δ_t*Saving at FI*, is the change of *Saving at FI* comparing to the previous wave. Dependent variables are expressed as z-scores. The main independents include general trust level and trust difference between out-group (trust in people met in the first time, other region, and foreigners), and the in-group (trust in family, friends, and people one knows). Country-level historical GDP per capita is controlled. Lag value is used as a control when the dependent is Δ_t*Saving at FI*. Fixed effects include the survey wave (four in total, 2011, 2014, 2017, and 2021), and the region (seven in total, divided by the World Bank). Historical controls include country-level average amount in 2010 of ATMs / bank branches per 1,000 km / 10,000 adults, respectively. These controls are missing for some countries, resulting in a smaller sample size in column (5). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA4. Trust and Credit Card Ownership: Out/In-Group Trust

Dependent Variables:	Credit Ownership					Δ_t Credit Ownership		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	3.35***	3.34***	2.05***	1.50***	1.96***	0.197	0.365**	0.346**
	(0.268)	(0.266)	(0.239)	(0.222)	(0.299)	(0.120)	(0.163)	(0.164)
Δ Out/In-group Trust	5.59***	5.62***	2.14***	0.923*	0.998	0.170	0.472	0.454
	(0.679)	(0.673)	(0.644)	(0.558)	(0.847)	(0.209)	(0.288)	(0.288)
Log GDP p.c. 2010				0.391***	0.242***			0.053***
				(0.037)	(0.056)			(0.018)
Lag Credit Ownership							-0.053*	-0.119***
							(0.030)	(0.038)
Historical Controls					Yes			
Wave FE		Yes	Yes	Yes	Yes		Yes	Yes
Region FE			Yes	Yes	Yes			
Observations	378	378	378	374	257	276	276	273
R^2	0.498	0.504	0.730	0.790	0.854	0.018	0.047	0.075

Notes: Country-level OLS estimates. In column (1)-(5), the dependent, *Credit Ownership*, is the population share (among adults) of owning a credit card. In column (6)-(8), the dependent, Δ_t*Credit Ownership*, is the change of *Credit Ownership* comparing to the previous wave. The dependent variables are expressed as z-scores. The main independents include general trust level and trust difference between out-group (trust in people met in the first time, other region, and foreigners), and the in-group (trust in family, friends, and people one knows). Country-level historical GDP per capita is controlled. Lag value is used as a control when the dependent is Δ_t*Credit Ownership*. Fixed effects include the survey wave (four in total, 2011, 2014, 2017, and 2021), and the region (seven in total, divided by the World Bank). Historical controls include country-level average amount in 2010 of ATMs / bank branches per 1,000 km / 10,000 adults, respectively. These controls are missing for some countries, resulting in a smaller sample size in column (5). Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA5. Country Trust Levels and the Non-applicable Questionnaire for Saving at Informal Places

Dependent variable:	Non-applicable Questionnaire for Saving at Clubs or Friends							
	Wave 2011	Wave 2014	Wave 2017	Wave 2021	All Waves			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Trust	1.332***	1.370***	1.465***	1.382***	1.394***	0.381***	0.637***	0.314***
	(0.210)	(0.184)	(0.205)	(0.174)	(0.095)	(0.094)	(0.153)	(0.084)
Log GDP p.c. 2010						0.150***		0.150***
						(0.011)		(0.015)
Account Ownership							0.652***	0.064
							(0.133)	(0.062)
Wave FE								Yes
Region FE								Yes
Pseudo R^2	0.259	0.374	0.352	0.391	0.341	0.705	0.545	0.760
Observations	98	102	104	98	402	398	402	398

Notes: The table aims to show the potential relationship between the main interest, *Trust*, and the sample selection bias in questions about informal savings by an economy-level probit model. Estimated average marginal effects are reported after estimating the probit specification:

$$Pr(Y_{kt}|X_{kt}) = \Phi(\alpha + \beta \times Trust_k + X'_{kt} \times \gamma + \eta_t + \epsilon_{kt}).$$

Each observation is an economy k in a specific wave t. The dependent, Y_{it}, is a dummy which equals to 1 if the corresponding index value of *saving at clubs or friends* is NA, i.e., in wave t, no questions about "Save at saving clubs, stores, or friends" are asked to the respondents in economy k. The main independent of interest is the economy trust level. Historical GDP per capita is controlled as a proxy of economic development level. Total account ownership rate of the economy, the wave fixed-effect, and the region fixed-effect are also controlled. The results show that the absence of above-mentioned samples is positively related to trust levels. Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA6. Country Trust Levels and Sources of Emergency Funds for Individuals: A Multinomial Probit Model

	Source of Emergency Funds: (Benchmark: Working)				
	Impossible	Financial Institutions	Family / Friends	Asset Selling	Others
	(1)	(2)	(3)	(4)	(5)
Variables					
Trust	−0.765***	0.816***	−0.325**	0.195***	0.257***
	(0.215)	(0.154)	(0.139)	(0.072)	(0.065)
Personal Account	−0.407***	0.200***	−0.248***	−0.135***	−0.081**
	(0.071)	(0.059)	(0.043)	(0.026)	(0.033)
Female	−0.113***	−0.052***	−0.033***	−0.075***	−0.016
	(0.018)	(0.013)	(0.011)	(0.014)	(0.017)
Age	0.007***	0.013***	0.001	0.006***	0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Income	−0.715***	0.225***	−0.296***	−0.436***	−0.078*
	(0.126)	(0.078)	(0.060)	(0.037)	(0.042)
Education	−0.529***	0.196***	−0.208***	−0.288***	−0.108***
	(0.100)	(0.064)	(0.051)	(0.031)	(0.035)
Log GDP p.c.	−0.214***	0.161***	−0.089**	−0.072**	0.015
	(0.054)	(0.045)	(0.038)	(0.033)	(0.033)
Covariance Matrix					
Impossible	0.868***	0.782***	0.623***	0.347***	0.060
	(0.215)	(0.152)	(0.106)	(0.085)	(0.106)
Financial Institutions		2.321***	1.023***	0.156	0.134
		(0.439)	(0.216)	(0.128)	(0.132)
Family / Friends			0.976***	0.120	0.034
			(0.136)	(0.148)	(0.147)
Asset Selling				0.521***	0.051
				(0.073)	(0.062)
Others					0.313***
					(0.071)
Country-level Controls: Yes			Historical Controls: Yes		
Observations: 126729					

Notes: Individual-level multinomial probit model. The model is defined by the $(p-1)$ -dimensional latent variable $U_{ikt} = (U_{ikt}^1, \cdots, U_{ikt}^{p-1})$ and the response variable Y_{ikt},

$$U_{ikt} = \beta \times Trust_k + X'_{ikt} \times \gamma + K'_{kt} \times \delta + \eta_t + \epsilon_{ikt}, \quad \epsilon_{ikt} \sim \mathcal{N}(0, \Sigma);$$
$$Y_{ikt} = j \times \mathbb{I}\left\{ \max_{j \in \{1,\cdots,p-1\}} (U_{ikt}) = U_{ikt}^j, U_{ikt}^j > 0 \right\},$$

where β is a $(p-1) \times 1$ vector of coefficients of *Trust* w.r.t. different options, Σ is a $(p-1) \times (p-1)$ positive definite covariance matrix. There are $p = 6$ kinds of options, where the benchmark source of emergency funds is set to be *working*. The individual control, X_{ikt}, includes: gender dummy, age, income level within the country (five levels from lowest to highest, normalized to 0 to 1), and education level (three levels from lowest to highest, normalized to 0 to 1). Country-level control, K_{kt}, includes: population share of owning an account, log GDP per capita, average amount of ATMs / bank branches per 1,000 km / 10,000 adults in the year of each wave, and historical values of these listed variables in 2010. Wave effect is fixed. Standard errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA7. Trust and Regulation Tightness: Examination on Sub Samples

Panel A: Activity Restriction (ACT).										
Sub-sample:	Wave I		Wave II		Wave III		Wave IV		Wave V	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trust	-4.54***		-2.89**		-2.96**		-2.90**		-4.20***	
	(1.60)		(1.22)		(1.16)		(1.39)		(1.17)	
Out-group Trust		-6.39		-7.45**		-2.84		-4.08		-5.39
		(4.70)		(3.20)		(3.16)		(3.00)		(3.84)
Log GDP p.c. 1995		-0.397		-0.268		-0.517**		-0.583**		-0.586**
		(0.315)		(0.276)		(0.233)		(0.246)		(0.283)
Region FE		Yes		Yes		Yes		Yes		Yes
Observations	81	78	85	82	83	77	82	77	92	86
R^2	0.101	0.350	0.054	0.290	0.069	0.281	0.051	0.345	0.104	0.347
Panel B: Capital Regulation (CAP).										
Sub-sample:	Wave I		Wave II		Wave III		Wave IV		Wave V	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trust	-0.411		-0.828		-0.726		-1.80		-1.70*	
	(1.41)		(1.06)		(1.34)		(1.26)		(0.995)	
Out-group Trust		0.573		-0.538		0.397		-8.15**		-7.15**
		(3.78)		(3.23)		(4.08)		(3.86)		(2.95)
Log GDP p.c. 1995		-0.045		0.287		0.493		-0.184		0.054
		(0.228)		(0.228)		(0.296)		(0.281)		(0.209)
Region FE		Yes		Yes		Yes		Yes		Yes
Observations	79	76	82	79	84	78	83	78	92	86
R^2	0.001	0.206	0.007	0.121	0.004	0.085	0.024	0.206	0.032	0.127

Notes: This table aims to show the same implication as columns (1), (4), (5), and (8) of Table 7 but by running regression on sub-samples of each wave. In Panel A, the dependent variable is the index of overall restrictions on bank activities. In Panel B, the dependent is the index of bank capital regulations. The main independents of interest are the proxies of trust, including general trust, and the trust level within the out-group (trust in people met in the first time, other region, and foreigners). Almost all the estimated coefficients of the proxies of trust are negative, thus confirm the results of Table 7, i.e., low trust is associated with tight regulation. The only exceptions are columns (1) and (3) in Panel B. This also echos the implication of the corresponding median from Table 6, i.e., in the beginning of the twenty-year duration, low-trust economies have relatively loose rules in bank capital regulation. Due to too-small sub-sample sizes, there are definite decrements of the statistical power. Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA8. Trust and Regulation Tightness: Fraction of Bank Entry Applications Denied

Dependent Variables:	$\mathbb{I}\{DENY > 0\}$		DENY			
Method & Sample:	Probit, Full		OLS, $\mathbb{I}\{DENY > 0\}$		OLS, Full	
	(1)	(2)	(3)	(4)	(5)	(6)
Trust	-1.17**	-0.706	-0.335***	-0.219	-0.263***	-0.054
	(0.486)	(0.676)	(0.115)	(0.208)	(0.060)	(0.112)
Log GDP p.c. 1995		0.031		-0.047**		-0.032*
		(0.106)		(0.023)		(0.017)
Wave FE		Yes		Yes		Yes
Region FE		Yes		Yes		Yes
Observations	267	267	115	115	267	267
R^2			0.039	0.390	0.036	0.217

Notes: Economy-level regressions on how trust relates to the fraction of bank entry applications denied (DENY). Regarding the large proportion of zero values, we use the dummy, $\mathbb{I}\{DENY > 0\}$, as dependent in columns (1) and (2). The dependent in columns (3)-(6) is the raw value of *DENY*. Columns (3), (4) use a sub sample that only contains non-zero (positive) values of DENY, whereas (5), (6) use the full sample. Columns (1), (2) use probit specification, and (3)-(6) are OLS estimates. Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.

Table IA9. Trust, Regulation Tightening, and GDP Growth: Examination on Sub Samples

Dependent Variable:	Average Growth Rate of GDP p.c., 2000-2020			
Sub-sample:	Low-trust Group		High-trust Group	
	(1)	(2)	(3)	(4)
Δ_t Regulation	0.017	0.018	-0.042***	-0.021
	(0.020)	(0.020)	(0.015)	(0.013)
Income: Low		-0.008		
		(0.009)		
Income: Lower Middle		0.008		0.048***
		(0.011)		(0.009)
Income: Upper Middle		0.010		0.041***
		(0.013)		(0.011)
Observations	30	30	31	31
R^2	0.038	0.070	0.166	0.587

Notes: This table aims to show the same implication as Table 8 but by running regression on sub-samples rather than introducing dummies. The advantage is the coefficients are better interpreted, while the drawback is the definite decrement of the statistical power due to too-small sub-sample sizes. In column (1)-(2), the sub-sample is the economies in the low-trust group, while the observations in column (3)-(4) are high-trust economies. The dependent variable is the average growth rate of GDP per capita from 2000 to 2020. The main independent variable is the change of the regulation tightness over the twenty years, Δ_t*Regulation*, which equals to the value of the overall restrictions on bank activities index in the latest survey minus the value in the first survey. Since the GDP growth rate relates to the current GDP level, we introduce the income level (defined and divided by World Bank) dummies as controls, where the benchmark is High-income countries. It is basically equivalent to fix the income level effect. Although the significance drops, the positive estimated coefficients in (1)-(2) and the negative in (3)-(4) are consistent with the results in Table 8. The comparison suggests that the regulation tightening has opposite relation with the economic growth in two groups. Heteroskedasticity-robust standard-errors in parentheses. ***,**,* indicate statistical significance at the 1%, 5% and 10% respectively.