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Are modern financial systems shaped by state antiquity?



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ABSTRACT

We demonstrate that existing differences in financial development between countries can be explained by the cumulative variations in their levels of state experience since 1 AD. This dimension of early historical development has not been considered so far in studies that analyze the determinants of financial development. The estimation allows for all major theories established in the literature as possible explanations for the disparity of financial development across the globe. Significance of state antiquity is robust to the use of alternative indicators of financial development, the consideration of different lengths and periods of statehood, and controlling for a range of variables or country characteristics. Our results highlight the important role of statehood in propelling financial system development, and thus provide some support to the view that historically determined differences in the early-start developmental advantage provide the basis for explaining the fundamental sources of variations in financial development between countries today.

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1. Introduction

Following the lead of Rajan and Zingales (2003), recent literature that analyzes financial development using a political economy framework has often emphasized the importance of a government's fiscal and legal capabilities in shaping the financial sector's subsequent development (see, e.g., Haber et al., 2008; Besley and Persson, 2009; Becerra et al., 2012). We build on these contributions and argue that the early existence of state government confers a developmental head start, which provides conditions conducive to shaping financial institutions and markets. Such an early-start developmental advantage enables the state government to solidify power and create a strong bureaucracy (Chhibber, 1997; Bockstette et al., 2002; Chanda and Putterman, 2007), thereby strengthening its fiscal and legal capabilities (Besley and Persson, 2009; Becerra et al., 2012). Consequently, the state's ability to borrow and repay debt is enhanced, along with its capacity to create financial intermediaries and shape their development through regulation and legislation. These state operations have exerted long-lasting and deep influences on the shaping and development of the modern financial architecture, which may thus account for

the persistent underdevelopment of financial systems in many countries today (Sylla et al., 1999).¹

Financial development is widely regarded as a necessary precondition for fostering growth because it enhances the ability of an economy to mobilize domestic resources, allocate capital to productive investments, ameliorate risks and mitigate financial market imperfections through reduced transaction costs, informational asymmetries and contract enforcement costs (King and Levine, 1993; Levine, 1997, 2005; Rajan and Zingales, 1998; Aghion et al., 2005; Ang and McKibbin, 2007; Ang, 2008). Sylla (2002) notes that the most successful nation states in history, including the Netherlands, the United Kingdom and the United States, have all experienced financial revolutions which precipitated the modernization of their financial systems before they became the world leaders in the pre-modern eras. Hence, current and past differences in economic development across countries can be attributed to the disparity in financial systems' sophistication. This view has received widespread support in academic debate as well as in policy circles, and has subsequently led many policy makers

¹ The role of the state in various stages of development has recently received a lot of attention in the development and political economy literature. These studies have focused on state ownership of banks (La Porta et al., 2002; Andrianova et al., 2008), size of the state (Alesina and Spolaore, 2003), quality of the state (Tabellini, 2005), state capacities (Acemoglu, 2005; Besley and Persson, 2009), state capitalism (Bremmer, 2009), and state stability (Desmet et al., 2011). By contrast, our focus in this study is the length of state experience.

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to implement reform programs in order to deepen and strengthen their financial systems. While the perceived benefits of financial development are well-established, these efforts have not always generated the desired outcomes in the sense that financial development remains highly uneven across the globe and few countries today have achieved modern financial systems.²

Using the average ratio of private credit to GDP over the period 2000–2009 as a rough measure of financial system sophistication, European countries are at least four times financially deeper than African countries. Interestingly, the level of financial depth is also highly dispersed among countries with similar income levels. Among the low-income countries, the median credit-to-output ratio is only 12%, but the bottom one fifth of these countries have ratios below 6% whereas the upper one fifth have ratios above 22%. On the other hand, the median high-income country has a credit-to-output ratio of 102%, but about one fifth of them have ratios below 56% whereas at the other end of the distribution one fifth have ratios above 150%.³ This highlights the fact that, as opposed to the demand-led proposition of Robinson (1952), financial development is not entirely driven by the demand for financial services, given that there is substantial heterogeneity in financial development across countries with similar levels of economic development.

Why are some countries financially sophisticated whereas others financially backward? The literature offers several alternative explanations. The most influential theories regarding the determinants of financial development are the *law and finance theory* and the *endowment theory*. The *law and finance theory* advocated by La Porta et al. (1997, 1998) holds that the legal tradition of a country matters for its subsequent financial development. According to this theory, British common law was designed to protect the rights of private property owners against the state government. In contrast, French civil law was created to solidify state power through restricting the courts from intervening in national policy in favor of the elites. Consequently, a state-focused legal system will be inclined to distort efficient allocation of resources in favor of interest groups, and this may hinder the creation of an efficient financial system. Hence, this theory predicts that countries with a British common law tradition, which tends to place more emphasis on private property protection, will enjoy higher levels of financial development compared to those that inherit a French civil law tradition (Beck et al., 2003). While this argument is intuitively appealing, it does not accord well with the observation that financial development varies substantially among countries with the same legal traditions (Becerra et al., 2012).

On the other hand, the *endowment theory* focuses on the colonial conditions such as geographic factors and the disease environment in shaping subsequent institutional and financial development. This theory, popularized by Acemoglu et al. (2001), proposes that there were different types of colonization strategies pursued by the European colonizers. In those favorable environments, the Europeans settled and installed property rights institutions that protected private property contracts, which subsequently promoted financial development. These countries include Australia, New Zealand and the United States. In those environments in which diseases were prevalent such as the Congo, the Ivory Coast and most Latin American countries where settlement was infeasible, extractive institutions were created, which empowered the elite to extract resources. Under these environments, Beck

et al. (2003) argue that institutions which favored the operation of free financial markets were not established since they would restrict the power of the extractors. Hence, according to this theory, financial development is shaped by differences in endowments and initial institutions.

The *power and information theories of credit*, on the other hand, stress the importance of creditor protection and information sharing in reducing financial market frictions and deepening financial systems. The power theory of credit is based on the argument that financial intermediation will be higher if repayment can be more easily enforced through obtaining collaterals and gaining control over firms, as stressed in the theoretical work of Townsend (1979) and Aghion and Bolton (1992). The information theory of credit, on the other hand, proposes that in the absence of informational symmetry lenders cannot distinguish between honest and dishonest borrowers, thus resulting in the incorporation of a lemons premium into the market interest rate and credit rationing (Jaffee and Russell, 1976; Stiglitz and Weiss, 1981). These theories highlight that better creditor protection and information sharing will encourage financial intermediating activities and lead to higher financial development, as emphasized by Djankov et al. (2007).

The *culture-religion* view advocated by Stulz and Williamson (2003) proposes that culture matters for financial development since it affects values, beliefs, institutions and how resources are allocated in an economy. Creditor rights differ significantly among Catholic and Protestant countries. The Catholic culture, for instance, does not emphasize private property protection and hence does not promote capitalism. Moreover, the charging of interest on loans is viewed negatively and creditor rights are traditionally not emphasized in countries dominated by Catholic religions. Another distinctive contrast between the Protestant and Catholic cultures, as discussed in Stulz and Williamson (2003), is that Protestants stress individual faith whereas Catholics emphasize knowledge, thus creating a hierarchical centralized structure where the majority are guided by erudite leaders. Centralization increases the power of politicians, and, therefore, the likelihood of resource misallocation. Such centralization of power may also promote more spending on religious and military activities that diverts resources away from investment in the productive sectors. Hence, Catholic countries tend to have worse creditor rights and less developed financial systems than do Protestant countries.

While these factors may have some explanatory power in uncovering what shapes financial system development across the globe, another possible dimension that has not been considered in the literature so far is the advantage of an early state developmental head start. We argue that societies which have a long state presence enjoy an early developmental head start, which confers on them the continuing advantage of a government with strong bureaucratic capabilities that is important for the shaping of financial development. Our indicator of the length of state experience, or state antiquity, is obtained from Putterman (2004). These data capture the presence of a polity above tribal level within the contemporary boundaries for each country over the last two millennia. Potential endogeneity, spurious regressions and specification problems are dealt with using measures of genetic distance to the global frontier, the overall technology adoption rate and geographical distance to the regional frontier as instruments for state antiquity. Our empirical evidence strongly suggests that variations in financial development can be explained by the length of statehood. This finding prevails even after a series of robustness checks is carried out.

This study complements those of Bockstette et al. (2002), Chanda and Putterman (2007), Putterman (2008) and Putterman and Weil (2010), who use different versions of the above dataset and find that state antiquity is often associated with better contemporary economic outcomes such as higher income levels or

² According to Sylla (2002), countries that possess a modern financial system should have an effective central bank, sound institutional investors (e.g., insurance companies), stable monetary policy, well-functioning banking systems, securities markets for debt, equity and other money-market instruments as well as efficient public finance and public debt management.

³ These data are based on our sample of 107 countries over the period 2000–2009 (source: the World Bank's Financial Development and Structure database).

growth and lower income inequality. Our work is also related to La Porta et al. (1997, 1998), Beck et al. (2003), Stulz and Williamson (2003) and Djankov et al. (2007), among others, who propose and test different theories of financial development. Consistent with these theories, we find some evidence that the dispersion of financial development across countries can be explained by legal origins, geographic endowments, creditor protection and information sharing, and religions. However, none of these factors overturn our results. The estimates are remarkably robust when we include control variables measuring these effects.

The paper proceeds as follows. The next section sets out the analytical framework that links the effect of state antiquity to financial development. Section 3 discusses the data, variables construction and econometric procedures. The results are presented and discussed in Section 4. Section 5 provides some robustness checks and the last section concludes.

2. How do experienced states deepen financial systems?

Sylla (2002) argues that a well-functioning financial system is the precursor of economic modernization and emphasizes the role of the state in propelling the development of financial systems. Historically, effective leadership of state governments played a prominent role in precipitating the financial revolutions in Japan and the United States, which subsequently modernized their financial systems and enabled their economies to grow rapidly to become major players on the world stage. The enviable growth experiences of the East Asian miracles that have been backed by powerful states with a strong ability to tax and regulate is also consistent with this development (see, e.g., Wade, 1990). Hence, Sylla et al. (1999) argue that financial systems did not evolve according to some uniform patterns governed by the needs of industrial finance, but rather that they were the outcomes of historical processes shaped by the ability of the state to manage public finances and regulate financial markets and institutions. That state governments can play an active role in the development of financial systems has also been emphasized by Haber (2008), who argues that they can implement various mechanisms to ensure the smooth functioning of financial systems, such as providing insurance to depositors, enhancing contract enforcements, strengthening prudential regulations, and creating institutions that reduce the risk of expropriation.

A longer history of statehood may be favorable for improving the financial and institutional environment and deepening financial systems for several reasons. For instance, Chhibber (1997) and Bockstette et al. (2002) note that experienced and stable states tend to have more competent bureaucratic capabilities. In particular, long standing states may have more efficient public administration than newly formed states due to the advantage of having more experienced, trained civil servants, and literate, civilized citizens, and thereby are more likely to be equipped with strong fiscal and legal capabilities. They can therefore design effective rules that contribute to institutional and financial development. Chanda and Putterman (2007) also argue that a longer political integration strengthens national identity by fostering linguistic unity. A unified state can harmonize social interaction and enforce social norms and informal rules, thereby reducing political instability that may have devastating consequences on the stability of the financial system, as shown by Roe and Siegel (2011). Furthermore, a more integrated polity is often associated with a higher level of trust within society, and such social capital has been shown to be a significant determinant of financial development by Guiso et al. (2004).

In the model developed by Becerra et al. (2012), the government plays an important role in shaping the financial system because in

countries where the state has a limited capacity to tax, government officials may have the incentive to block financial system development and are more inclined to abuse the system by directing resources from it to finance their own operations, thus raising the cost of private capital and hindering financial intermediating activity. This is consistent with the general observation that government revenues as a percentage of GDP tend to be lower in poorer economies with underdeveloped financial systems. However, to the extent that the state has become more developed with greater fiscal power, the government would be more willing to lower restrictions on financial development and improve the institutional environment, thus providing conditions to increase credit flows to the private sector. Becerra et al. (2012) provide empirical evidence supporting this claim, showing that lower opposition to financial development by interest groups deepens financial systems only in countries which have a strong state capacity.

In an influential study, La Porta et al. (2002) document a statistically robust and negative relationship between initial state ownership of banks and subsequent financial development. These findings are consistent with the view that extensive government control of finance prevents the efficient allocation of resources and thus results in backward financial systems. To the extent that more experienced states tend to have a larger stock of fiscal and legal capacities, their ownership of banks would be lower since the incentive to exploit financial resources through manipulating state-owned banking institutions is weak. Thus, the findings of La Porta et al. (2002) imply that financial development is positively associated with state antiquity.

Besley and Persson (2009) also highlight the fact that countries with low investment in state capacities are often associated with weak abilities in raising tax and enforcing contracts and property rights, thus creating backward financial systems. In their model, better private property rights protection is linked to higher financial development, as emphasized by La Porta et al. (1998). Countries with a large stock of legal capacity are more effective at enforcing property rights protection and have better legal infrastructure, and this allows them to write more extensive financial contracts which promote financial intermediating activity. Such a stock of legal capital is positively associated with state antiquity, given that more experienced states incur lower costs in building legal capacity due to their stronger bureaucratic capabilities (Chhibber, 1997; Bockstette et al., 2002; Chanda and Putterman, 2007). Hence, these discussions suggest that severe constraints on the ability of the state to tax and to regulate due to the lack of experience could stunt financial development. However, despite these contributions, the primacy of the role of statehood in financial development has so far not been empirically tested in the literature.

3. Model specification and data

This section discusses the empirical strategy pursued to evaluate the impact of state history on contemporary financial development.

3.1. Empirical specification

The following regression model is estimated using cross-sectional data for 107 countries:

$$FinDev_i = \alpha + \beta STATE_i + \gamma' controls_i + \varepsilon_i \quad (1)$$

where *FinDev* is an indicator of financial development, *STATE* is state antiquity described below, *controls* is a set of control variables included in the regressions to allow for the influence of geographic effects, other determinants of financial development established in

the literature, and continent-specific heterogeneity, and ε is a stochastic error term. Except for the robustness check in Table 5, financial development is measured as the ratio of private credit to GDP throughout the paper. Definitions of all variables and their sources are listed in Table A4 in Appendix B.

3.2. Measuring financial development

The average ratio of private credit to GDP over the period 2000–2009 is used as our benchmark measure of financial development. This measure focuses on credit issued to the private sector by deposit money banks and other financial institutions while excluding lending extended to the public sector. Robustness of the results is also performed using alternative indicators, including the ratios of liquid liabilities to GDP, deposit money bank assets to GDP, stock market total value traded to GDP, stock market capitalization to GDP and stock market turnover. An alternative period, from 1960 to 2009, for the private credit measure is also used. Furthermore, we also construct a summary index of financial development using the approach of principal component analysis. The data are obtained from the World Bank's Financial Development and Structure database compiled by Beck and Demirgüç-Kunt (2009).

3.3. Measuring state antiquity

Our focus variable, state antiquity, is measured using the data of Putterman (2004) (version 3.1) on the presence of state government, spanning 39 half centuries from 1 AD to 1950 AD for 151 countries. This index of state history gives a score from 0 to 50, reflecting: (1) the presence of a government above the tribal level ($ST^{PRESENCE}$); (2) whether this government is foreign or locally based ($ST^{AUTONOMY}$); and (3) the proportion of the current territory covered by this government ($ST^{COVERAGE}$). The original source of these data is *Encyclopaedia Britannica*.

$ST^{PRESENCE}$ distinguishes tribal societies from state polities. Unlike supra-tribal polities, tribes tend to have temporary and unstable political integration which has no regular and systematic administration. A tribal-based system of rule is often adverse to social and economic change, constitutes incentive structures that encourage exploitation and hampers development. State polity, in contrast, provides a unified political system that equips its bureaucrats with effective legal and fiscal capabilities. For example, bureaucratic apparatus is evident in the historic presence of supra-tribal authorities in ancient Egypt, the Roman Empire and imperial China, suggesting that state presence is closely associated with the establishment of some systematic forms of administration.

$ST^{AUTONOMY}$ captures the degree to which domestic authorities are able to control activities within a state's boundaries. This dimension of state development distinguishes colonial from home rule. A locally-based government enjoys greater autonomy by being able to determine its own authority structures and internal affairs. On the other hand, states' abilities to exercise effective control within their boundaries are limited when they are subject to external hegemony or pledging allegiance to a more powerful rule where the ultimate sovereignty lies in another state. Consequently, the strength of a state's domestic influence is associated with its ability to accumulate self-governing administrative experience and develop a proficient local public bureaucracy. In the sample used in this study, China, Ethiopia and South Korea are among the countries that have enjoyed the highest levels of autonomy over the past two millennia.

$ST^{COVERAGE}$ refers to the territorial extent of a particular rule. The ability of a state in broadening its boundary and securing greater territorial influence reflects its capability in extending influence and solidifying authority by unifying different components of state under a centralized domestic administration or sovereignty. Coun-

tries which have always been able to maintain a strong territorial influence include Egypt, Jordan and Israel.

Specifically, state history for twenty centuries to 1950 AD is calculated as follows:

$$STATE_i = \frac{\sum_{t=1}^{39} (1.05)^{1-t} \cdot SA_{i,t}}{\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50} \quad (2)$$

where $SA_{i,t}$ is the state antiquity for country i for the 50-year period t and is calculated as the product of the above three components of state development.

A 5% discount rate is applied to each of the half centuries so that less importance is attached to states formed in the more distant past. The robustness of this assumption is checked by considering alternative decay rates of 0%, 1% and 10%, but the results are similar to the 5% rate. The index is converted to a scale from 0 to 1 where higher values reflect the presence of a longer state history. This approach to measuring state antiquity is consistent with Bockstette et al. (2002), Chanda and Putterman (2007), Putterman (2008), Putterman and Weil (2010) and Ang (2012, 2013). More details on the construction of this index, including ten country examples of how the index is formed, are provided in Appendix A (see Tables A2 and A3).

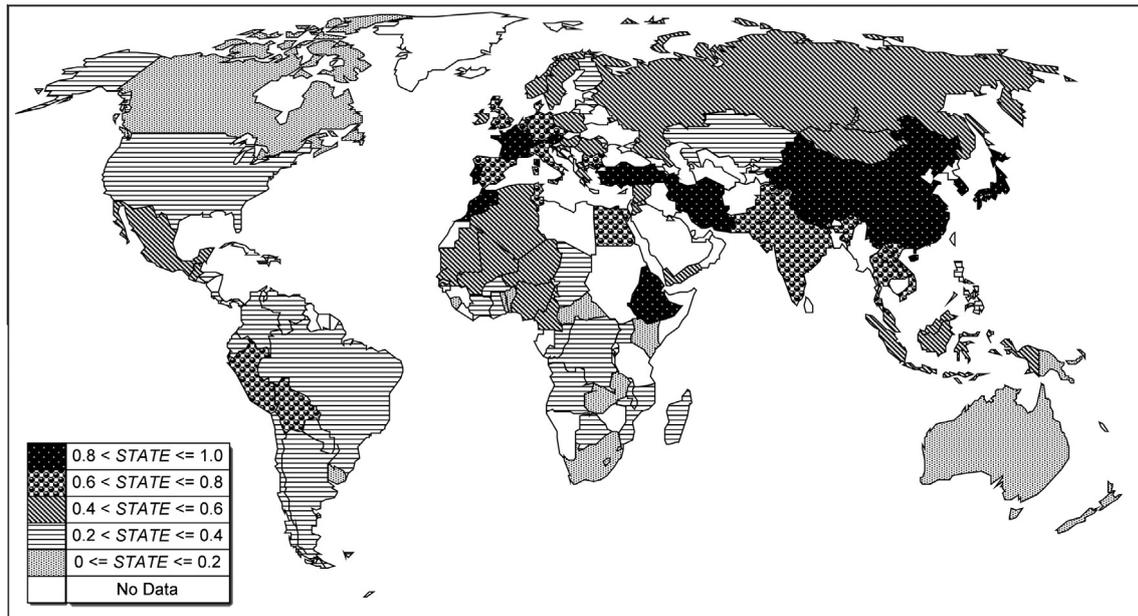
In addition, state experiences accumulated up to 500 AD, 1000 AD and 1500 AD will be considered in order to gain an understanding of how the length of state experience affects financial development. State antiquities since 1501 AD, 1651 AD and 1801 AD are also regressed to gauge how the importance of state antiquity evolves over time, and in particular, how more recent state presence influences contemporary financial development.

As displayed in Fig. 1, state antiquity is significant and pervasive around the world. The global mean of state antiquity up to 1950 AD is 0.469. State experience accumulated in Asia and Europe over the last two millennia is almost double that of Africa and America. These are also the regions which have the highest levels of financial development around the world. Moreover, experienced states ($STATE > 0.8$) such as Austria, France, Japan, South Korea, Portugal and Switzerland all have highly developed financial systems whereas Argentina, the Central African Republic, Jamaica, Kenya, Papua New Guinea and Zambia, which all lacked a state before 1500 AD, tend to have underdeveloped financial systems.

4. Empirical estimates

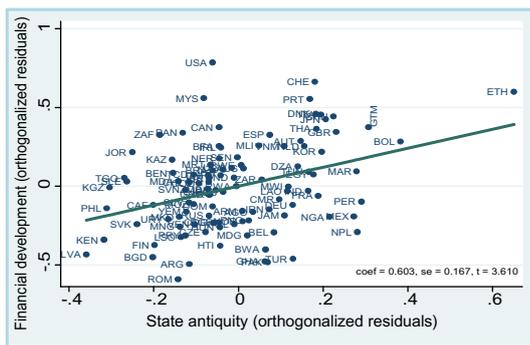
Fig. 2 shows the partial regression line for the effect of the measure of state antiquity on financial development, while controlling for the influence of all other potential determinants discussed earlier. As is evident, the partial regression line shows that the length of state history is a robust predictor of current performance in financial development. This positive correlation is in line with the interpretation that a longer state history predicts a more developed financial system today and is consistent with our regression results below.

Table 1 presents our basic findings for the effects of state antiquity on financial development. We first regress financial development on state antiquity without controlling for any other effects (column (1)). Control variables capturing various competing theoretical views on the determinants of financial development, as discussed in Section 1, are then sequentially added to the regressions in columns (2–5). Column (6) adds continent dummies to ensure that the estimates are not influenced by some heterogeneous effects specific to each region not captured by any of the other explanatory variables. This approach of adding the group of regressors sequentially is to ensure that the results are not driven by potentially high correlations between the control variables. State antiquity, along with all control variables, are jointly considered



Notes: the above show STATE data for only the 107 countries used in the regressions.

Fig. 1. Distribution of state antiquity for 107 countries.



Notes: the scatter plots illustrate the effect of state antiquity on financial development while partialing out the influences of all other control variables listed in Table 1. The partial regression line is based on the regression of column (7) in Table 1.

Fig. 2. Partial effect of state antiquity on financial development.

in the last column. First, consider the univariate regression in column (1). Here, state antiquity enters the regression significantly at the 1% level. A switch from zero to a full state history of one is associated with 0.706 units of improvement in private credit as a ratio of GDP.

Column (2) includes creditor rights, the length of contract enforcement and information sharing as control variables. The control variables in column (2) are replaced with legal origin variables in column (3). The legal tradition of company law or the commercial code for each country is classified into English, French, German or Scandinavian using dummy variables. Controlling for these legal factors provides a check for the robustness of state antiquity as a determinant for financial development after allowing for the influential law and finance theory of La Porta et al. (1997, 1998). The results show that while legal origins are important determinants of financial development, consistent with the proposition of La Porta et al. (1997, 1998), state antiquity remains highly influential. Its coefficient is still very precisely estimated at the 1% significance level.

Column (4) includes only religious composition as the control to capture the influence of culture and trust on financial development (see Stulz and Williamson, 2003). Religious composition is measured as the proportion of the population that practices Catholic,

Islam or other religions, with Protestants as the omitted group, in each country. Allowing for the effects of trust and culture in the regression is important since they may be strongly correlated with both statehood and financial development. If state antiquity affects financial development only through influencing culture and trust, then including religious composition in the regressions would render the effect of statehood insignificant. The results are consistent with the view that countries which are dominated by Catholics and Muslims tend to be associated with lower levels of financial development – a result that confirms the proposition of Stulz and Williamson (2003). Importantly, the coefficient of state antiquity remains statistically highly significant, suggesting that statehood has an independent effect on financial development that does not work through the channel of culture or trust.

Turning to the role of geography, column (5) includes absolute latitude, island, landlockedness and tropical dummies to capture the influence of geographic endowments on financial development. The widely used settler mortality rates data of Acemoglu et al. (2001) are not used here since Albouy (2012) has detected that their data are subject to a number of severe measurement issues. It is apparent that our previous findings regarding the significant effect of state antiquity prevail. Including only continent dummies as the controls in column (6) does not change the qualitative aspect of the results.

Finally, in column (7) all control variables along with state antiquity are added together to account for their joint influence on financial development. The results are consistent with those of the previous columns demonstrating that financial development can be explained by credit power and information sharing, legal traditions, religions, and to a lesser extent, geographic endowments. Most importantly, state antiquity continues to have a strong explanatory power in accounting for the variation in the levels of financial development. Its coefficient is positive and highly significant at the 1% level. The results indicate that a complete change from zero to full state antiquity of one over the last two millennia, *ceteris paribus*, is correlated with an improvement in financial development by 60% of GDP.

To illustrate the results, consider an increase in the value of the state antiquity index of 0.4. Such an increase in the length of state

Table 1
State antiquity and financial development – core results.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
STATE	0.706^{***} (0.175)	0.481^{***} (0.153)	0.688^{***} (0.174)	0.958^{***} (0.160)	0.334^{**} (0.165)	0.600^{***} (0.205)	0.603^{***} (0.167)
Creditor rights		0.451 ^{***} (0.128)					0.134 (0.113)
Contract enforcement days		−0.941 ^{***} (0.219)					−0.587 ^{***} (0.196)
Information sharing		0.385 ^{***} (0.097)					0.332 ^{***} (0.083)
French origin			−0.344 ^{***} (0.096)				−0.201 ^{**} (0.086)
German origin			−0.088 (0.140)				−0.307 ^{**} (0.118)
Scandinavian origin			0.304 (0.218)				−0.695 ^{***} (0.257)
Catholic				−0.685 ^{***} (0.193)			−0.541 [*] (0.275)
Muslim				−1.104 ^{**} (0.193)			−0.950 ^{***} (0.258)
Other religions				−0.809 ^{***} (0.203)			−0.775 ^{***} (0.258)
Latitude					0.991 ^{***} (0.329)		0.599 (0.392)
Island					0.204 (0.157)		−0.058 (0.146)
Landlocked					−0.256 ^{***} (0.082)		−0.178 ^{**} (0.072)
Tropical					−0.078 (0.129)		−0.174 (0.114)
America dummy						0.277 ^{**} (0.109)	−0.007 (0.122)
Asia dummy						0.115 (0.121)	0.036 (0.104)
Europe dummy						0.479 ^{***} (0.114)	−0.019 (0.155)
Oceania dummy						0.779 ^{**} (0.240)	0.063 (0.209)
Intercept	0.163 [*] (0.092)	0.015 (0.136)	0.375 ^{***} (0.102)	0.765 ^{***} (0.168)	0.121 (0.173)	−0.013 (0.099)	0.794 ^{***} (0.265)
R-squared	0.134	0.393	0.288	0.356	0.411	0.336	0.685
No. of obs.	107	107	107	107	107	107	107

Notes: figures in the parentheses indicate standard errors.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

experience, which is roughly equal to the gap in value between India and Madagascar, is associated with an increase in financial development of 24% of GDP. For countries such as Israel, Mali, Romania, Russia and Senegal whose state antiquity is around the mean value of 0.47, the estimated effect on financial development is around 28% of GDP. States such as France, Japan and Switzerland, which have accumulated significant experience over the last two millennia are able to create substantially more sophisticated financial systems whereas those with low levels of state experience, including the Central African Republic, Kenya and Papua New Guinea, have generated little improvement in financial development.

5. Robustness of results

This section carries out several robustness checks for the results. Column (7) in Table 1 is used as the benchmark model for the purpose of comparison. Consequently, the estimations henceforth include all control variables used in the benchmark model.

5.1. Endogeneity

Our analyses thus far have assumed that state antiquity is exogenous. However, we cannot rule out the possibility that the causal-ity between contemporary financial development and state

antiquity since 1 AD may run in the opposite direction since the initial endowments of finance in the economy may affect subsequent state development. To the extent that current financial development is influenced by its initial endowments, the effect of statehood on finance we found earlier does not identify the channel of influence. Moreover, their association may be spurious due to the failure to account for an unobserved channel which is related to both variables, and the estimated length of state experience may also be subject to some measurement errors, all of which will violate the standard OLS assumptions.

We use several instruments to obtain the exogenous sources of variation for state antiquity in order to estimate its causal effect on current financial development. The first instrument we employ is the overall technology adoption rate in 1 AD using the data from Comin et al. (2010). The adoption of technology in the early stages is crucial for state development. Roberts (1956) and Tilly (1992) emphasize that technological discovery in the methods of warfare and weapon systems was one of the key drivers giving rise to the formation of states in ancient societies, due to the need for a larger army that required centralized states to provide adequate logistic, financial and administrative support. Moreover, the invention and adoption of better farming techniques following the Neolithic transition also significantly improved agricultural productivity which allowed polities to enhance their fiscal capacity through raising

more tax revenues. States may also arise following technological innovations in communications and transportation. In this connection, the use of the overall technology adoption index of Comin et al. (2010) is ideal as it captures the overall state of technological development in an economy covering the agriculture, transportation, communications, industry and military sectors.

The second instrument employed is geographical distance from the regional frontier. Geographical barriers or isolation can hinder state development through imposing high costs of international trade, reducing economic interaction, and slowing down the adoption and adaptation of technologies created at the frontiers (McNeill, 1982; Keller, 2002). In contrast, geographical proximity to the frontier provides greater opportunity to trade, increases the intensity of economic interaction, and facilitates the diffusion of ideas across borders. Geographical distance to the regional frontier for a particular country is measured by its 'Haversine' distance from one of its two frontiers in the same continent, where the frontiers are identified as the two countries having the highest population density in that continent in 1 AD. The 'Haversine' formula provides the shortest distance between two points on the surface of a sphere from their longitudes and latitudes. Greece and Italy, for instance, are chosen as the frontiers for Europe in 1 AD in our sample.

Finally, we also use genetic distance from the global frontier as an instrument. It is defined as the degree of hereditary dissimilarities or historical unrelatedness for a particular country relative to the technological frontier in 1 AD, i.e., Italy. The fixation index (F_{ST}) genetic distance data as of 1500 AD from Spolaore and Wacziarg (2009) are used. While ideally we would like to use the data for 1 AD, the matching of populations to countries is not possible since the composition of populations in 1 AD for all countries are not known. Our approach therefore implicitly assumes that the composition of population in 1 AD for the large majority of countries was not significantly different from that in 1500 AD. This is a plausible assumption given that movements of people across borders due to voluntary migration, slavery and colonialism were fairly limited during the pre-colonial era. Consequently, the unobserved genetic distance in prehistory is likely to be highly correlated with the observed relative genetic distance as of 1500 AD. Greater genetic distance from the global frontier serves as a developmental barrier that prevents the occurrence of population admixing due to higher differences in cultures, faiths, customs, habits, etc., thus hampering effective diffusion of state experience across borders. This therefore reduces the state's capacity to rule and deploy citizens in servicing the state, which will retard its consolidation and development.

Under the assumption that these instruments do not affect financial development directly, other than through state antiquity, conditional on the controls included in the regressions, these exclusion restrictions are an appropriate strategy for identifying the channel of influence. The IV-2SLS regressions reported in Table 2 examine the importance of state antiquity on financial development by considering the potential endogeneity nature of their relationship. The instruments are first used one at a time and then jointly in the last regression. We report both the first and second-stage regression results. The coefficients of technology adoption, distance to the regional frontier and genetic distance to the global frontier are, individually and jointly, significant and have the expected signs in the first-stage regressions (columns (1a), (2a), (3a) and (4a)). Importantly, while its coefficients obtained here are larger in most cases, state antiquity is still positive and significant in all regressions. In econometric terms, we are confident that technology adoption, distance to the regional frontier and genetic distance are not weak instruments, as confirmed by the first-stage F -statistics for the exogenous instruments. The over-identification test also suggests that they are valid instruments (column (4b)). Since the tests of endogeneity suggest that in all cases state anti-

quity appears to be exogenous, we maintain the use of OLS in subsequent analyses as it is more efficient than IV-2SLS.

5.2. Alternative lengths or periods of state experience accumulated

This subsection provides a check of whether the effect of state antiquity on financial development persists over time and whether the length of state experience matters. It is evident from the results reported in Table 3 that our previous findings regarding the role of state antiquity prevail across different measures of state development. Specifically, Column (1) examines how the accumulation of the first 500 years of state experience affects contemporary financial development. Column (2) adds another 500 years of state experience in the calculation and column (3) considers state presence in the first 15 centuries since 1 AD. In all cases, statehood is found to have a significant positive impact on current financial development. The magnitude of the coefficients increases as more experience is accumulated, suggesting that the relationship between finance and state is a positive function of the length of statehood.

Columns (4–6) consider how the post-1500 state presence affects current ratios of private credit. The consideration of more recent periods of state history is useful to ensure that our measure of *STATE* is not proxying the effects of other early historical development such as agricultural progress, as emphasized by Diamond (1997). We will address this issue more formally in Section 5.7. Moreover, focusing on state history since 1500 AD provides information that is likely to be more predictive of current financial development. The year 1500 AD is chosen as the cut-off point since several important historical events such as the European expansion, colonization, and global migration have occurred since then. There is clear evidence suggesting that more recent state history, especially state experience accumulated over the last two centuries, is more strongly associated with current financial development. Similar results are obtained when we include $STATE_{1-1500}$ as a measure of initial state conditions in these regressions (not reported). Overall, the results here suggest that the length of state history matters for financial development and more recent state development is associated with higher levels of financial development.

5.3. Individual components of state history

This sub-section carries out some additional analyses by considering the individual components of the aggregate state history index. The overall index of state history considered so far is based on three different components, which capture the presence of a government above the tribal level ($ST^{PRESENCE}$), whether this government is foreign or locally based ($ST^{AUTONOMY}$), and the proportion of the current territory covered by this government ($ST^{COVERAGE}$). It would be intriguing to shed some further light on how these individual components are related to financial development.

The results presented in Table 4 show that all individual components of state history are effective in shaping financial development, and these effects are found to be statistically significant at the 1% level. The size of their coefficients (ranging from 0.440 to 0.494), however, is smaller than that of the aggregate index (0.603). This evidence suggests that these dimensions of state development are jointly more powerful in explaining the variation in financial development across the world than individually, and therefore using the aggregate index is more appropriate.

Additionally, while $ST^{COVERAGE}$ is associated with the largest coefficient, the effect of $ST^{AUTONOMY}$ is more precisely estimated. The next three columns perform a horse race exercise to pin down the most influential component of *STATE*, noting that these individual components are highly correlated, with correlation coefficients

Table 2
IV-2SLS regressions.

Dep. var. =	(1a) 1st-stage STATE	(1b) 2nd-stage Fin. dev.	(2a) 1st-stage STATE	(2b) 2nd-stage Fin. dev.	(3a) 1st-stage STATE	(3b) 2nd-stage Fin. dev.	(4a) 1st-stage STATE	(4b) 2nd-stage Fin. dev.
STATE		1.086*** (0.394)		0.526** (0.253)		0.660** (0.261)		0.681*** (0.219)
Technology adoption 1 AD	0.415*** (0.117)						0.214* (0.123)	
Geographical distance to the frontier 1 AD			-0.071*** (0.018)				-0.034* (0.020)	
Genetic distance to the global frontier 1 AD					-2.257*** (0.506)		-1.699*** (0.485)	
Creditor rights	0.013 (0.068)	0.118 (0.126)	0.081 (0.068)	0.141 (0.114)	0.035 (0.065)	0.136 (0.116)	0.050 (0.066)	0.135 (0.116)
Contract enforcement days	-0.144 (0.117)	-0.491*** (0.170)	-0.197* (0.114)	-0.604*** (0.180)	-0.152 (0.112)	-0.579*** (0.170)	-0.133 (0.110)	-0.575*** (0.168)
Information sharing	0.079 (0.049)	0.296*** (0.083)	0.078 (0.049)	0.339*** (0.063)	0.098** (0.048)	0.328*** (0.065)	0.096** (0.046)	0.326*** (0.065)
French origin	0.012 (0.052)	-0.220** (0.098)	-0.001 (0.052)	-0.202** (0.091)	0.028 (0.049)	-0.207** (0.093)	-0.005 (0.049)	-0.208** (0.093)
German origin	0.123* (0.069)	-0.366*** (0.115)	0.022 (0.073)	-0.295** (0.120)	0.147** (0.067)	-0.317*** (0.117)	0.105 (0.073)	-0.321*** (0.115)
Scandinavian origin	0.104 (0.154)	-0.764*** (0.290)	0.085 (0.152)	-0.659** (0.296)	0.086 (0.149)	-0.704** (0.291)	0.100 (0.142)	-0.712** (0.289)
Catholic	0.171 (0.164)	-0.629* (0.323)	0.140 (0.162)	-0.491 (0.324)	0.060 (0.160)	-0.546* (0.320)	0.119 (0.153)	-0.554* (0.317)
Muslim	0.225 (0.153)	-1.097*** (0.298)	0.129 (0.156)	-0.891*** (0.303)	0.008 (0.161)	-0.966*** (0.299)	0.017 (0.155)	-0.978*** (0.290)
Other religions	0.202 (0.154)	-0.850*** (0.281)	0.068 (0.153)	-0.718** (0.283)	0.012 (0.152)	-0.779*** (0.281)	0.102 (0.144)	-0.788*** (0.275)
Latitude	-0.227 (0.234)	0.685* (0.407)	0.063 (0.239)	0.613* (0.352)	-0.167 (0.226)	0.619* (0.351)	-0.046 (0.231)	0.620* (0.353)
Island	-0.049 (0.087)	-0.032 (0.136)	0.022 (0.088)	-0.050 (0.119)	-0.096 (0.085)	-0.037 (0.122)	-0.054 (0.086)	-0.035 (0.122)
Landlocked	-0.035 (0.043)	-0.167*** (0.062)	-0.032 (0.043)	-0.184*** (0.058)	0.012 (0.043)	-0.179*** (0.060)	-0.010 (0.042)	-0.179*** (0.059)
Tropical	-0.093 (0.068)	-0.141 (0.105)	-0.019 (0.068)	-0.188* (0.098)	0.022 (0.069)	-0.177* (0.095)	0.007 (0.069)	-0.175* (0.096)
Intercept	-0.055 (0.175)	0.689** (0.296)	0.469*** (0.168)	0.797*** (0.255)	0.678*** (0.183)	0.794*** (0.253)	0.501** (0.210)	0.793*** (0.253)
R-squared	0.581	0.655	0.592	0.683	0.609	0.684	0.629	0.683
No. of obs.	107	107	107	107	107	107	107	107
Continent dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Endogeneity (<i>p</i> -value)		0.236		0.697		0.861		0.734
Over-identification (<i>p</i> -value)								0.338

Notes: figures in the parentheses indicate standard errors.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

ranging between 0.82 and 0.95. The evidence unequivocally suggests that, statistically, $STATE^{AUTONOMY}$ matters most for financial development. This finding therefore suggests that the autonomy that a state enjoys matters much more than its territorial influence.

5.4. Alternative measures of financial development

Our indicator of financial development has thus far been measured only using the ratio of private credit to GDP, averaged over the period 2000–2009. The private credit ratio is our preferred measure of financial development since it is most widely used in the literature (Ang, 2008). However, to ensure that our results are not driven by the way financial development is measured, we consider the following strategies. First, the average private credit ratio (PCY) over the last five decades (1960–2009) is considered to examine if state history is less important for financial development in the current decade compared to the previous decades. Next, liquid liabilities over GDP (LLY), deposit money bank assets over GDP (DBY), stock market total value traded over GDP (STRAD), stock market capitalization over GDP (SCAP) and the stock market

turnover ratio (STURN or STRAD/SCAP) are used as alternative indicators of financial development. This allows us to check if state history affects each type of financial structure (bank-based or market-based) differently. All these measures are averaged over the period 2000–2009. The stock market-based variables are, however, only available for 81 countries in our sample. Finally, using the method of principal component analysis, the first principal component (1st PC) of our benchmark financial development indicator, LLY, DBY, STRAD, SCAP and STURN is used to provide an overall measure capturing different aspects of financial development (see Ang and McKibbin, 2007 for this approach). The first principal component extracted is found to be significantly and positively correlated with all six financial development indicators with correlation coefficients ranging from 0.69 to 0.92, thus suggesting that it is a reliable measure of overall financial development.

It is immediately clear from the results reported in Table 5 that the coefficients of state antiquity are significant and carry the right sign in all regressions. The much smaller coefficient of STATE obtained in column (1) suggests that state history has stronger explanatory power for current financial development than

Table 3
Alternative lengths or periods of state experience accumulated.

	(1)	(2)	(3)	(4)	(5)	(6)
<i>STATE</i> _{1–500}	0.382*** (0.116)					
<i>STATE</i> _{1–1000}		0.412*** (0.118)				
<i>STATE</i> _{1–1500}			0.417*** (0.134)			
<i>STATE</i> _{1501–1950}				0.490*** (0.168)		
<i>STATE</i> _{1651–1950}					0.585*** (0.169)	
<i>STATE</i> _{1801–1950}						1.131*** (0.327)
Creditor rights	0.138 (0.115)	0.133 (0.114)	0.142 (0.115)	0.135 (0.116)	0.133 (0.114)	0.133 (0.114)
Contract enforcement days	–0.768*** (0.196)	–0.691*** (0.194)	–0.653*** (0.197)	–0.561*** (0.204)	–0.525** (0.201)	–0.513** (0.202)
Information sharing	0.378*** (0.083)	0.354*** (0.083)	0.340*** (0.084)	0.352*** (0.085)	0.340*** (0.083)	0.317*** (0.084)
French origin	–0.203** (0.087)	–0.194** (0.086)	–0.179** (0.087)	–0.219** (0.089)	–0.222** (0.087)	–0.209** (0.086)
German origin	–0.245** (0.117)	–0.243** (0.116)	–0.288** (0.119)	–0.288** (0.120)	–0.277** (0.117)	–0.234** (0.116)
Scandinavian origin	–0.504* (0.261)	–0.499* (0.259)	–0.620* (0.261)	–0.757*** (0.267)	–0.779*** (0.262)	–0.805*** (0.264)
Catholic	–0.433 (0.276)	–0.435 (0.275)	–0.483* (0.279)	–0.561* (0.283)	–0.591** (0.279)	–0.625** (0.281)
Muslim	–0.828*** (0.257)	–0.829*** (0.255)	–0.924*** (0.263)	–0.866*** (0.262)	–0.879*** (0.257)	–0.868*** (0.257)
Other religions	–0.657** (0.259)	–0.672** (0.258)	–0.741*** (0.262)	–0.766*** (0.264)	–0.792*** (0.260)	–0.818*** (0.261)
Latitude	0.576 (0.396)	0.603 (0.394)	0.598 (0.399)	0.526 (0.401)	0.530 (0.394)	0.520 (0.394)
Island	–0.077 (0.148)	–0.066 (0.147)	–0.044 (0.149)	–0.104 (0.149)	–0.105 (0.147)	–0.107 (0.147)
Landlocked	–0.156** (0.074)	–0.168** (0.073)	–0.183** (0.074)	–0.178** (0.074)	–0.170** (0.073)	–0.180** (0.073)
Tropical	–0.156 (0.116)	–0.156 (0.115)	–0.175 (0.116)	–0.203* (0.116)	–0.176 (0.114)	–0.145 (0.116)
Intercept	0.868*** (0.266)	0.852*** (0.264)	0.884*** (0.267)	0.738*** (0.276)	0.670** (0.274)	0.644** (0.276)
R-squared	0.678	0.682	0.674	0.670	0.681	0.681
No. of obs.	107	107	107	107	107	107
Continent dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: figures in the parentheses indicate standard errors.

- * Significance at the 10% level.
- ** Significance at the 5% level.
- *** Significance at the 1% level.

financial development over the last half century. Results in columns (2) to (6) suggest that state history positively affects both bank-based and market-based financial systems and there is no systematic difference between them. Column (7) shows that the results are consistent when the summary measure of financial development is used. Column (8) reproduces our benchmark results in Table 1 for reference and column (9) reruns this regression using only 81 countries for which the stock market data are available. As the magnitude of the coefficients of *STATE* change only marginally, our results are unlikely to be driven by countries excluded in the estimations.

To facilitate comparison of the effect of state history on different measures of financial development, the beta coefficients of *STATE* (indicated in square brackets) are reported below their unstandardized counterparts. These are coefficients obtained from regressions carried out on variables that have been standardized to have a mean of 0 and a standard deviation of 1. These estimates suggest that the economic impact of *STATE* is largest when financial development is measured using a summary measure of all six indicators, where a one standard deviation improvement in

state presence in the history is correlated with 0.46 units of standard deviation improvement in overall financial development. Such a finding is not surprising since the summary measure captures more dimensions of development in the financial system, and is therefore a more complete measure of financial development.

5.5. Controlling for other effects

State antiquity could potentially improve financial development through enhancing state stability and capacity. Controlling for these factors is important given that if statehood matters for financial development due to their influence then we may find only a weak or no relationship between state antiquity and finance. Column (1) in Table 6 includes state stability as an additional regressor. Columns (2) and (3) use indices of corruption controls and government effectiveness, respectively, to capture the effects of state capacity. While the inclusion of state stability does not alter our main findings, it is interesting to observe that the coefficients of state history fall when corruption controls and government

Table 4
Individual components of state history.

Dep. var. = financial development	(1)	(2)	(3)	(4)	(5)	(6)
PRESENCE of STATE	0.440*** (0.152)			-0.069 (0.308)		-0.613 (0.619)
AUTONOMY of STATE		0.455*** (0.139)		0.510* (0.295)	0.379** (0.176)	0.650* (0.349)
COVERAGE of STATE			0.494*** (0.164)		0.133 (0.198)	0.517 (0.423)
Creditor rights	0.141 (0.127)	0.150 (0.126)	0.128 (0.125)	0.152 (0.126)	0.144 (0.127)	0.140 (0.126)
Contract enforcement days	-0.670*** (0.204)	-0.621*** (0.190)	-0.655*** (0.209)	-0.616*** (0.195)	-0.621*** (0.192)	-0.582*** (0.197)
Information sharing	0.347*** (0.072)	0.333*** (0.071)	0.354*** (0.071)	0.333*** (0.071)	0.334*** (0.070)	0.332*** (0.070)
French origin	-0.202** (0.101)	-0.192* (0.102)	-0.198* (0.100)	-0.189* (0.103)	-0.195* (0.101)	-0.186* (0.104)
German origin	-0.254* (0.135)	-0.273** (0.132)	-0.275** (0.134)	-0.274** (0.133)	-0.277** (0.131)	-0.304** (0.131)
Scandinavian origin	-0.602* (0.336)	-0.622* (0.320)	-0.675** (0.339)	-0.625* (0.321)	-0.638* (0.324)	-0.706** (0.324)
Catholic	-0.500 (0.335)	-0.499 (0.332)	-0.551 (0.336)	-0.497 (0.333)	-0.520 (0.334)	-0.557* (0.334)
Muslim	-0.963*** (0.290)	-0.903*** (0.280)	-1.007*** (0.295)	-0.889*** (0.291)	-0.945*** (0.290)	-0.938*** (0.291)
Other religions	-0.772** (0.295)	-0.746** (0.292)	-0.805*** (0.296)	-0.739** (0.295)	-0.768** (0.295)	-0.777** (0.295)
Latitude	0.516 (0.413)	0.484 (0.414)	0.632 (0.415)	0.480 (0.416)	0.523 (0.419)	0.594 (0.430)
Island	-0.059 (0.143)	-0.051 (0.134)	-0.076 (0.152)	-0.051 (0.134)	-0.054 (0.138)	-0.063 (0.140)
Landlocked	-0.181*** (0.068)	-0.177*** (0.067)	-0.189*** (0.067)	-0.177*** (0.067)	-0.179*** (0.067)	-0.182*** (0.066)
Tropical	-0.213** (0.107)	-0.228** (0.107)	-0.160 (0.110)	-0.230** (0.110)	-0.211* (0.115)	-0.178 (0.114)
Intercept	0.821** (0.318)	0.820** (0.315)	0.818** (0.320)	0.824** (0.316)	0.809** (0.318)	0.808** (0.318)
R-squared	0.667	0.677	0.665	0.677	0.677	0.681
No. of obs.	107	107	107	107	107	107
Continent dummies	Yes	Yes	Yes	Yes	Yes	Yes

Notes: PRESENCE of STATE is measured as: $(\sum_{t=1}^{39} (1.05)^{1-t} \cdot ST_t^{PRESENCE} \cdot 50) / (\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50)$ and so on. $ST_t^{PRESENCE}$ captures the presence of a government above the tribal level; $ST_t^{AUTONOMY}$ reflects whether this government is foreign or locally based; and $ST_t^{COVERAGE}$ measures the proportion of the current territory covered by this government. STATE used in previous tables is given as: $(\sum_{t=1}^{39} (1.05)^{1-t} \cdot SA_t) / (\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50)$ where $SA_t = ST_t^{PRESENCE} \times ST_t^{AUTONOMY} \times ST_t^{COVERAGE} \times 50$. Figures in the parentheses indicate standard errors.

* Significance at the 10% level.
** Significance at the 5% level.
*** Significance at the 1% level.

effectiveness are included, suggesting that state history may improve financial development via enhancing state capacity. This is broadly in line with the findings of Ang (2013) that state antiquity is an important determinant of the quality of institutions. Hence, in addition to its direct role, the influence of statehood on financial development may in part operate through its effects on state capacity. The next sub-section investigates this issue further.

Apart from the factors that have been controlled for in our previous regressions, political stability, income growth and levels, openness to international trade, financial openness, ethnic fractionalization and government ownership of banks have also been identified in the literature as being important determinants for financial development (see, e.g., La Porta et al., 2002; Beck et al., 2003; Rajan and Zingales, 2003; Andrianova et al., 2008; Roe and Siegel, 2011). The potential influence of reverse causality bias is minimized by averaging income growth over the preceding decade (1990–1999) and using the initial year (2000) for all other variables. While we find that these variables are significant in some cases, their inclusion in the regression generally does not alter our key findings (see columns (4–10)). The smaller coefficients on statehood obtained in columns (5) and (6) reflect the fact that statehood also has an indirect, but relatively immaterial, effect on financial development that works through both income growth and income levels, respectively.

5.6. Testing the mediation effects of corruption control and government effectiveness

This subsection performs a more thorough investigation on the mediating effect of control for corruption and government effectiveness on financial development. The approach considered here involves estimation of two regression equations, as illustrated in Fig. 3 using corruption control as an example. First, the parameter (b_1) describing the effect of state history (STATE) on the mediator, i.e., corruption control (CC) is estimated (Model 1). Next, the direct effect is estimated by regressing financial development (FinDev) on state history (STATE) while controlling for the mediator (Model 2). The coefficient of state history provides the magnitude of this effect (b_2). The indirect effect is given by the product of b_1 and b_3 , where b_3 measures the strength of the correlation between FinDev and CC in Model 2. This term also reflects the size of the mediation, which essentially depends upon the extent to which STATE influences the mediator (b_1) and the extent to which the mediator affects FinDev (b_3).

The estimation results for regressing these models are reported in Table 7. Columns (1a) and (2a) report the results of estimating Model (1) using control for corruption and government effectiveness as the mediator, respectively. The regression results for Model 2 using these mediators are reported in columns (1b) and

Table 5
Alternative measures of financial development.

	(1) PCY ₉₀₋₉₉	(2) LLY	(3) DBY	(4) STRAD	(5) SCAP	(6) STURN	(7) 1st PC	(8) PCY ^{baseline} (full sample)	(9) PCY ^{baseline} (restricted sample)
STATE	0.338*** (0.113)	0.592*** (0.140)	0.800*** (0.160)	1.018*** (0.340)	0.489* (0.257)	1.114*** (0.364)	0.824*** (0.185)	0.603*** (0.167)	0.610*** (0.214)
STATE beta coeff.	[27.9%]	[39.9%]	[41.5%]	[36.1%]	[24.5%]	[41.2%]	[46.0%]	[30.6%]	[31.0%]
Creditor rights	0.016 (0.077)	0.090 (0.095)	0.162 (0.109)	-0.164 (0.250)	-0.182 (0.189)	0.123 (0.268)	0.068 (0.136)	0.134 (0.113)	0.229 (0.144)
Contract enforcement days	-0.355*** (0.133)	-0.358** (0.164)	-0.599*** (0.188)	-0.240 (0.402)	-0.275 (0.304)	0.288 (0.430)	-0.301 (0.218)	-0.587*** (0.196)	-0.536** (0.233)
Information sharing	0.176*** (0.056)	0.148** (0.070)	0.230*** (0.080)	0.224 (0.198)	0.093 (0.150)	0.065 (0.212)	0.187 (0.107)	0.332*** (0.083)	0.316*** (0.115)
French origin	-0.076 (0.058)	-0.136* (0.072)	-0.153* (0.082)	-0.090 (0.191)	-0.179 (0.144)	-0.048 (0.205)	-0.118 (0.104)	-0.201** (0.086)	-0.165 (0.110)
German origin	0.030 (0.080)	-0.029 (0.098)	-0.178 (0.113)	-0.312 (0.228)	-0.292* (0.173)	-0.311 (0.245)	-0.244* (0.124)	-0.307** (0.118)	-0.346** (0.132)
Scandinavian origin	-0.295* (0.174)	-0.482** (0.216)	-0.372 (0.247)	-1.250** (0.486)	-0.901** (0.367)	-0.639 (0.520)	-0.760** (0.264)	-0.695*** (0.257)	-0.920*** (0.295)
Catholic	-0.360* (0.186)	-0.108 (0.230)	-0.124 (0.264)	-2.028*** (0.576)	-1.244*** (0.435)	-1.187* (0.617)	-0.893*** (0.313)	-0.541* (0.275)	-0.778** (0.345)
Muslim	-0.529*** (0.175)	-0.262 (0.216)	-0.585** (0.248)	-2.637*** (0.615)	-1.499*** (0.465)	-1.203* (0.659)	-1.352*** (0.334)	-0.950*** (0.258)	-1.521*** (0.377)
Other religions	-0.461*** (0.175)	-0.188 (0.216)	-0.459* (0.247)	-2.132*** (0.539)	-1.271*** (0.408)	-1.208** (0.578)	-1.071*** (0.293)	-0.775*** (0.258)	-1.172*** (0.339)
Latitude	0.193 (0.266)	0.039 (0.329)	0.334 (0.376)	-0.093 (0.881)	-0.213 (0.666)	-0.113 (0.944)	0.124 (0.479)	0.599 (0.392)	0.473 (0.514)
Island	0.050 (0.099)	0.239 (0.122)	0.110 (0.140)	-0.136 (0.282)	0.108 (0.213)	0.089 (0.302)	0.092 (0.153)	-0.058 (0.146)	-0.030 (0.175)
Landlocked	-0.124** (0.049)	-0.142** (0.061)	-0.196*** (0.069)	-0.174 (0.166)	-0.221* (0.125)	-0.075 (0.177)	-0.195** (0.090)	-0.178** (0.072)	-0.242** (0.096)
Tropical	-0.118 (0.077)	-0.141 (0.095)	-0.136 (0.109)	-0.604** (0.289)	-0.363 (0.219)	-0.541* (0.310)	-0.344** (0.157)	-0.174 (0.114)	-0.309* (0.171)
Intercept	0.582*** (0.179)	0.464** (0.222)	0.499* (0.254)	2.225*** (0.640)	1.839*** (0.483)	1.186* (0.685)	1.214*** (0.347)	0.794*** (0.265)	1.156*** (0.402)
R ²	0.625	0.609	0.707	0.504	0.433	0.380	0.637	0.685	0.673
N	107	107	107	81	81	81	81	107	81
Continent dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: figures in the parentheses indicate standard errors.

- * Significance at the 10% level.
- ** Significance at the 5% level.
- *** Significance at the 1% level.

Table 6
Controlling for other effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
<i>STATE</i>	0.58*** (0.16)	0.42*** (0.15)	0.40** (0.15)	0.62*** (0.15)	0.52*** (0.18)	0.50*** (0.16)	0.63*** (0.17)	0.56*** (0.16)	0.62*** (0.17)	0.59*** (0.21)
State stability	0.01*** (0.00)									
Control for corruption		0.01*** (0.00)								
Government effectiveness			0.01*** (0.00)							
Political stability				0.01*** (0.00)						
Income growth					0.02 (0.01)					
Income levels						0.00*** (0.00)				
Trade openness							0.00 (0.00)			
Financial openness								0.07*** (0.02)		
Ethnic fractionalization									0.09 (0.16)	
State ownership of banks										-0.01*** (0.00)
Creditor rights	0.11 (0.11)	0.12 (0.10)	0.10 (0.10)	0.13 (0.10)	0.14 (0.11)	0.21** (0.11)	0.12 (0.12)	0.15 (0.11)	0.13 (0.11)	0.03 (0.13)
Contract enforcement days	-0.41** (0.19)	-0.37** (0.18)	-0.30 (0.18)	-0.41** (0.19)	-0.56*** (0.20)	-0.59*** (0.18)	-0.57*** (0.20)	-0.45** (0.19)	-0.61*** (0.20)	-0.35 (0.21)
Information sharing	0.24*** (0.08)	0.18** (0.08)	0.20** (0.08)	0.25*** (0.08)	0.29*** (0.09)	0.32*** (0.08)	0.33*** (0.08)	0.33*** (0.08)	0.33*** (0.08)	0.24* (0.13)
French origin	-0.17** (0.08)	-0.10 (0.08)	-0.07 (0.08)	-0.17** (0.08)	-0.16* (0.09)	-0.16* (0.08)	-0.20* (0.09)	-0.15* (0.08)	-0.20* (0.09)	-0.15 (0.11)
German origin	-0.32*** (0.11)	-0.23** (0.11)	-0.23** (0.10)	-0.37*** (0.11)	-0.27** (0.12)	-0.29*** (0.11)	-0.31** (0.12)	-0.18 (0.12)	-0.30** (0.12)	-0.24 (0.14)
Scandinavian origin	-0.63** (0.25)	-0.69*** (0.23)	-0.66*** (0.23)	-0.79*** (0.24)	-0.71*** (0.26)	-0.40 (0.25)	-0.67** (0.26)	-0.47* (0.25)	-0.66** (0.26)	-0.93*** (0.30)
Catholic	-0.55** (0.26)	-0.59** (0.25)	-0.60** (0.24)	-0.64** (0.26)	-0.59** (0.28)	-0.26 (0.26)	-0.55* (0.28)	-0.50* (0.26)	-0.52* (0.28)	-1.00*** (0.36)
Muslim	-0.86*** (0.25)	-0.85*** (0.23)	-0.83*** (0.23)	-0.88*** (0.24)	-0.96*** (0.26)	-0.68*** (0.25)	-0.95*** (0.26)	-0.75*** (0.25)	-0.94*** (0.26)	-1.51*** (0.37)
Other religions	-0.74*** (0.25)	-0.71*** (0.23)	-0.71*** (0.23)	-0.79*** (0.24)	-0.77*** (0.26)	-0.58** (0.24)	-0.76*** (0.26)	-0.56** (0.25)	-0.76*** (0.26)	-1.15*** (0.35)
Latitude	0.20 (0.39)	0.12 (0.36)	0.06 (0.36)	-0.13 (0.40)	0.58 (0.39)	0.52 (0.36)	0.56 (0.40)	0.34 (0.38)	0.62 (0.39)	0.10 (0.50)
Island	-0.12 (0.14)	-0.19 (0.13)	-0.17 (0.13)	-0.09 (0.14)	-0.03 (0.15)	-0.07 (0.14)	-0.04 (0.15)	-0.03 (0.14)	-0.05 (0.15)	-0.21 (0.24)
Landlocked	-0.15** (0.07)	-0.13** (0.07)	-0.10 (0.07)	-0.16** (0.07)	-0.17** (0.07)	-0.13 (0.07)	-0.18* (0.07)	-0.17* (0.07)	-0.18** (0.07)	-0.17 (0.12)
Tropical	-0.15 (0.11)	-0.13 (0.10)	-0.15 (0.10)	-0.25** (0.11)	-0.19* (0.11)	-0.12 (0.11)	-0.20 (0.12)	-0.22** (0.11)	-0.19 (0.12)	-0.37** (0.16)
Intercept	0.58** (0.26)	0.57** (0.24)	0.51** (0.24)	0.73*** (0.24)	0.81*** (0.26)	0.53** (0.25)	0.76*** (0.27)	0.55** (0.26)	0.73** (0.29)	1.72*** (0.42)
R-squared	0.718	0.752	0.761	0.735	0.690	0.733	0.686	0.721	0.686	0.771
No. of obs.	107	107	107	107	107	107	107	107	107	72
Continent dummies	Yes									

Notes: figures in the parentheses indicate standard errors.

* Significance at the 10% level.

** Significance at the 5% level.

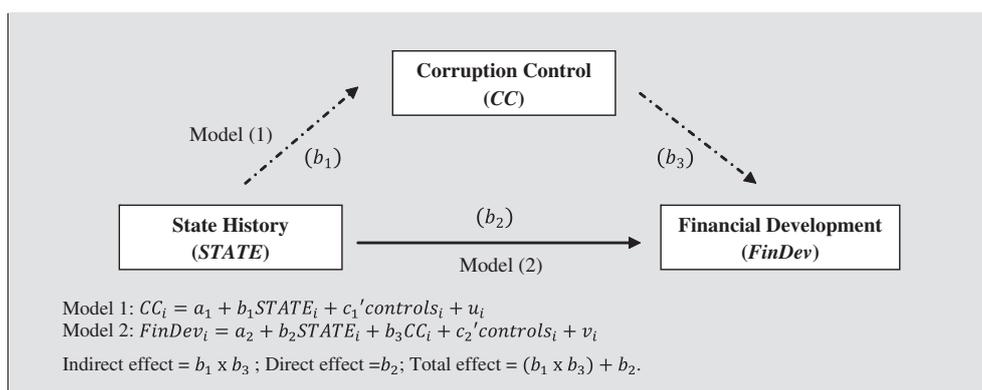
*** Significance at the 1% level.

(2b) accordingly. Note that these regressions are identical to those previously reported in columns (2) and (3) of Table 6, respectively. For convenience, results for the baseline model (the last column in Table 1) are also reproduced in column (3).

On the whole, these regression results suggest that: (1) *STATE* affects both mediators (columns (1a) and (2a)) and these effects are statistically significant at the 5% level; (2) both mediators have a significant separate effect on financial development (columns (1b) and (2b)); (3) *STATE* significantly affects financial development in the absence of any mediators (column (3)); and (4) the effect of *STATE* on financial development diminishes once a mediator is included in the model (columns (1b) and (2b) relative to column (3)). Taken together, these observations suggest that mediation

may have occurred where some influences of *STATE* on financial development are carried through by control for corruption and government effectiveness.

Table 8 provides a formal analysis of the mediation effects based on several statistical approaches popularized by MacKinnon et al. (1995). It considers several mediation tests to investigate if the indirect effect of *STATE* on financial development via influencing control for corruption or government effectiveness is statistically different from zero. These mediated effect estimators differ in terms of how the third term of the variance estimate in the denominator is treated. The Sobel mediation test omits this term, the Aroian version adds it, whereas the Goodman estimator subtracts it (see notes to Table 8 for details).



Source: modified from MacKinnon et al. (1995).

Fig. 3. Modeling the mediation effect of corruption control.

Table 7
The mediation effects of corruption controls and government effectiveness.

Dep. var. =	(1) Mediator = control for corruption		(2) Mediator = government effectiveness		(3) Baseline regression
	(1a) Control for corruption	(1b) Financial development	(2a) Government effectiveness	(2b) Financial development	(3) Financial development
STATE	23.995** (9.984)	0.418*** (0.154)	23.137** (9.125)	0.395** (0.151)	0.603*** (0.167)
Control for corruption		0.008*** (0.002)			
Government effectiveness				0.009*** (0.002)	
Creditor rights	1.318 (6.788)	0.124 (0.101)	3.945 (6.204)	0.098 (0.100)	0.134 (0.113)
Contract enforcement days	-28.691** (11.744)	-0.366** (0.181)	-32.523*** (10.733)	-0.296 (0.181)	-0.587** (0.196)
Information sharing	19.341*** (4.978)	0.183** (0.080)	14.678*** (4.549)	0.201** (0.077)	0.332*** (0.083)
French origin	-13.692*** (5.134)	-0.095 (0.080)	-15.010*** (4.692)	-0.066 (0.079)	-0.201** (0.086)
German origin	-10.095 (7.039)	-0.229** (0.106)	-8.951 (6.433)	-0.227** (0.104)	-0.307** (0.118)
Scandinavian origin	-1.110 (15.411)	-0.686*** (0.230)	-4.313 (14.085)	-0.656*** (0.226)	-0.695*** (0.257)
Catholic	5.950 (16.475)	-0.587** (0.246)	6.770 (15.057)	-0.602** (0.241)	-0.541* (0.275)
Muslim	-13.122 (15.474)	-0.849*** (0.231)	-13.076 (14.142)	-0.833*** (0.228)	-0.950*** (0.258)
Other religions	-7.994 (15.439)	-0.713*** (0.230)	-7.322 (14.111)	-0.709** (0.226)	-0.775** (0.258)
Latitude	62.455*** (23.497)	0.117 (0.364)	60.599*** (21.475)	0.056 (0.359)	0.599 (0.392)
Island	16.656* (8.755)	-0.187 (0.133)	12.968 (8.002)	-0.174 (0.130)	-0.058 (0.146)
Landlocked	-5.768 (4.340)	-0.133** (0.065)	-8.869** (3.966)	-0.098 (0.065)	-0.178** (0.072)
Tropical	-6.011 (6.814)	-0.128 (0.102)	-3.117 (6.228)	-0.147 (0.100)	-0.174 (0.114)
Intercept	29.544* (15.842)	0.566** (0.241)	31.862** (14.479)	0.509* (0.238)	0.794*** (0.265)
R-squared	0.703	0.752	0.743	0.761	0.685
No. of obs.	107	107	107	107	107
Continent dummies	Yes	Yes	Yes	Yes	Yes

Notes: the results for columns (1b) and (2b) are taken from columns (2) and (3), respectively, in Table 6 whereas those of column (3) are taken from column (7) in Table 1. Figures in the parentheses indicate standard errors.

* Significance at the 10% level.
 ** Significance at the 5% level.
 *** Significance at the 1% level.

Considering the mediation effect of control for corruption, the Sobel test statistic is estimated to be 2.154, with a standard error of 0.086 and a *p*-value of 0.031. Thus, the null of no mediation is rejected at the 5% level of significance. Very similar results are obtained when alternative mediation tests

based on the Aroian and Goodman specifications are used. The results also do not alter when bootstrap confidence intervals, which do not require any assumption about the shape of the sampling distribution of the indirect effect, are considered.

Table 8
Analysis of the mediation tests.

	(1) Mediating the effect of control for corruption			(2) Mediating the effect of government effectiveness		
	Coeff.	Std. error	Test stat. (p-value)	Coeff.	Std. error	Test stat. (p-value)
<i>(A) Mediation tests</i>						
Sobel	0.185**	0.086	2.154 (p = 0.031)	0.207**	0.091	2.283 (p = 0.022)
Aroian	0.185**	0.087	2.118 (p = 0.034)	0.207**	0.092	2.250 (p = 0.024)
Goodman	0.185**	0.084	2.192 (p = 0.028)	0.207**	0.089	2.317 (p = 0.020)
Sobel (Bootstrap)	0.185**	0.088	2.090 (p = 0.036)	0.207**	0.082	2.530 (p = 0.011)
	Coeff.	Std. error	Z-stat. (p-value)	Coeff.	Std. error	Z-stat. (p-value)
<i>(B) Composition of effects</i>						
Indirect effect (Sobel)	0.185**	0.086	2.154 (p = 0.031)	0.207**	0.091	2.283 (0.022)
Direct effect	0.418***	0.154	2.720 (p = 0.007)	0.395***	0.151	2.612 (0.009)
Total effect	0.603***	0.167	3.615 (p = 0.001)	0.603***	0.167	3.615 (0.001)
% of total effect mediated	30.7%			34.4%		

Notes: The test statistics are calculated as follows: (1) Sobel = $b_1 b_3 / (b_3^2 se_{b_1}^2 + b_1^2 se_{b_3}^2)^{0.5}$; (2) Aroian = $b_1 b_3 / (b_3^2 se_{b_1}^2 + b_1^2 se_{b_3}^2 + se_{b_1}^2 se_{b_3}^2)^{0.5}$; and (3) Goodman = $b_1 b_3 / (b_3^2 se_{b_1}^2 + b_1^2 se_{b_3}^2 - se_{b_1}^2 se_{b_3}^2)^{0.5}$, where b_1 is the coefficient of STATE in the regression of the mediator (control for corruption or government effectiveness) on STATE (regressions (1a) or (2a) in Table 7), b_3 is the coefficient of the mediator in the regression of financial development on STATE and the mediator (regressions (1b) or (2b) in Table 7), se_{b_1} and se_{b_3} are the standard errors of b_1 and b_3 , respectively (see MacKinnon, 2008). The bootstrap procedure implements bootstrap estimation of percentile-based bootstrap confidence intervals for the indirect effect using 1000 random samples. These methods test the null hypothesis that there is no indirect effect from state history to financial development via the channels considered.

** Significance at the 5% level.
*** Significance at the 1% level.

Hence, the evidence presented here suggests that the mediation effect of corruption control is quite material with approximately 30.7% of the total effect of state history on financial development being partially mediated by control for corruption. There is also clear evidence supporting the notion that the effect of state history on financial development is partially mediated by government effectiveness, where the total mediation is estimated to be approximately 34.4%. Notwithstanding the presence of these effects, the indirect role of state history is both statistically and economically smaller than its direct counterpart.

5.7. Further robustness checks

It is also important to ensure that our measure of state history is not proxying for other early historical development. To do this, we directly control for biogeography, years since the agricultural transition, population density in 1 AD and duration of human settlements (civilization) in the regressions. The results reported in columns (1–4) in Table 9 suggest that not only the coefficients of these variables are statistically insignificant, but also that their inclusion does not alter our previous findings with regard to the effect of state history in any significant manner.

Columns (5) and (6) consider the influence of migration that took place since 1500 AD by pre-multiplying STATE with the global migration index of Putterman and Weil (2010), but the results are robust throughout whether state history for the whole period (1 AD to 1950 AD) or since 1500 AD are considered. In column (7) the relationship holds up when outliers are adjusted by employing a robust regression approach that eliminates outliers using Cook's distance and some iteration procedures. No influential outliers were detected and dropped, and the coefficient of state history increases by a mere 5%. In column (8), we rerun the regressions without the Neeuropes (Australia, Canada, New Zealand and the United States) which were previously dominated by the European settlers who brought in a unique set of state characteristics. The results, again, remain fairly stable. On the whole, our results are qualitatively robust to these alternative estimation strategies.

6. Conclusions

Over the past two decades economists have embraced the notion that financial development is beneficial for long-term growth. A key issue, however, remains unresolved: why do some countries

end up with good financial systems whereas others do not? Given that relatively few countries have them at the present time, this question is of importance amidst increasing financial globalization. Although the literature offers several explanations for the disparity in financial development across the globe, the historical roots of financial development are still not very well understood. This paper departs from the literature by offering a new insight into the deep underlying cause of financial system under-development. We propose that differences in financial development around the world can be explained by historical differences in the accumulation of state experience. The early existence of state government confers a developmental head start, by providing conditions that enable the formation of early financial institutions and markets. Such an early start may have a long-run effect so persistent that it continues to influence financial system development today.

Specifically, the historic presence of states unifies populations linguistically and culturally by shaping social norms and creating trust, expands demand for education and improves the cognitive framework, each of which is crucial for the operation of states and is pivotal for the early development of a financial system. Additionally, states possess the coercive power to collect taxes, enabling them to enjoy a strong financial position through borrowing and repaying debts. States also directly create financial institutions and markets, and foster their development through imposing rules, regulations and legislation. Thus, in principle, countries with long histories of nationhood tend to be associated with more efficient use of money, taxation, and government administration, which together play a paramount role in shaping the historical development of modern financial architecture.

Consistent with the above proposition, the results in this paper demonstrate that state experience accumulated since 1 AD has a statistically significant, persistent and large impact on subsequent financial development around the world. The results are very robust throughout. Even after considering different measures of state history and financial development, controlling for endogeneity, several alternative measures of early historical development and a range of other potential determinants of financial development, state antiquity is always a significant determinant of financial development. The findings in this paper highlight that state experience is an important contributor for the shaping of modern financial systems, apart from the other factors of legal tradition, geographic endowments, religion, credit power and information sharing that have been discussed in the literature. Thus, an

Table 9
Further robustness checks.

	(1) Add biogeography	(2) Add agricultural transition	(3) Add population density in 1 AD	(4) Add civilization	(5) Adjust for migration effects	(6) Adjust for migration effects	(7) Control for outliers	(8) Exclude Neo- Europes
<i>STATE</i>	0.579*** (0.168)	0.631*** (0.170)	0.619*** (0.166)	0.622*** (0.169)			0.654*** (0.166)	0.648*** (0.152)
<i>STATE</i> _{1–1950} ^{mig. adj.}					0.916*** (0.176)			
<i>STATE</i> _{1501–1950} ^{mig. adj.}						0.744*** (0.181)		
Biogeography	0.201 (0.184)							
Yrs since agr. transition		–0.023 (0.026)						
Pop. density in 1 AD			–0.006 (0.005)					
Civilization				1.144 (1.348)				
Creditor rights	0.131 (0.113)	0.123 (0.114)	0.130 (0.113)	0.133 (0.114)	0.099 (0.107)	0.104 (0.112)	0.221* (0.113)	0.229** (0.109)
Contract enforcement days	–0.583*** (0.196)	–0.566*** (0.198)	–0.579*** (0.195)	–0.606*** (0.198)	–0.566*** (0.183)	–0.538*** (0.194)	–0.595*** (0.196)	–0.656*** (0.179)
Information sharing	0.337** (0.083)	0.325*** (0.084)	0.341*** (0.083)	0.331*** (0.083)	0.248*** (0.081)	0.294*** (0.083)	0.281*** (0.083)	0.261*** (0.080)
French origin	–0.208** (0.086)	–0.191** (0.087)	–0.223** (0.087)	–0.192** (0.086)	–0.204** (0.080)	–0.236*** (0.085)	–0.121 (0.086)	–0.099 (0.082)
German origin	–0.297** (0.118)	–0.305** (0.118)	–0.331*** (0.118)	–0.307** (0.118)	–0.297** (0.109)	–0.280** (0.114)	–0.254** (0.117)	–0.186* (0.111)
Scandinavian origin	–0.676** (0.258)	–0.707*** (0.258)	–0.729*** (0.257)	–0.654** (0.262)	–0.665*** (0.240)	–0.784*** (0.255)	–0.250 (0.257)	–0.317 (0.258)
Catholic	–0.527* (0.275)	–0.545* (0.276)	–0.539* (0.274)	–0.504* (0.279)	–0.527** (0.257)	–0.578** (0.271)	–0.092 (0.275)	–0.270 (0.270)
Muslim	–1.004*** (0.263)	–0.914*** (0.262)	–0.935*** (0.257)	–0.905*** (0.264)	–0.960*** (0.240)	–0.850*** (0.250)	–0.572** (0.258)	–0.739*** (0.252)
Other religions	–0.763*** (0.258)	–0.766*** (0.258)	–0.784*** (0.257)	–0.749** (0.260)	–0.800*** (0.242)	–0.791*** (0.253)	–0.388 (0.257)	–0.591** (0.252)
Latitude	0.536 (0.396)	0.496 (0.410)	0.447 (0.406)	0.692* (0.408)	0.627* (0.368)	0.525 (0.384)	0.469 (0.392)	0.102 (0.397)
Island	–0.062 (0.146)	–0.089 (0.150)	–0.033 (0.147)	–0.005 (0.159)	–0.084 (0.137)	–0.139 (0.144)	0.010 (0.146)	–0.083 (0.149)
Landlocked	–0.174** (0.072)	–0.180** (0.073)	–0.175** (0.073)	–0.181** (0.073)	–0.181*** (0.068)	–0.187*** (0.071)	–0.170** (0.072)	–0.167** (0.067)
Tropical	–0.131 (0.121)	–0.215* (0.123)	–0.223* (0.119)	–0.177 (0.114)	–0.072 (0.110)	–0.147 (0.112)	–0.121 (0.114)	–0.153 (0.108)
Intercept	0.743*** (0.268)	0.883*** (0.283)	0.611* (0.342)	0.860*** (0.268)	0.657** (0.251)	0.603** (0.269)	0.361 (0.264)	0.624** (0.259)
R-squared	0.689	0.688	0.691	0.687	0.723	0.696	0.655	0.700
No. of obs.	107	107	107	107	107	107	107	103
Continent dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: figures in the parentheses indicate standard errors.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

important implication of this finding is that future efforts in uncovering the root causes for the variation in the level of financial development across countries should directly control for state history. Moreover, the effect of statehood on financial development is found to be more substantial both when the state has a longer historical existence and when its presence is more recent.

The results in this paper unambiguously highlight that state institutions have long-lasting effects on the developmental outcomes of the financial sector. Given that state building is an onerous process, a straight forward interpretation of these findings is that nations not endowed with favorable state historical conditions would face a somewhat gloomy development outlook. However, this would be an over-interpretation of our results. Nonetheless, they clearly provide important lessons for those countries not characterized by an early start in statehood that remain financially underdeveloped today. In particular, policy makers in these countries should be mindful that state building is a time consuming process. Thus, recognizing the important role of the state in the developmental process and approaching the construction of an effective state entity from a long-term perspective, based on some deep historical insights, may be a more promising avenue to ensure success within a reasonable time frame.

In addition, exploring alternative policy avenues to enhance state administrative capacity, creating a well-functioning bureaucratic organization, and devising diagnostic policies to remove obstacles to state construction, should be encouraged even though they are difficult to pursue and take time to bear fruit. For countries blessed with favorable state-related historical antecedents, it is imperative to reinforce their developmental trajectories through adopting functional policies and devising solutions when new challenges such as financial crises emerge. Although drawing policy relevant conclusions is not an easy task, it is clear that the findings of this study do not merely provide academic insights unrelated to the problems facing present day governments.

The analysis pursued in this paper, however, leaves several important issues unresolved. First, while the results demonstrate that countries with older state institutions are likely to have more developed financial systems today, and the effects of state on finance may in part work through corruption controls and government effectiveness, a deeper analysis of the channels through which state age generates financial development is lacking. Specifying some hypothesized mechanisms will help improve our understanding of precisely what kind of conditions have been created by the historic presence of states that ultimately favor financial development.

Second, this study highlights the fact that one of the most influential historical origins for the development of modern financial system is the age of states. Other dimensions of early development that potentially might have been important for shaping financial development, such as the use of early writing, city formation, diffusion of financial knowledge, are not considered. More research is needed to understand how these historical antecedents interact with state antiquity in shaping the evolution of financial markets and institutions.

Third, this research also raises another question: if the length of state history explains financial development in the long run, then what explains the emergence of early political institutions? However, despite being the most far-reaching political development in human history, the origin of the state and what determines the age of statehood are still not very well understood. To this end, Ang (2012) provides the first step in this direction by demonstrating that an early transition to fully-fledged agricultural production, the adoption of state-of-the-art military innovations, and more opportunity for economic interaction with the regional economic leader are potential catalysts for the rise and development of the state. However, more efforts to understand the deeper roots of state formation and the evolution of states are warranted.

Although insights from this study are drawn from a cross-sectional analysis, they do not imply perfect correlations in the sense that several exceptions contradicting the general modality do exist. For instance, while France is regarded as a relatively experienced state its public and private finances before the nineteenth century were poorly developed and replete with defaults. The Netherlands, which arguably experienced the first financial revolution in the 17th century, was institutionally fragmented at the regional level through 1800, suggesting that statehood is not necessarily a precondition for financial development to kick start. These insights clearly point to the limitation of an empirical generalization based on a cross section of countries. Sustaining our key arguments requires deeper evidence than this paper has uncovered. To this end, undertaking in-depth micro-level country-specific research or analyzing the topic from a historical comparative perspective by focusing on a few unique case studies are promising future avenues for advancing our knowledge.

Appendix A. Construction of State Antiquity (STATE)

The state antiquity index of Putterman (2004) includes 39 periods of 50 years spanning from 1 to 1950 AD. It consists of the following three components:

$ST^{PRESENCE}$: Is there a government above the tribal level? [Yes = 1; No = 0]

$ST^{AUTONOMY}$: Is this government foreign or locally based? [Local = 1; In between = 0.75; Foreign = 0.5]

$ST^{COVERAGE}$: How much of the territory of the modern country was ruled by this government? [>50% = 1; 25–50% = 0.75; 10–25% = 0.5; <10% = 0.3]

The extent of state presence (SA_t) in any particular 50 years period (t) is measured as the product of the scores on these components and 50. Consequently, a score of 0 indicates no presence of state, 25 reflects that a country has a supra-tribal authority but its entire territory is ruled by a foreign authority, and 50 indicates the presence of an autonomous nation, and so on.

$$SA_t = ST^{PRESENCE} \times ST^{AUTONOMY} \times ST^{COVERAGE} \times 50 \quad 0 \leq SA_t \leq 50, t = 1, 2, \dots, 39 \quad (A1)$$

The length of state history, or state antiquity (STATE), is measured as the cumulative presence of state by combining data over the entire 39 periods. A 5% discount rate is applied to allow for the fact that states formed in the more distant past have relatively less influence on today's economic conditions. To ease interpretation, the series is scaled into 0 and 1 using its maximum possible value. Accordingly, state history for a particular country over the last two millennia (1–1950 AD) is calculated as follows:

$$STATE = \frac{\sum_{t=1}^{39} (1.05)^{1-t} \cdot SA_t}{\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50}; \quad 0 \leq STATE \leq 1 \quad (A2)$$

The distribution of STATE and its components for our total sample of 107 countries is given in Table A1. It is evident that states in Asia and Europe are nearly twice as old as those in Africa and America. Austria, China, France, Iran, Japan, Korea, Nepal, Portugal, Switzerland and Turkey are among the nations that have accumulated the highest levels of state experience (average STATE = 0.858). Countries in Oceania, such as Australia (STATE = 0.147), New Zealand (STATE = 0.069) and Papua New Guinea (STATE = 0.021), and African nations such as the Central African Republic, Kenya, Lesotho, Sierra Leone, Togo and Zambia (average STATE = 0.064) are among those countries that have the youngest states. It is interesting to observe that the emergence of states in several sub-Saharan

Table A1
Average values of state antiquity across continents.

	PRESENCE of STATE	AUTONOMY of STATE	COVERAGE of STATE	STATE	No. of countries
Africa	0.535	0.458	0.427	0.352	32
Asia	0.892	0.705	0.812	0.637	23
America	0.498	0.367	0.454	0.325	21
Europe	0.869	0.674	0.811	0.615	28
Oceania	0.108	0.081	0.104	0.079	3
All countries	0.680	0.539	0.606	0.469	107

Notes: PRESENCE of STATE is measured as: $(\sum_{t=1}^{39} (1.05)^{1-t} \cdot ST_t^{PRESENCE} \cdot 50) / (\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50)$ and so on. $ST_t^{PRESENCE}$ captures the presence of a government above the tribal level; $ST_t^{AUTONOMY}$ reflects whether this government is foreign or locally based; and $ST_t^{COVERAGE}$ measures the proportion of the current territory covered by this government. STATE is given as: $(\sum_{t=1}^{39} (1.05)^{1-t} \cdot SA_t) / (\sum_{t=1}^{39} (1.05)^{1-t} \cdot 50)$ where $SA_t = ST_t^{PRESENCE} \times ST_t^{AUTONOMY} \times ST_t^{COVERAGE} \times 50$.

Table A2
Examples of state history construction for experienced states in each continent.

Region Country (AD)	Africa Egypt	Asia China	America Peru	Europe France	Oceania Australia
1–50	1, 0.5, 1 (under Roman's occupation)	1, 1, 1 (ruled by the Han dynasty)	0, 0, 0 (non-existence of states)	1, 0.5, 1 (Gaul was under the Roman's rule)	0, 0, 0 (non-existence of states)
51–100					
101–150					
151–200					
201–250		1, 1, 0.75 (the Han empire was split into several warring states)			
251–300					
301–350					
351–400					
401–450					
451–500				1, 1, 0.75 (controlled by multiple Germanic kingdoms)	
501–550					
551–600					
601–650		1, 1, 1 (unified under the Sui and, later, the T'ang dynasties)	1, 1, 0.5 (the Huari state existed in the southern part)		
651–700					
701–750			1, 1, 1 (Huari grew to become an empire)		
751–800		1, 1, 0.75 (central regime broke down, followed by some political chaos)		1, 1, 0.895 (rule was unified by Charlemagne in 771)	
801–850		1, 1, 1 (the T'ang power was restored)	1, 1, 0.75 (the Huari empire collapsed and the area was ruled by a number of smaller states)	1, 1, 1 (under unified domestic rule)	
851–900	1, 1, 1 (establishment of the Tulunid dynasty)			1, 1, 0.75 (rule was divided among several Frankish kingdoms)	
901–950	1, 0.5, 1 (became a foreign-based caliph province)	1, 1, 0.75 (centralized order collapsed again and multiple kingdoms emerged)			
951–1000	1, 0.77, 1 (the Fatimid Caliphate was established in 973)				
1001–1050	1, 1, 1 (under the rule of the Egypt-based Fatimids)	1, 1, 1 (power was united under the Sung dynasty)			
1051–1100					
1101–1150					
1151–1200	1, 0.855, 1 (the Ayyubid dynasty became allegiant to the foreign-based Abbasid Caliphate in 1171)				
1201–1250	1, 0.75, 1 (became quasi-independent under the Ayyubids)				
1251–1300	1, 1, 1 (under the autonomy of the Mamluk dynasty)	1, 0.895, 1 (the Yuan dynasty was established in 1279)		1, 1, 1 (under centralized rule and area expanded to nearly its current size)	
1301–1350		1, 0.75, 1 (under the quasi-local Mongol rule)			
1351–1400		1, 0.91, 1 (the Yuan dynasty collapsed and replaced by the Ming dynasty in 1368)		1, 0.75, 0.75 (a large part of the area was held by the English during the Hundred Years War)	

Table A2 (continued)

Region Country (AD)	Africa Egypt	Asia China	America Peru	Europe France	Oceania Australia
1401–1450		1, 1, 1 (the Chinese rule was integrated under the Ming and Ch'ing dynasties)			
1451–1500			1, 1, 1 (the Inca empire united the entire area)	1, 1, 1 (the Hundred Years War ended and territory was regained)	
1501–1550	1, 0.67, 1 (conquered by the Ottomans in 1517)		1, 0.82, 1 (conquered by the Spanish in 1532)		
1551–1600	1, 0.5, 1 (under the Ottomans' rule)		1, 0.5, 1 (under the Spanish colonial rule)	1, 1, 0.75 (rule was divided by domestic religious wars)	
1601–1650				1, 1, 1 (mostly under unified control)	
1651–1700					
1701–1750					
1751–1800					
1801–1850	1, 0.75, 1 (allowed partial autonomy under the Ottomans and the French)		1, 0.79, 1 (gained independence in 1821)		1, 0.75, 1 (British settlement)
1851–1900	1, 0.66, 1 (under the British occupation in 1882)		1, 1, 1 (under independent rule)		1, 1, 1 (gained independence from Great Britain)
1901–1950	1, 0.78, 1 (independent from Britain in 1922)	1, 1, 0.875 (The Ch'ing rule ceased in 1911 and was replaced the Republic of China, but the nation was politically fragmented)			

Notes: The values in each entry reflect $ST^{PRESENCE}$, $ST^{AUTONOMY}$ and $ST^{COVERAGE}$. For instance, $ST^{PRESENCE}$ is 1, $ST^{AUTONOMY}$ is 0.5 and $ST^{COVERAGE}$ is 1 for Egypt in every 50-year period from 1 to 850 AD. Source: Putterman (2004).

Table A3

Examples of state history construction for inexperienced states in each continent.

Region Country (AD)	Africa Kenya	Asia Philippines	America Uruguay	Europe Moldova	Oceania Papua New Guinea
1–50	0, 0, 0 (non-existence of states)	0, 0, 0 (non-existence of states)	0, 0, 0 (non-existence of states)	0, 0, 0 (non-existence of states)	0, 0, 0 (non-existence of states)
51–100					
101–150					
151–200					
201–250					
251–300					
301–350					
351–400					
401–450					
451–500					
501–550					
551–600					
601–650					
651–700					
701–750					
751–800					
801–850					
851–900					
901–950					
951–1000				1, 0.5, 1 (ruled by Kievan Rus)	
1001–1050					
1051–1100					
1101–1150					
1151–1200					
1201–1250				1, 0.5, 1 (pledged allegiance to the Tartars)	
1251–1300					
1301–1350					
1351–1400					
1401–1450				1, 0.5, 1 (became part of the principality of Moldavia until 1513)	
1451–1500					
1501–1550		1, 1, 0.75 (ruled by two local Islamic sultanates)			

(continued on next page)

Table A3 (continued)

Region Country (AD)	Africa Kenya	Asia Philippines	America Uruguay	Europe Moldova	Oceania Papua New Guinea
1551–1600		1, 0.75, 0.75 (partially occupied by the Spanish)			
1601–1650		1, 0.5, 1 (rule was unified the Spanish)		1, 0.5, 1 (belonged to the Ottoman Empire)	
1651–1700					
1701–1750			1, 0.5, 1 (occupied by foreign forces)		
1751–1800					
1801–1850			1, 0.72, 1 (independent since 1828)		
1851–1900					
1901–1950	1, 0.5, 1 (became a colony of the British)	1, 0.75, 1 (local autonomy coexisted with control by the United States)	1, 1, 1 (under independent rule)	1, 0.5, 1 (largely occupied by Soviet Union)	1, 0.5, 0.75 (occupied by the British, Germans, and Dutch)

African countries, such as the Central African Republic, Gabon, Kenya and Zimbabwe, was in fact the outcome of the 19th century colonization by the Western powers, either the British or the French, without which these nations may not have existed.

Tables A2 and A3 illustrate how the state history index is constructed for older and younger states, respectively, in each continent by giving a country example for each continent. The relatively experienced states considered are Egypt (Africa), China

(Asia), Peru (America), France (Europe) and Australia (Oceania) whereas the relatively inexperienced states are Kenya (Africa), the Philippines (Asia), Uruguay (America), Latvia (Europe) and Papua New Guinea (Oceania).

Appendix B. Data appendix

See Table A4.

Table A4

Description of variables and data sources.

Variable	Description	Source
State antiquity	Index of state history, scaled to take values between 0 and 1 (more detailed description is provided in Appendices A and B)	Putterman (2004)
Private credit/GDP	Credit extended by deposit taking financial institutions to the private sector as a percentage of GDP, average over 2000–2009	Beck and Demirgüç-Kunt (2009)
Liquid liabilities/GDP	The ratio of M3 to GDP, average over 2000–2009	Beck and Demirgüç-Kunt (2009)
Deposit money bank assets/GDP	Deposit money bank claims on domestic non-financial real sector as a ratio of GDP, average over 2000–2009	Beck and Demirgüç-Kunt (2009)
Stock market capitalization/GDP	Market value of all traded stock as a percentage of GDP, average over 2000–2009	Beck and Demirgüç-Kunt (2009)
Stock market total value traded/GDP	Total shares traded on the stock market exchange as a ratio of GDP, average over 2000–2009	Beck and Demirgüç-Kunt (2009)
Stock market turnover ratio	Stock market capitalization divided by stock market total value traded	Beck and Demirgüç-Kunt (2009)
Creditor rights	An index reflecting the extent of credit power of secured lenders in the event of bankruptcy, scaled to take values between 0 and 1	Djankov et al. (2007)
Contract enforcement	The number of days to resolve a payment dispute through courts, scaled to take values between 0 and 1	Djankov et al. (2007)
Information sharing	A dummy variable that signifies the presence of either a public registry or a private bureau which facilitates the dissemination of credit information of borrowers among financial intermediaries	Djankov et al. (2007)
Legal origins	A dummy variable that identifies the legal tradition of the company law or commercial code of each country as British, French, German or Scandinavian	La Porta et al. (2008)
Religion variables	Percentage of the population of each country that belonged to Catholic, Protestant, Muslim or others in 1980 (or 1990–1995 for countries formed more recently), scaled to take values between 0 and 1	La Porta et al. (1999)
Latitude	Absolute value of the latitude of the country, scaled to take values between 0 and 1	La Porta et al. (1999)
Island	A dummy variable equal to 1 if a country is an island	Acemoglu et al. (2002)
Landlocked	A dummy variable equal to 1 if a country is fully enclosed by land	Acemoglu et al. (2002)
Tropical	A dummy variable equal to 1 if a country is classified as having a tropical climate	Comin et al. (2010)
Technology adoption	The average adoption rate of technology covering the following sectors: agriculture, transportation, communications, industry and military	Comin et al. (2010)
Geographical distance to the regional frontier	'Haversine' distance from one of its two frontiers in the same continent, where the frontiers are identified as the two countries having the highest population density in that continent in 1 AD; The 'Haversine' formula calculates the shortest distances between two points on the surface of a sphere from their longitudes and latitudes	Central Intelligence Agency for longitudes and latitudes; Worldmapper (http://www.worldmapper.org/) for population density

Table A4 (continued)

Variable	Description	Source
Genetic distance to the global frontier	The degree of genealogical dissimilarities or historical unrelatedness for a particular country relative to the technological frontier in 1 AD, i.e., Italy is measured using the fixation index (F_{ST}) genetic distance data as of 1500 AD	Spolaore and Wacziarg (2009)
State stability	Constructed by taking one minus the state fragility index relative to its maximum value where the fragility index scores each country on both effectiveness and legitimacy in the security, political, economic, and social dimensions	Marshall and Jaggers (2010)
Control for corruption	An index reflecting perceptions of the extent to which state power is used to obtain private gains	Kaufmann et al. (2010)
Government effectiveness	An index reflecting perceptions of the quality of public services, policy formulation and implementation	Kaufmann et al. (2010)
Political stability	An index reflecting perceptions of the likelihood that the government will be destabilized or toppled	Kaufmann et al. (2010)
Income growth	Annual growth rate of real GDP per capita	World Development Indicators (2012)
Income levels	GDP per capita based on purchasing power parity (constant 2005 international dollar)	World Development Indicators (2012)
Trade openness	The sum of exports and imports of goods and services as a share of GDP	World Development Indicators (2012)
Financial openness	Total assets and liabilities of debt and equity instruments over GDP	Lane et al. (2007)
Ethnic fractionalization	Captures the probability that two randomly chosen individuals from a country are from different ethnic groups	Alesina et al. (2003)
State ownership of banks	Share of the assets of the top 10 banks owned or controlled by the state in 1995	La Porta et al. (2002)
Biogeography	The first principal component of the numbers of locally available wild animals and plants about 12,000 years ago, which are edible to humans or carry economic values, scaled to take values between 0 and 1	Olsson and Hibbs (2005)
Years since agricultural transition	The number of years elapsed since the transition to agriculture was estimated to occur (in thousand years)	Putterman (2006)
Population density	The population divided by land area	Worldmapper (http://www.worldmapper.org/)
Civilization	The historical duration of human settlements (in million years)	Ahlerup and Olsson (2012)
Global migration index	Provides composition of the current population for each country by the country of origin, after adjusting for the effects of cross-border movements of people from 1500 AD to 2000 AD	Putterman and Weil (2010)

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