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THE IMPORTANCE OF EFFECTIVE STATES: STATE CAPACITY AND ECONOMIC DEVELOPMENT

Sam van Noort

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Political scientists have long suspected that differences in the degree to which governments are able to effectively implement and enforce public policy (i.e. state capacity) are at the root of economic (under)development. Measurement error and endogeneity have, however, prevented researchers from obtaining a credible estimate of the effect of state capacity on economic performance. Using an improved measure of state capacity and exposure to 1700-1788 inter-state warfare as an instrument, I find that state capacity alone is able to explain 57% of all cross-country differences in GDP per capita and that its effect is larger than other prominent explanations for cross-country differences in economic development, such as: constraints on the executive, democracy, latitude, landlockedness, social capital, natural resources, legal origins, ethnic fractionalization, and others. Using mediation analysis I find that state capacity affects economic development through factors that enable markets to allocate resources more efficiently (law and order), and through better performance in sectors where market failures are prone to arise (education, infrastructure, and technology). I find that these results are robust to more than 100 controls and show empirically that the IV estimates are robust to relatively large violations of the exclusion restriction. I also find that state capacity explains a significant fraction of cross-country growth rates over the 1950 to 2010 period.

The Importance of Effective States: State Capacity and Economic Development

Sam van Noort*
University of Cambridge

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Abstract

Political scientists have long suspected that differences in the degree to which governments are able to effectively implement and enforce public policy (i.e. state capacity) are at the root of economic (under)development. Measurement error and endogeneity have, however, prevented researchers from obtaining a credible estimate of the effect of state capacity on economic performance. Using an improved measure of state capacity and exposure to 1700-1788 inter-state warfare as an instrument, I find that state capacity alone is able to explain 57% of all cross-country differences in GDP per capita and that its effect is larger than other prominent explanations for cross-country differences in economic development, such as: constraints on the executive, democracy, latitude, landlockedness, social capital, natural resources, legal origins, ethnic fractionalization, and others. Using mediation analysis I find that state capacity affects economic development through factors that enable markets to allocate resources more efficiently (law and order), and through better performance in sectors where market failures are prone to arise (education, infrastructure, and technology). I find that these results are robust to more than 100 controls and show empirically that the IV estimates are robust to relatively large violations of the exclusion restriction. I also find that state capacity explains a significant fraction of cross-country growth rates over the 1950 to 2010 period.

***Keywords*:** Institutions, Economic Development, State Capacity, Private Property Rights, Human Capital Accumulation, Public Goods, Law and Order, Technology.

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Introduction

Huntington (1968: 1) begins his classic analysis on political order with the insight that: "*The most important political distinction among countries concerns not their form of government but their degree of government*". The role of state capacity, understood as the capacity of a government to effectively implement and enforce policy across its territory, has since then increasingly come to the forefront in much of recent political science research.[1] Rothstein (2011), for example, finds that "government effectiveness" as measured by the World Governance Indicators is strongly correlated with GDP per capita, infant mortality, life expectancy, subjective feelings of personal happiness, and other measures of well-being. Dincecco and Prado (2012) and Dincecco and Katz (2016) find that taxation as a percentage of GDP, which they take as a measure of state capacity, is strongly correlated with GDP per capita in a large cross-section of countries, as well as with economic growth over the 1650 to 1913 period among 11 European states. A more longstanding qualitative-historical literature identifies the state's incapacity to constrain violence and provide public goods as one of the most important constraints on economic development in underdeveloped countries (Fukuyama 2014, 2004; Migdal 1988; Bates 2001).

Although this existing case study and regression evidence is rich and surely suggestive of a large and robust correlation between state capacity and economic performance it has failed to provide credible evidence that this relationship is causal. First, it is quite likely

[1] I here define state capacity as what Mann (1984) has referred to as "infrastructural state power" (see Soifer (2008) for a detailed description of this concept and its uses). Many authors have used different labels for Mann's (1984) concept, such as: "state power" (Skocpol 1979; Tilly 1990), "state strength" (Migdal 1988), and "state capacity" (Hui 2005; Fukuyama 2013). All of these terms essentially describe the same background concept: the ability of states to implement and enforce policy effectively (Ottervik 2013). To stay in line with most of the recent literature I choose to use the label of "state capacity". Other concepts, such as "the quality of government" (Agnafors 2013; Rothstein 2011), tend to be broader by also including aspects related to the regulation of state power (i.e. the rule of law). Concepts such as "bureaucratic capacity" (Carpenter 2001; Evans and Rauch 1999; Geddes 1994; Skowronek 1982; Evans 1995), "state autonomy" (Bates 1981; Evans 1995; Nordlinger 1982; Skocpol 1979; Waldner 1999), and the absence of "corruption"/"impartiality" (Rothstein and Teorell 2008) are potential causes of state capacity (Soifer and Vom Hau 2008).

that ones countries grow rich they choose, or can afford, institutions that enhance state capacity. Second, unobserved factors might simultaneously determine state capacity and economic development rendering the observed association spurious. Comparative case study and ordinary least squares (OLS) regression analysis are poorly suited to deal with these types of threats to causal inference.

In addition, the indicators used to measure state capacity in existing studies are likely to be unsuitable for that purpose. Widely used survey measures, such as those of the World Governance Indicators and the International Country Risk Guide, tend to measure other things besides a governments' capacity to effectively implement and enforce policies.[2] Tax extraction relative to GDP, another commonly proposed measure of state capacity (Lieberman 2002), is also likely to suffer from measurement validity issues given that increases in tax extraction on higher levels of extraction probably reflect more ideological choices than real increases in capacity (Fukuyama 2013). Such measurement error appears to be quite large and is not random rendering regression coefficients invalid (even in instrumental variable regressions).

Furthermore the existing literature has not (yet) established clearly through which causal mechanisms state capacity may affect economic development. Whether state capacity affects economic development primarily through law and order and private property rights security (legitimizing a narrow "night-watch state" model), or (also) significantly affects economic performance by alleviating market failures that otherwise risk retarding economic development (legitimizing more broader state intervention), has important policy implications, particularly in poor countries where resources and institutional capacity are severely limited.

This paper attempts to mitigate these limitations of the existing literature by using a

[2]Most notably they typically do not make a distinction between effective law enforcement and accountability mechanisms (which are more related to Mann's (1984) concept of "despotic state power"), and tend to include factors that are related to the content or stability of policymaking. Furthermore, some take "public service" outcomes in area's such as health, education, and sanitation services as measures of state capacity while these outcomes are very likely to be influenced by other factors, besides state capacity, as well.

more precise measure of state capacity, by using an instrument for state capacity, and by modeling empirically the causal mechanisms through which state capacity affects economic development.

As my measure of state capacity I use the new "effective enforcement" indicator of the World Justice Project. This survey variable significantly improves upon existing measures by asking respondents to imagine what would typically happen in very precisely defined everyday scenarios of law violations across a wide range of socio-economic spheres. It minimizes the risk that survey respondents are subtly influenced by their countries' past economic performance, avoids measuring outputs that could be affected by other factors besides a states' capacity to effectively implement and enforce public policy, and measures the concept of state capacity more precisely than "input-measures" such as the degree of "Weberianness" in bureaucratic selection and promotion.

As an instrument for state capacity I exploit differences in exposure to "premodern" warfare. The identifying assumption is here that countries that were historically more exposed to inter-state warfare are more likely to have build up the institutional capabilities that enable states to effectively implement and enforce public policy,[3] while inter-state warfare, particularly far back in time, is unlikely to have effected current levels of economic development through factors other than state capacity.

To measure exposure to premodern warfare I use data from Dincecco and Prado (2012) on causalities of inter-state warfare per sq. km in the period from 1700 to 1789.[4] I argue that

[3]A widely held theory in political science, history and sociology is that war and the existential threat that war poses to the population and political elite of a country is an important historic cause for differences in today's levels of state capacity. Historically, it was the extreme threat of war that got political elites serious about building bureaucracies that could effectively tax, enforce rules, monitor populations, coordinate economic behavior and provide public goods (including law and order and the protection of the states' territory itself) (Fukuyama 2014). In line with this theory I indeed find that exposure to pre-1789 warfare is strongly related to current levels of state capacity. This is evident in first-stage F-statistics that regularly exceed or are close to 10.

[4]The measurement of my instrument relies heavily on Dincecco and Prado (2012) who use causalities in inter-state warfare (per sq. km) from 1816 to 1913 as an instrument for direct tax extraction (relative to GDP). My econometric specification is substantively different from Dincecco and Prado (2012), however.

this is the best measure of exposure to premodern warfare because: (1) data on causalities of war is relatively precise and widely available for many country-years since 1700. This is not the case for data on war expenditure; (2) data from before 1700 is unavailable outside of Europe, while including data from after 1789 is likely to increase the probability that the instrument is affected by economic development itself, or that the instrument is associated with current economic outcomes through different type of institutions besides state capacity; and (3) reliable data on territory and population sizes are not available for most country-years during the 18th century. Net changes in territory have meanwhile been much smaller than net changes in population sizes since 1700.[5] I extensively discuss the consequences of these choices below.

In terms of the instruments' validity I acknowledge that the exclusion restriction were instrumental variable estimates rely upon is only plausible, and not certain, to hold.[6] Nonetheless I provide an extensive amount of empirical evidence that suggests that exposure to premodern warfare is indeed likely to be relatively exogenous to the determination of today's levels of economic development, and that exposure to premodern warfare is also likely to have affected current economic performance only through state capacity. I show: (1) that leaders generally went to war without reference to the existing level of state capacity or economic development in their country; (2) that exposure to warfare over the 1700 to

First, I do not measure state capacity through the level of tax extraction relative to GDP for reasons outlined above. Second, I do not include area size as an additional instrument next to exposure to premodern warfare. Including area size could violate the exclusion restriction because it is plausibly related to economic performance through other channels besides state capacity as well (see Bazzi and Clemens (2013) for an extensive discussion). Last, I choose to study exposure to premodern warfare from *before* the French Revolution and the European Industrial Revolution. This reduces problems related to omitted variable bias and reversed causality, and only helps to isolate the effect of state capacity from (electoral) democracy and checks and balances institutions (given that these have almost exclusively been introduced after the French Revolution). Nonetheless all results also hold when using the 1816 to 1913 data.

[5]Nonetheless my instrumental variable results are robust to a large number of alternative operationalizations of exposure to premodern warfare, such as: the absolute number of causalities in inter-state warfare from 1700 to 1789, causalities per capita of current population, and using data on causalities of inter-state warfare from 1816 to 1913.

[6]The IV estimates should therefore, in my view, be regarded as an important complement, not a complete substitute, to the OLS results which in themselves are novel.

1789 period is not associated with the 1700 level of political centralization, GDP per capita, urbanization, and population density; (3) that even countries that were solely attacked by other countries (i.e. countries that did not self-select into war) also have significantly higher levels of state capacity and economic development today; (4) that the effect of historic war causalities on both state capacity and economic development is robust to a large set of control variables that could be associated with both historic levels of war causalities and current levels of state capacity and economic development[7]; (5) that the effect of historical war causalities on current levels of economic development is *only* mediated by state capacity, as opposed to other types of political institutions that could potentially have been affected by exposure to premodern warfare (i.e. (electoral) democracy and checks and balances)[8]; and (6) that all results hold when controlling for regional and continental fixed effects (including for Europe).[9] In addition, I exploit the technique of Conley, Hansen and Rossi (2012) which enables me to generate upper and lower bounds on my IV estimates even when the exclusion restriction is partly violated. The results from this exercise suggest that even if more than half of the effect of war causalities per sq. km (1700-1788) on current levels of GDP per capita PPP is due to factors other than state capacity that the effect of state capacity on economic development is, with 95% certainty, positive and statistically significant.

Employing this empirical strategy I find that state capacity alone explains approximately 57% of all cross-country differences in GDP per capita, and that its effect is significantly larger than other prominent explanations for cross-country differences in economic development, such as: constraints on the executive, democracy, latitude, landlockedness, social capital,

[7]I believe that the risk of reversed causality, and to a lesser extent omitted variable bias, is in general strongly reduced by using war causalities data from before the 19th century (the moment when levels of economic development started to diverge significantly across countries).

[8]My instrumental variable approach isolates, by the same token, the effect of state capacity from these other type of political institutions (i.e. the instrumental variable results cannot reflect the situation were state capacity mediates some of the effect of democracy and/or checks and balances on economic development).

[9]This is important because European countries were particularly exposed to warfare during the 1700 to 1789 period and because Herbst (2000) has questioned whether differences in exposure to historic warfare can explain differences in state capacity outside of Europe.

natural resources, legal origins, ethnic fractionalization, and others. I also find that the instrumented version of state capacity explains a large part of the between-country differences in economic growth rates over the 1950 to 2010 period (even when controlling for the initial level of human- and physical capital stock, and initial log GDP per capita).[10] In terms of the causal mechanisms I find, in OLS and three-stage least squares (3SLS) regression models, that state capacity affects economic development through factors that enable markets to allocate resources more efficiently (law and order), and through better performance in sectors where market failures are prone to arise (education, infrastructure, and technological advancement). Employing a large number of robustness checks I find that these results are robust to over 100 control variables, different sample restrictions, and alternative measures of economic development.

The results have several important theoretical and policy implications. Political scientists and economists that study the process of economic development in comparative perspective have since North (1990) reached a widespread consensus that institutions are the most important cause of cross-country differences in economic performance. There, however, remains considerable controversy about which *type* of institutions are most important for economic development. The majority of the current economics literature suggests that private property rights security is the fundamental factor that underlies divergent patterns of economic development, and that differences in private property rights security are in turn best explained by the extent to which the political institutions of a country are able to effectively constrain the despotic behavior of state executives through competitive elections and/or formal checks and balances (see, for example, the work of: Acemoglu, Johnson and Robinson (2001, 2005), North and Weingast (1989), Moselle and Polak (2001), Olson (1993),

[10] I am able to examine the effect of state capacity on post-World War II growth rates, although time series data on state capacity is lacking, because my instrumental variable approach exploits that part of current levels of state capacity that was determined by exposure to warfare from 1700 and 1789 and persisted over time.

Grossman and Kim (1995), Besley and Ghatak (2009), and Keefer and Knack (1997)). The results from this study to some extent question this perspective. The results reveal that checks and balances and (electoral) democracy are only weakly correlated with income levels, and negatively correlated with growth rates, after the role of state capacity is properly taken into account. The instrumental variable approach excludes the possibility that this is due to state capacity mediating the effect of (electoral) democracy and checks and balances on economic development. The results are therefore more in line with much of the political science and (older) development economics literature emphasizing the importance of market failures and effective government intervention for economic development. This implies shifting more intellectual and political resources towards understanding how states can be helped to effective implement and enforce policy, rather than (only) how state action can be held more accountable through a more effective separation of power and/or through regular competitive elections. As my results show constraints on the executive, (electoral) democracy, and state capacity do not always come together and the data certainly does not suggest that institutional checks and balances and (electoral) democracy increase a state's capacity to effectively implement and enforce policy. A development policy that solely focuses on improving the functioning of accountability institutions is therefore unlikely to be effective.

The rest of the paper is organized as follows. The next two sections discuss how state capacity might affect economic development. I here argue that effective state enforcement is both a pre-condition for markets to function effectively (through the provision of law and order), as well as a necessary condition to improve on the allocative efficiency of the market mechanism in the context of market failures (particularly in the education, technology, and infrastructure sectors). The fourth section discusses the data that I employ to test these hypotheses. The fifth section presents the OLS results. The sixth section reports the instrumental variable results. The final section highlights several implications for future research.

State Capacity and Private Property Rights

One core reason why state capacity is essential for economic development is because well-functioning markets (particularly markets that can facilitate exchange on a large, and impersonal, basis) are themselves dependent upon a complex set of institutions that are (partly) dependent upon effective state enforcement (Rodrik 2000). These factors (at the minimum) include the enforcement of private property rights through avoiding/punishing crime.[11]

Virtually all schools of thought accept that the protection of human life and property is a public good (i.e. non-payers also benefit of law and order) and a natural monopoly (i.e. the existence of more than one organization with the legitimacy to use force is likely to lead to widespread lawlessness and/or civil war), which therefore can only be provided effectively by a (capable) state.[12] In line with this the historical record indeed suggests strongly that the absence of a centralized authority with an effective monopoly on the use of violence has typically come together with widespread lawlessness and instability (North, Wallis and Weingast 2009; Pinker 2011).

The central problem is, however, that with granting the monopoly on legitimate violence to the state one enables governments not only to protect citizens from each other, but also,

[11]In reality the well-functioning of markets is contingent upon a much broader institutional matrix that reduce "transaction costs". Transaction costs are the resources that have to be invested in order to organize economic exchange through the market system (Coase 1937). These costs consist of: (1) search and information costs; (2) bargaining and decision costs; and (3) policing and enforcement costs (Dahlman 1979). Transaction costs have two important consequences for the efficiency by which market systems are able to allocate resources. First, given that there exists a cost of participating in the market which is not internal to the value of the good being exchanged, less exchanges will take place than are (socially) optimal. This implies that not all (theoretical) gains of trade can be reaped rendering the division of labor in society less than (theoretically) optimal. This also means that there is room for externalities even when property rights are well-defined defined and perfectly enforced (Coase 1960; Dahlman 1979). Second, some of the resources of a society will be diverted from productive purposes towards activities that reduce the uncertainty in transacting, which means that not all resources available to a society will be put to their (theoretically) most productive use (even when assuming full competition).

[12]This view is shared by all except for political anarchists who believe that the monopolization of violence is unnecessary because it can be substituted by voluntary arrangements between sovereign individuals.

by the same token, gives state executives the power to themselves violate the human- and property rights of their citizenry (Weingast 1995; Bates 2017). It is indeed this concern that has informed most of the recent work in political economy, where scholars have found strong effects of private property rights security on economic development (Acemoglu, Johnson and Robinson 2001), and claim that the main cause of differences in private property rights security are differences in the degree to which a country's institutions constrain despotic state power (Acemoglu, Johnson and Robinson 2005).[13]

It is often left unnoticed, however, that this assumes implicitly that state actors, not private agents, are the largest, or at least the most important, violators of private property rights. Yet it is empirically unclear if expropriation by governments, rather than conflicts over property with other private agents, is indeed typically the largest investment risk citizens and private corporations in today's developing countries face. While direct and indirect government expropriation surely does occur, and certainly has occurred in the past, it is not obvious that they happen often *enough* to explain much of the very large income differences that exist across countries (even when assuming that state expropriations do significantly reduce private investment). The work of Li (2009), Kobrin (1984), Hajzler (2012), and Guriev, Kolotilin and Sonin (2011) suggests that state expropriations rarely affect more than a few percent of all firms in a country over long stretches of time, and that affected private actors are strongly concentrated in only a small number of countries and within only a small number of sectors (particularly petroleum and mining).[14] More importantly, even in these cases, investment is found to react only weakly, or not at all, to significant cases of state expropriation (Hajzler 2012). Furthermore van Noort (2017) shows that institutional

[13]I define "despotic state power" by Mann (1984: 113): "[...] the range of actions which the elite is empowered to undertake without routine, institutionalized negotiation with civil society groups." Existing studies focus, for example, on: to what extent courts function independently of the government, the extent to which there exist regular free and fair elections, and the extent to which most (important) legislation is produced by an independent parliament rather than by the executive branch itself.

[14]Note, however, that small and indirect forms of state expropriation are arguably hard to measure.

constraints on despotic state power, as it is conventionally measured by Polity IV's constraints on the executive and competitive multi-party election variables, explains little to nothing of cross-country differences in commonly used survey measures of private property rights security.

If indeed the effect of private property rights security on economic development is large and causal, it is perhaps more the *absence* of an effective state to avoid property rights violations between private agents, than the *presence* of predatory state agents, that renders private property rights insecure in many of today's developing countries. To effectively enforce private property rights the state requires substantial capacity to register property (such as real estate and business registration) and to monitor its population (in order to detect theft, and survey changes in property ownership and value). If the state is to be effective in curtailing private predatory behavior, even of society's most powerful members, it also requires a certain degree of autonomy of civil society (Fukuyama 2014). If these capacities are low, as they typically are in developing countries today, it is likely that, even in the context of significant institutional constraints on despotic state power, private property rights are highly insecure. This is particularly so because the state agencies that constrain despotic state power (the parliament and the judiciary) are *not* the same state agencies that are responsible for the (physical) implementation and enforcement of private property rights (the bureaucracy; in particular, the police and the state agencies that register and monitor property).

State Capacity and Market Failures

Besides supporting the market through law and order, effective states play a decisive role in overcoming several important market failures which otherwise risk retarding economic development. (Endogenous) growth theory highlights the importance of knowledge spill-overs

(Frankel 1962; Romer 1986), human capital accumulation (Lucas 1988), and research and development (Romer 1990; Jones 1995) for economic development. As is well understood, the accumulation of all these factors entail overcoming important market failures due to externalities.[15]

The provision of large-scale infrastructure, central to expanding the size of the market and deepening the division of labor, is another factor that is central to economic development but prone to large market failures.[16] This is so because with many large-scale infrastructures it is impossible (flood protection), very costly (roads, bridges, tunnels), or considered immoral (clean water, sewage system) to exclude people from consuming them. Furthermore, large-scale infrastructure markets tend to be natural monopolistic in nature because in many of these markets potential competitors face such high barriers to market entry – due to the need of large fixed investments in markets where the ever increasing economies of scale naturally benefit the (already established) firm with the largest market share – that markets tend to be, or converge, to monopolies. Examples include, among other large-scale infrastructure markets: roads, railways, bridges, tunnels, water-, sewage-, internet-, telecommunication-, and electricity systems (Mankiw and Taylor 2011).

Importantly, none of these, or any other, market failures, are likely to be reduced/avoided by (merely) enhancing the institutions that the existing literature on institutions and economic development tends to emphasize (i.e. those political institutions meant to constrain despotic state power through competitive multi-party elections and formal checks and balances).

[15] An individual's choice to pursue education spills over into societal benefits in the form of greater economic productivity even among uneducated workers (through technological advancement that also benefits uneducated workers), and better health and human capital outcomes among family/community members (particularly children of more educated women) (Summers 1992; Aghion et al. 2009). Research and development, and technological advancement more broadly, is prone to externalities because ideas are non-excludable (and non-rival) (Stiglitz 1999). Jones and Williams (1998) find that the level of (socially) optimal investment in research and development is, even in advanced economies, at least two to four times higher than actual investment.

[16] See for the importance of large-scale infrastructure for development: Fernald (1999), Donaldson and Hornbeck (2016), Donaldson (forthcoming), Röller and Waverman (2001).

Recognizing this virtually all governments in the world intervene in education, technology, and infrastructure markets (and, as is well know, they do so with widely varying success). Governments intervene either by regulating private provision (subsidizing private education, increasing the appropriability of returns to knowledge by strengthening intellectual property rights, and contracting with private producers of large-scale infrastructure), or by providing these goods themselves (public schooling, public research universities/institutes, and public infrastructure). Both of these public policy options require the state: (1) to have substantial capacity to select and regulate private education providers or to produce high quality education itself; (2) to have the capacity to select promising research programs and scientists, or to operate patent offices that are able to monitor inventions (globally) and detect and punish intellectual property rights violators; and (3) require the state to have the capacity to implement or monitor large, capital-intensive, and complex long-term infrastructure projects. Governments of countries with little state capacity are unlikely to manage any of these tasks effectively, leaving their citizens with few possibilities to nurture their human capital, to produce and benefit of technological advancement, and to take advantage of market opportunities and knowledge outside their direct geographical surrounding.

Data and Measurement

To test the hypothesis that state capacity, understood as a governments capacity to effectively implement and enforce public policy, causes economic development, and that it does so through both increasing law and order and through increasing educational, infrastructural, and technological capacities, I employ a large number of datasources which I describe in the four sections below. I choose to take countries as the unit of analysis because by far most differences in economic development exist between countries rather than within countries

(Milanovic 2013).[17]

Measurement of dependent variable

My measure of a country's level of economic development is its natural log of GDP per capita in purchasing power parity (PPP) terms. The GDP data is taken from the World Bank Development Indicators database and refers to the year 2014. As a robustness check I use the Human Development Index (HDI) as a broader measure of human well-being, and mortality rate under-5 (per 1,000 live births) as a more narrow measure of economic development.

Measurement of independent variable

Measuring state capacity is challenging given that a states' capacity to effectively implement and enforce public policy can vary significantly across government agencies.[18] Measuring state capacity is further made difficult because although institutional "inputs" (e.g. selection procedures of bureaucrats) do not necessarily lead to more effective law enforcement, bureaucratic outputs (e.g. school/road quality) are not necessarily only influenced by a government's capacity to effectively implement and enforce policy (Fukuyama 2013).

Taking these concerns into account I choose to operationalize state capacity by the "effective enforcement" indicator of the World Justice Project (this is the subcomponent "Government regulations are effectively enforced" of "Factor 6: Regulatory Enforcement").[19]

[17] Milanovic (2013) estimates that approximately 75 to 80% of all differences in individual-level income exist between people from different countries, rather than between individuals from the same country. When one excludes a few very rich people in very poor countries one finds that virtually all differences in material well-being exist between countries. To illustrate, the average income in PPP-terms of a rich person (top 10 percent of within-country income distribution) in a poor country (bottom 10 percent of between-country income distribution) is more than three times lower than a similarly defined poor person in a rich country (Rodrik 2011).

[18] In addition, state capacity varies significantly within countries (Soifer 2008; Gingerich 2013). As I choose to study state capacity's effect on the country level I average out these differences.

[19] See for the variable's full codebook: `https://worldjusticeproject.org/sites/default/files/documents/rolindex2016_variables.pdf` (pages 21-23) [Date last assessed: October 6, 2017]

This variable is generated through citizen surveys, triangulated by expert assessments, asking respondents to imagine what would typically happen in a large number of very precisely defined real-life scenarios of law violations. Examples include:

> "Think about business owners engaging in small operations (for example, selling food in a small establishment). How likely do you think it is that these people would be fined if they: *Engage in the business operation without the required documentation* and *Do not register to pay taxes when they should*."

> "How likely is a mid-size manufacturing firm to be routinely audited/inspected by the labor authorities?"

> "How frequently would you say that: – In practice, large public hospitals comply with all applicable public health regulations."

> "How frequently would you say that: – In practice, public funds spent on dietary supplements actually reach poor children."

This variable measures directly to what extent a state succeeds in enforcing its rules upon society within a wide range of socio-economic spheres (labor, health, environment, and business law), while avoiding to ask respondents to grade their governments' performance on the basis of an abstract concept of which interpretations are likely to differ across countries.[20] Importantly, although it measures outputs, it only measures outputs that are very unlikely to be caused by other factors besides state capacity. It therefore enables me to measure the concept of state capacity more precisely than "input-measures", while not conflating the measurement of state capacity with other factors. The key disadvantage of this measure is

[20]Note that the variable is created in two steps. The index first takes the (unweighted) average score given by respondents on a large number of survey questions asking how effective labor, environment, public health, and commercial regulations are enforced in their country. The final score is then calculated by taking the simple (unweighted) average of all four domains. The variable therefore regards the effectivity of enforcement in all four socio-economic domains as equally important.

that it lacks data from before 2013, which effectively excludes studying the effect of changes in state capacity within countries over time.

There are two main alternatives to measuring state capacity through the "effective enforcement" indicator of the World Justice Project (WJP): (1) the "objective" measure of tax extraction relative to GDP[21]; and (2) the commonly used "government effectiveness" variable of the World Governance Indicators (WGI) database (and/or other "subjective" survey measures).[22] I regard both as less appropriate for different reasons.

Although taxation can be seen as a necessary condition for all functions states conduct (Wang and Hu 2015; Levi 1989; Hendrix 2010), it is not clear how tax extraction in itself can be used as a valid measure of state capacity. First, many type of taxes do not require much state capacity to extract, while the type of taxes that do require extensive monitoring and enforcement throughout the states' territory (i.e. income, profit, capital, and property tax) are likely to be endogenous to economic development (once countries grow richer these type of tax bases are likely to increase disproportionally relative to GDP). Second, and more importantly, tax extraction is likely to be a highly imprecise measure of state capacity given that increases in tax extraction on higher levels of extraction probably reflect more ideological choices than real increases in capacity (Fukuyama 2013; Hanson and Sigman 2013; Soifer 2012; Ottervik 2013).[23] This type of measurement error is not random rendering regression

[21]Examples of studies on state capacity which employ (total or direct) taxation as a percentage of GDP as a measure of state capacity are: Lieberman (2002), Fukuyama (2004), Harbers (2015), Dincecco and Prado (2012), and Dincecco and Katz (2016).

[22]Examples of studies on state capacity which employ the WGI's "government effectiveness" variable are: Rothstein (2011), Jalilian, Kirkpatrick and Parker (2007), Helliwell and Huang (2008), Halleröd et al. (2013), and Charron and Lapuente (2010).

[23]For example, according to the IMF tax database the United States extracted 15.18% of GDP in income, profit, capital, and property tax in the year 2014. This level of tax extraction is approximately the same as that of South Africa (15.67%) and less than half of Denmark (35.08%), in the same year. I regard it as highly doubtful that any political economist would find it likely that the United States has a level of state capacity that is less than half of Denmark and similar to that of South Africa. Rather it seems more likely that the United States simply *chooses* to extract less (of these type of) taxes while this should not be taken to suggest that it would not have the capacity to do so.

coefficients invalid (even in instrumental variable models).[24]

The World Governance Indicators (WGI) database provides a measure of "government effectiveness" generated by combining a large number of existing survey variables. This data is available for the period from 1996 to 2016. Although commonly used as a measure of state capacity it suffers from several important measurement validity issues.[25] First, it measures many other things besides state capacity. It includes measures of policy stability and whether the bureaucracy is able to avoid more "political" control over monetary policy. In addition, it includes variables that are more related to the content, rather than the enforcement, of public policy (e.g. whether governments are likely to introduce more employment or environmental regulations, local content requirements, import/export barriers, tariffs, quotas, price controls, or are otherwise more likely to intervene into the operations and decisions of private companies). Second, it takes "public service" outcomes in area's such as health, education, and sanitation as measures of state capacity while these outcomes are very likely to be influenced by other factors, besides state capacity, as well (Fukuyama 2013). Third, many of the survey variables used to create the index are based on asking respondents to rate their country's score on variable X *in general*, rather than asking respondents to rate their state's performance with regard to specific situations were they are likely to have first-hand experience in. This is problematic given that it is not clear whether people in different countries are defining concepts as "bureaucracy", "corruption", "public goods provision", etc., the same (Fukuyama 2013). Furthermore, this approach is likely to increase the probability that the answers of respondents are (partly) influenced by their country's past/recent economic performance.[26] Other survey measures that partly touch on the concept

[24]Nonetheless my measure of state capacity is relatively strongly correlated with income, profit, capital, and property tax as a percentage of GDP in 2014 (Pearson r: 0.684; P-value: 0.000). The data comes from the IMF tax database. If missing, values are inputed, first from earlier years since 2000 within the IMF database, and otherwise from the OECD tax database.

[25]Note that most of these concerns have been expressed before. See for example: Kurtz and Schrank (2007) and Thomas (2010).

[26]On the econometric level the WGI data does also not provide much advantages over the WJP data given

of state capacity tend to suffer from many of the same problems highlighted above.[27]

Measurement of instrument

I attempt to alleviate endogeneity concerns by instrumenting state capacity by exposure to premodern warfare. This empirical approach is based on the idea that exposure to premodern (inter-state) warfare is an important historical cause of current levels of state capacity[28], while being plausibly unrelated to economic development through channels other than state capacity. I argue for the validity of these assumptions extensively below. Here I discuss how I measure exposure to premodern warfare.

There are four important, and arguably arbitrary, choices to be made with regard to the construction of any exposure to premodern warfare instrument. First, how to measure the degree of "exposure" (e.g. by years or money spend fighting wars, or by soldiers employed and killed during warfare activities). Second, which time period to consider. Third, how to deal with current countries that have, perhaps for reasons that are endogenous to (historic) political-economic development, not (consistently) existed since the time period considered. And last, whether, and if so how, to normalize exposure to premodern warfare (i.e. acknowledging that the same level of exposure can have very different effects in small versus large countries).

Partly as a results of serious data limitations I choose to measure exposure to premodern

that its data is not available for before 1995 so that the over time data contains too little variation regarding the generally slow-moving process of institutional change to use country fixed effects.

[27]Perhaps most notably among these are: the Centre of Systemic Peace's "State Fragility" and "State Effectiveness" Indexes, The Economist Intelligence Unit's "Functioning of Government" indicator, and International Country Risk Guide's "Quality of Government" and "Bureaucracy Quality" variables. Note further that measures of corruption/impartiality are also no clear measures of state capacity because although corruption is clearly *one* cause of low state capacity it is far from the only one (Soifer and Vom Hau 2008).

[28]A well-known qualitative-historical literature on state building suggests that the thread of warfare and foreign occupation lead to societies that were more willing to accept the huge losses in freedom and equality that are associated with the transition of tribal polities to centralized states, and, more importantly, tended to get political elites serious about developing the broad bureaucratic capacities necessary to effectively tax, enforce rules, monitor populations and property, coordinate economic behavior, and provide public goods, so as to grow the economy and produce the resources necessary to sustain a large army (Fukuyama 2014; Tilly 1975, 1990). In line with this I indeed find a moderate positive relationship between war causalities per sq. km from 1700 to 1789 and state capacity today (Pearson r: 0.395; P-value: 0.001).

warfare by war causalities per sq. km from 1700 to 1789. This data is collected by Dincecco and Prado (2012) using the statistical encyclopedia on historical warfare of Clodfelter (2002). I elaborate on this choice in the next four paragraphs.

I choose to measure exposure to warfare by causalities sustained in inter-state warfare for two reasons. First, data on war causalities is relatively precise and available for a large group of countries over a relatively long period of time.[29] This is in contrast to data on war expenditure and soldiers deployed which is not systematically available for many country-years and, in the case of expenditure, is not necessarily directly comparable across countries. Second, although years in warfare could be used as an alternative measure of exposure to warfare this variable tends to hide very large differences in the scope of warfare (Dincecco and Prado 2012).

I choose to focus on the time period from 1700 to 1789 for two reasons. First, data on war causalities from before 1700 is missing outside of Europe. This is both the case in Clodfelter (2002) as well as in other sources that provide historical data on war causalities (such as: Messenger (2001) and Bradford (2006)). Second, including data on war causalities from after 1789 would reduce the plausibility of the exclusion restriction were my empirical strategy relies upon. Including data from after 1789 would, for example, increase the probability of reversed causality (i.e. economic developing causing exposure to warfare and state capacity), which is less likely when including only data from before 1789 given that levels of economic development primarily started to diverge on a dramatic scale as a result of the European Industrial Revolutions that (predominately) occurred after 1789. Including data from after 1789 could also increase the probability that exposure to premodern warfare has subtly influenced current levels of economic development through other type of political institutions (i.e. democracy and checks and balances) which have primarily been introduced after, and

[29]Data on war causalities (even so far back in time) is relatively precise because states had a direct interest in monitoring their loss of military manpower in events of war.

sometimes a results of, the French Revolution in 1799.[30]

Ultimately there is no completely satisfying solution to the problem that some countries have not consistently existed from 1700 to today, and that the reason for this fact may in some cases be endogenous to warfare and historic differences in political-economic development. I nonetheless try to alleviate the concern that my results are driven by endogenous borders in three ways. First, I add continental fixed effects (including for Africa which borders were set completely endogenous by European powers at the end of the 19$^{\text{th}}$ century). Second, I control for whether a current country was ever colonized (by a European country). Last, I control for a dummy that takes the value 1 if a current country did not already exist in 1700 and a dummy that takes the value 1 if the birders if a current country have significantly changed as compared to the international borders of 1700. Both dummies are generated by overlaying a historical world map with the world map of today.[31]

I follow Dincecco and Prado (2012) by normalizing the absolute number of war causalities from 1700 to 1789 by *current* territory size for two reasons. First, given that the mechanism through which more exposure to premodern warfare is expected to generate higher levels of state capacity is contingent upon the extent to which societies and elites are incentivized to centralize power and invest in law enforcement capacity, and because this incentive is very likely to be significantly stronger when a bigger part of society is exposed to the direct effects of warfare, I believe one should normalize the absolute number of war causalities variable.[32] Second, I choose to normalize relative to current territory size rather than to historic or current population size, or historic territory size, because historic population and territory

[30]I nonetheless re-estimate the main IV model with war causalities per sq. km. from 1815 to 1913 (data which is also provided by Dincecco and Prado (2012)), and find similar results. Note, however, that in this specification the first-stage is weak with a coefficient of 0.406, a p-value of 0.068, and a corresponding F-statistic of the excluded instrument of 3.45. The second-stage coefficient in this specification is nonetheless 0.600 with a corresponding p-value of 0.000.

[31]This leaves the results unchanged (results available on request).

[32]Note, however, that the results also hold without normalization. The first stage in this specification is 0.442 (P-value: 0.001; F-statistic of excluded instrument: 11.86), with a corresponding second stage of 0.594 (P-value: 0.000).

data is missing for most country-years, and because net changes in population size have been much larger than net changes in territory size since 1789.[33]

Measurement of causal mechanisms

In my empirical strategy I also model the causal mechanisms through which I expect state capacity to affect economic development (law and order, infrastructure- and education quality, and technological innovation). I include the crime control index of the 2014 Hertie Governance Indicators Report to measure the degree to which a state is able to maintain law and order. This index quantifies to what extent businesses incur significant costs as the result of burglary, homicide, robbery, and other crime, and to what extent crime and violence is effectively controlled in general. I measure the quality of education through the education provision index of the 2014 Hertie Governance Indicators Report. This measure includes a country's average score at cross-country standardized tests, the salary of teachers relative to GDP per capita, the gross enrollment in primary and secondary education, and the quality and coverage of higher/university education and public schooling. I measure the quality of overall infrastructure using survey data from the World Economic Forum which asks respondents how they would assess the quality of transport, telephony, and energy infrastructure in their country on a scale from zero to seven. Last, I measure the level of technological advancement in each country through data on labor productivity per hour worked, from the Total Economy Database. Acknowledging that higher labor productivity per hour can also come, besides more efficient technology, from more capital input I control for capital stock per hour worked (PPP). This data also comes from the Total Economy Database.

Table 1 reports summary statistics of all main variables of interest. Please see appendices

[33]Nonetheless the results also hold when normalizing using current population sizes. Note, however, that in this specification the first-stage is weak with a coefficient of 0.107, a p-value of 0.248, and a corresponding F-statistic of 1.36. The second-stage coefficient in this specification is nonetheless 0.836 with a corresponding p-value of 0.017.

B and C for the measurement and descriptive statistics of all control variables.

Table 1: Summary statistics of main variables.

	Mean	**Std. Dev.**	**Min.**	**Max.**	**N**
Log GDP per capita, PPP	9.307	1.094	6.664	11.277	95
Effective enforcement	5.312	1.439	2.836	8.724	95
War causalities per sq. km (1700-1788)	0.268	0.623	0	3.360	66
Crime control	1.701	0.701	0	3.523	95
Quality education	1.996	0.735	0	3.152	95
Quality infrastructure	4.294	1.076	2.279	6.429	89
Labor productivity per hour	34.502	21.376	2.185	89.289	49

Note: See appendix A for datasources and coding for variables reported in table 1. See appendices B and C for the datasources, coding, and summary statistics of control variables.

Ordinary Least Squares Estimates

Figure 1 depicts the relationship between state capacity and economic development in a scatter plot. As expected the association is strongly positive, meaning that higher levels of state capacity tend to come together with higher levels of economic development.[34]

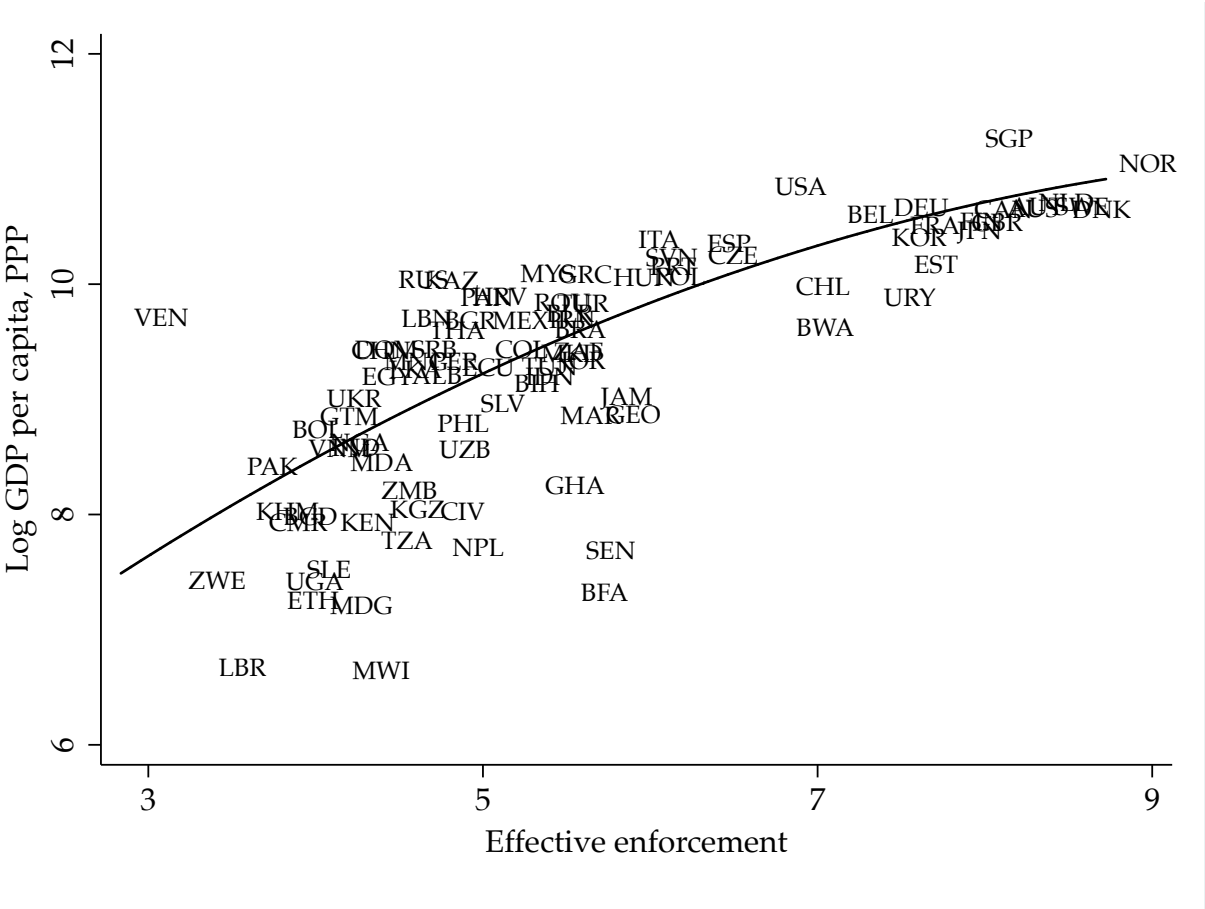
To study this relationship more precisely I regress GDP per capita, PPP on state capacity while controlling for a host of potentially confounding variables (see table 2). The results are for ordinary least squares (OLS) regressions of the following form:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_5 \delta_i + \epsilon_i \tag{1}$$

Where Y is the natural log of GDP per capita, PPP, X is the level of state capacity, and

[34]Below the regression line on the low-side of the effective enforcement scale there are two notable outliers with potential leverage on the overall regression coefficient (Liberia and Malawi). These two countries' development levels are substantially lower than what one would expect based on their level of state capacity. It remains a topic for future research what generates this diversion. However, given that outliers on the high- and low-side of the X-axis can have substantial influence on regression coefficients I replicate the main results reported in table 2 using robust- and median regression, and when omitting these two countries. This leaves the interpretation of results unchanged. Furthermore I replicate all models including a quadratic term to take into account the slight non-linearity in the data, but find a linear functional form to be best fitting in all cases. All these results are available on request.

Figure 1: Scatter plot of relationship between state capacity and economic development.



Note: GDP data comes from the World Development Indicators database, and refers to the year 2014. Effective enforcement as measured by the World Justice Project, in the year 2014. See appendix A for detailed data description.

δ is a vector of control variables, in country i. To the main models I add control variables that could be correlated with both state capacity *and* economic development (since only these can confound the relationship between state capacity and economic development), such as: constraints on the executive, (electoral) democracy, identity colonizer (if any), legal origin, ethnic fractionalization, and social capital. ϵ is a standard error term which is, in this specification, assumed to be independently distributed from all regressors with a mean of 0.

The estimates in table 2 suggest that a one unit increase in the effectiveness of enforcement

(measured on an 11-point scale, higher values indicating more effective enforcement) is, on average, associated with a between 0.448 and 0.517 increase in the log of GDP per capita PPP, holding all other variables constant. This effect resembles a, ceteris paribus, 57 to 68 percent increase in GDP per capita PPP with each additional unit increase in effective enforcement. In its most conservative estimate this is roughly equal to a relative increase in income from the level of Chile ($21.980) to the level of the United States ($52.118), in 2014, with every two scale points (i.e. 18.2%) increase in state capacity. The effect of effective enforcement is statistically significant at the 1% confidence level and changes little after incorporating control variables.[35] Effective enforcement alone explains approximately 57 percent of all differences in income levels between the 95 countries included in the sample.

It furthermore becomes evident from table 2 that the effect of state capacity on economic development far exceeds the effect size of (electoral) democracy and checks and balances institutions. The effect of only a one unit increase in effective enforcement is more than 4 times as large as a full shift from a (relatively) unconstrained executive to a maximally constrained executive and almost 2 times as large as having regular competitive elections rather than no or non-competitive elections.[36] This suggests that institutions that generate state capacity are potentially (much) more important for economic development than the accountability generating institutions which are emphasized in much of the existing growth literature.

[35]Note, however, that not all models have the same amount of observations, so that, strictly speaking, coefficients cannot be compared directly across models.

[36]To more precisely contrast the effect of institutions that generate state capacity with institutions that provide checks and balances I compare the (unstandardized) effect of "effective enforcement" with the (unstandardized) effect of the "constraints on the government" indicator of the World Justice Project (both are measured on the same 11-point scale). WJP's constraints on the government variable measures to what extent government powers are effectively limited by the legislature, the judiciary, independent auditing and review, and other non-governmental checks, to what extent government officials are sanctioned for misconduct, and to what extent the transition of power is subject to the law. Its bivariate effect on log GDP per capita PPP is 0.411 (P-value: 0.000). After controlling for state capacity its coefficient is *negative* and statistically insignificant (Coefficient: -0.128; P-value: 0.248). The effect of state capacity is 0.705 (P-value: 0.000) after controlling for this measure of institutional checks and balances.

Table 2: Economic development regressed on state capacity.

	(1)	(2)	(3)	(4)	(5)	(6)
Effective enforcement	0.576***	0.507***	0.448***	0.517***	0.460***	0.479***
	(0.045)	(0.054)	(0.072)	(0.072)	(0.059)	(0.062)
Constraints on executive		0.126				
		(0.180)				
Electoral democracy		0.257				
		(0.213)				
Latitude			0.014*			
			(0.006)			
Landlocked			-0.741**			
			(0.240)			
French legal origin				0.162		
				(0.176)		
British ex-colony				-0.411		
				(0.257)		
French ex-colony				-0.895**		
				(0.326)		
Other ex-colony				0.000		
				(0.227)		
Ethnic fractionalization					-0.013***	
					(0.003)	
Social capital						0.003
						(0.005)
Constant	6.248***	6.411***	6.633***	6.677***	7.426***	6.814***
	(0.283)	(0.302)	(0.327)	(0.536)	(0.427)	(0.322)
Observations	95	92	78	78	94	73
Adjusted R-squared	0.570	0.566	0.656	0.646	0.637	0.582

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis), in the year 2014 (from the World Development Indicators database). Effective enforcement as measured by the World Justice Project. See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

The effect of state capacity on economic development is also substantially larger than all other commonly proposed explanations for economic development studied in table 2 (see regression with coefficients standardized using Z-scores in appendix D table 13). The standardized effect of state capacity is, for example, almost 3 times as large as the standardized effect of latitude, about 2 times as large as the standardized effect of ethnic fractionalism, and more than 12 times as large as the standardized effect of social capital. Only a one standard deviation increase in effective enforcement comes close to the full effect of being landlocked or being a French ex-colony. This suggests that state capacity is potentially a more important cause of economic development than many alternative explanations put forward in the existing literature.[37]

I perform several robustness checks to assess the sensitivity of these results. First, I control for all omitted variables that vary across (developing) regions and income levels by adding regional fixed effects for Asia, Sub-Sahara Africa, South-America, and including a highly developed country fixed effect in the form of a dummy that takes the value 1 if country i is a country that became member of the OECD before 1990, and 0 otherwise. This leaves the results unchanged (Coefficient: 0.420; P-value: 0.000). Second, I control for an additional 93 plausibly confounding variables, and find that the results hold (results available on request).[38]

[37]Note that the standardized effect of state capacity is also larger than the standardized bivariate (non-mediated) effect of all alternative explanations studied in table 2.

[38]Using data from a large number of sources brought together in the Quality of Government Institute's "Standard Dataset" (Teorell et al. 2017), I find that the association between state capacity and economic development holds (at least on the 5% confidence level, and almost always above the 1% level, with a coefficient typically above 0.500) when controlling for (alternative) operationalizations of: the rule of law, independence of the judiciary, corruption, accountability, transparency, the quality and impartiality of (basic) civil service, the overall functioning of government, government- and elite fractionalization, amount of political veto players, regime failure, ethnic, religious, linguistic and cultural fractionalization, civil society participation and traditions, urbanization and population density, terrain and climate characteristics, percentage of population that is secular or member of one of the seven largest religious denominations, (the intensity of) civil, ethnic, inter- and intra state conflict, political stability and turnover rates of governments/executives, the extent of separation of power and checks and balances in the political system, the influence of military and religious actors in politics, natural resource rents (as a % of GDP), Nunn's measures of historic slave trade experiences, the "quality" (content-wise) of governmental regulations, the burden of government regulation on businesses and, last, official incoming IDA (as a % of GDP).

Third, I use the technique developed by Bellows and Miguel (2009) to estimate how strong selection on omitted variables, relative to observed control variables, must be to explain away the full effect of state capacity.[39] I find that the effect of such (an) omitted variable(s) should be approximately 4 times larger than the effect of the strongest observed control variable (i.e. ethnic fractionalization) and more than 2 times larger than the cumulative effect of all statistically significant control variables in table 2 *together*. I regard it as unlikely that (a) factor(s) of that size exists outside of the more than 100 variables I have already controlled for here. Last, I examine whether the results change when measuring economic development by the Human Development Index or child mortality rates. I here find similar, if not stronger, effects of state capacity (see appendix E).

To examine through which causal mechanisms state capacity affects economic development I start by estimating OLS regression models of the following form:

$$Y_i = \beta_0 + \beta_1 X_i + \beta_2 L_i + \beta_3 E_i + \beta_4 I_i + \beta_5 T_i + \epsilon_i \tag{2}$$

Here I regress log GDP per capita, PPP on state capacity while adding four mediating variables: law and order (L), quality of education (E), public infrastructure quality (I), and technology levels (T). Given that I expect state capacity to affect economic development through each causal mechanism, I expect β_1 to decrease significantly with the inclusion of each individual mediating factor, and to get reduced, to a coefficient close to zero, when including all mediating variables at the same time.[40]

[39] This ratio is generated by estimating the following equation: $\beta_c/(\beta_b - \beta_c)$. Where β_c represents the regression coefficient of interest after controlling for plausible confounding variables that are observed, and β_b is the bivariate regression coefficient. One thus divides the effect remaining after controls, by the amount of the original uncontrolled effect reduced due to the inclusion of controls.

[40] My empirical strategy at this stage consists simply of adding each proposed causal mechanism to the bivariate regression and interpreting changes in the effective enforcement coefficient. Given that state capacity cannot be considered as exogenous this approach rests on two assumptions. First, causal effects flow (predominantly) from effective enforcement to the mediating variables and subsequently on economic development, rather than that the variables are related in any other order. Second, there are no omitted variables that simultaneously determine state capacity, the causal mechanisms, and economic development

Table 3 reports the results of the mediation models. The results are as expected: (1) all mediating variables do individual "work" and enter the equation in the expected direction; and (2) all mediating variables are "needed" to reduce the effect of state capacity to a coefficient that is close to zero and statistically insignificant.[41]

Table 3: Mediation analysis.

	(1)	(2)	(3)	(4)	(5)
Effective enforcement	0.437***	0.359***	0.279***	0.127**	0.063
	(0.062)	(0.060)	(0.069)	(0.053)	(0.056)
Crime control	0.379***				-0.002
	(0.138)				(0.142)
Quality education		0.652***			0.411***
		(0.121)			(0.141)
Quality infrastructure			0.473***		0.081
			(0.113)		(0.077)
Labor productivity per hour				0.025***	0.016***
				(0.004)	(0.004)
Constant	7.022***	7.382***	5.834***	8.313***	8.486***
	(0.367)	(0.339)	(0.347)	(0.268)	(0.408)
Proportion mediated	0.242***	0.376***	0.495***	0.693***	0.847***
Observations	95	95	89	49	48
Adjusted R-squared	0.591	0.678	0.638	0.831	0.865

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis), in the year 2014 (from the World Development Indicators database). Effective enforcement as measured by the World Justice Project. See appendixes A and B for detailed data description. Proportion mediated and p-values are of a Sabel-Goodman mediation test.
$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

In order to asses more precisely the association between state capacity and the mecha-

rendering OLS estimates spurious. I deal with most of these problems later in this paper by employing three-stage least squares (3SLS) regression models using causalities of inter-state warfare from 1700 to 1789 as an instrument for current levels of state capacity in the first stage. Although this design is unable to establish whether the causal mechanisms described above are cause or effect of economic development the results do provide evidence that state capacity is indeed an important cause of economic development and each individual causal mechanism.

[41]Model (5) in table 3 suggests that only the effects of education quality and labor productivity per hour worked remain significant when effective enforcement and all other causal mechanisms are added to one regression model. Note, however, that this should not (necessarily) be interpreted as evidence for a lack of independent effect of law and order and overall infrastructure quality, since crime control and better infrastructure are likely to affect economic development through higher labor productivity per hour worked.

nisms through which it may affect economic development I regresses each individual causal mechanism on effective enforcement. To test the hypothesis that political institutions meant to hold executive power accountable are unlikely to (in themselves) alleviate market failures I control in all regressions for constraints on the executive and (electoral) democracy.[42] In addition, I add proxies for investment to see if the positive effect of state capacity goes beyond simply more (physical) investment in law and order, education, infrastructure, and technology.[43] The results are reported in table 4.

I find that (electoral) democracy is in fact negatively associated with law and order, education- and infrastructure quality, and labor productivity per hour worked, after controlling for state capacity and investment. Constraints on the executive is positively (but statistically insignificantly) associated with all four causal mechanisms. The results are thus strongly in line with the idea that enforcing law and order, and increasing educational, infrastructural, and technological capabilities is prone to severe market failures, market failures which are unlikely to be alleviated by merely constraining executive state power through institutional checks and balances and competitive multi-party elections.

With regard to the effect of state capacity the model estimates that a one unit increase in effective enforcement (which is measured on an 11-point scale) leads, on average, to a 0.309 reduction in costs incurred by businesses and citizens as a result of crime (which ranges from 0 to 3.5 in the sample), to a 0.309 increase in the quality of education (which ranges from 0 to 3.2 in the sample), and a 0.361 increase in the perceived quality of public infrastructure (which is measured on an 7-point scale), holding all other variables constant. Interestingly, in all three cases the effect of investment per capita is small and statistically insignificant after controlling for state capacity. This indicates that when comparing countries with equal levels of state capacity simply investing more in police, education, and infrastructure does

[42]Note that the results do not change when omitting these two variables.

[43]Note that data on police expenditure per capita is unavailable in cross-country settings. I therefore proxy investment in law and order by police officers per 100,000 inhabitants.

Table 4: Causal mechanisms regressed on state capacity.

	(1) Crime Control	(2) Quality Education	(3) Quality Infrastructure	(4) Labor Productivity
Effective enforcement	0.309***	0.309***	0.361*	3.187*
	(0.037)	(0.083)	(0.155)	(1.462)
Constraints on executive	0.397	0.253	0.015	1.665
	(0.218)	(0.164)	(0.244)	(2.785)
Electoral democracy	-0.660*	-0.050	-0.105	-5.524
	(0.260)	(0.197)	(0.234)	(3.016)
Police officers	-0.009			
(per 1,000 inhabitants)	(0.040)			
Education expenditure		0.003		
(Units of $100, per capita)		(0.009)		
Infrastructure expenditure			0.057	
(Units of $100, per capita)			(0.150)	
R&D expenditure				6.163
(Units of $100, per capita)				(3.883)
Capital stock, PPP				2.004***
(Units of $10, per hour worked)				(0.277)
Constant	-1.369***	-1.738***	2.207**	0.964
	(0.203)	(0.380)	(0.640)	(7.729)
Observations	48	65	48	39
Adjusted R-squared	0.619	0.567	0.150	0.861

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in each regression is displayed in the column heading. Effective enforcement as measured by the World Justice Project. See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

not improve outputs significantly.[44] This may suggest that, at least past a certain threshold, improving crime control and raising the quality of education and infrastructure is more about increasing the effectiveness by which existing (public) investment is allocated and regulated, rather than (merely) increasing physical investment itself.

Importantly, technology levels, as measured by labor productivity per hour worked, is also significantly and strongly associated with state capacity. The model estimates, when controlling for the value of capital stock per hour worked (PPP), that a one unit increase in effective enforcement leads, on average, to a $3.19 increase in output per hour (in PPP-terms). Again I find that more investment per capita (in research and development) is not associated with higher levels of labor productivity after controlling for state capacity. Examining the relationship between state capacity and technological advancement further I find that countries with higher levels of state capacity make significantly more (private and public) R&D investments (US$) per capita (Coefficient: 331.58; P-value: 0.000), employ more R&D researchers per 1,000 inhabitants (Coefficient: 0.867; P-value: 0.002), and have firms that, according to World Economic Forum survey data, have higher capacities to innovate (Coefficient: 0.291; P-value: 0.000), even at similar levels of development (i.e. when controlling for the natural log of GDP per capita in PPP-terms) (results available on request). The results therefore suggest that state capacity affects economic performance directly through fostering technological advancement, which, as is well known, is necessary to sustain economic growth close to the technological frontier, and is the strongest determinant of long-run growth rates (Solow 1956, 1957).

In sum, the OLS estimates suggest that: (1) the effect of state capacity on economic development is large, and highly robust to an extensive range of controls and alternative specifications; (2) state capacity has a much stronger effect on economic development than

[44] That is assuming that more police officers per 100,000 inhabitants and higher levels of education and infrastructure investment do not in themselves lead to more state capacity.

(electoral) democracy and checks and balances institutions do; (3) state capacity also has a substantially stronger effect than other prominent explanations for cross-country differences in economic development, such as: latitude, landlockedness, ethnic fractionalization, legal origins, social capital, and others; (4) the mechanisms through which state capacity is associated with economic development are: law and order, higher quality education and -infrastructure, and higher levels of technological advancement; and (5) these causal mechanisms are much more strongly determined by state capacity than by physical investment, (electoral) democracy, or institutional checks and balances.

Instrumental Variable Estimates

I now turn to three important threats to the validity of these OLS estimates. First, the question of institutional sequencing (i.e. whether (electoral) democracy and checks and balances institutions come prior in the causal process and cause economic development through enhancing state capacity). If it is true that state capacity is generally enhanced by introducing institutional checks and balances and/or (electoral) democracy the previously found "independent effects" of state capacity on economic development should actually be seen as simply mediating the effect of these type of institutions on economic development.[45]

[45]It is important to note, however, that checks and balances and (electoral) democracy have, almost without exception, been institutionalized only *after* countries industrialized. Based on Polity IV's constraints on the executive data one can say that: (1) in all cases of development success in the 19th century (Western Europe, the United States, Canada, and New Zealand), with the possible exception of England and the United States, substantial constraints on the executive (as indicated by category 6 or 7) were institutionalized at the end of the 19th or beginning of the 20th century, well *after* the Industrial Revolution had taken place in these countries (note also that in the cases of England and United States one should strongly doubt the Polity IV coding based on the available qualitative-historical evidence); and (2) in all cases of development success in the 20th century, with the possible exception of Japan, substantial constraints on the executive also came after economic development (South Korea and Taiwan) or did not institutionalize at all (China, Singapore, and Hong Kong) (van Noort 2017). With regard to democracy the historical evidence is even more clear. In no country throughout the 19th and beginning of the 20th century had ever a majority of the population voting rights (women were always excluded, non-property owners and non-whites were generally excluded). The first country to introduce universal suffrage was Norway in 1913, most currently rich countries did so only after the Second World War (approximately a century after the Industrial Revolution) (Chang 2002). Similarly, none of the "East Asian Miracle" countries held free and fair multi-party elections during

Second, the question of reversed causality (i.e. development causing state capacity rather than vice versa). Higher income levels might, for example, increase state capacity by increasing public financial resources, reducing incentives for corruption, creating more demand for effective enforcement, or by producing more capable government officials. Third, the question of confounding (i.e. omitted variables that simultaneously cause state capacity and economic development). Although I have found the association between state capacity and economic development to be unaffected by over 100 control variables, one cannot conclude, given that much of what determines state capacity and economic development is still unknown, that all relevant confounding factors have been taken into account. I attempt to alleviate these three concerns by employing instrumental variable regression models.

The Instrument's Validity

As an instrument for current levels of state capacity I follow Dincecco and Prado (2012) by using causalities in inter-state wars (per sq. km) from 1700 to 1789. The logic is here that inter-state warfare has historically played an important role in establishing centralized and effective states (see, for example, the work of Fukuyama (2014) and Tilly (1975, 1990)), while it is unlikely to have affected current levels of income through factors other than state capacity.

More specifically, the identifying assumption is that: (1) exposure to premodern warfare was not itself determined by prior levels of economic development or state capacity, and current levels of income and premodern exposure to warfare are not simultaneously determined by an unobserved confounding variable; and (2) exposure to premodern warfare is *only* associated with current levels of economic performance through its effect on state capacity. I argue that this identifying assumption is plausible for three reasons.

their economic take-off. South Korea's first free and fair election was in 1988 (25 years after growth took off in 1963), Taiwan's first direct presidential election took place in 1996 (44 years after growth took off in 1952). Singapore, Hong Kong, and China do still not hold free and fair elections.

First, there is little evidence that suggests that countries before 1790 selected into war with reference to their own level of state capacity or economic development. Economic historians have found that the capacity to extract taxes (or the lack thereof) did not significantly affect monarchial decisions to select into warfare. Instead the role of monarchial glory and reputation, together with an incentive structure that created monarchial moral hazard, played a decisive role. Hoffman (2012), for example, argues that:

> "[...] leaders making decisions about war [...] stood to win a disproportionate share of the spoils from victory but avoided a full share of the costs. They – not their subjects – were the ones who basked in glory or who burnished their military reputations when their armies were victorious. But they bore few of the costs, which fell disproportionately on their subjects." (p. 605)

> "[And] although the kings might lose small amounts territory themselves, they faced no major downside risk to their thrones, at least in the larger states, for loss in battle in anything but a civil war never toppled a major monarch from his throne, at least in the years 1500–1790." (p. 604)

The statistical evidence in table 5 confirms these qualitative-historical findings by instrumenting state capacity with exposure to premodern warfare while controlling for the level of stateness, GDP per capita, urbanization, and population density in the year 1700.

To further exclude the possibility that the IV results presented below are driven by self-selection into warfare by states that were economically-, politically-, and/or military powerful in the 18$^{\text{th}}$ century I control for current countries that were "great powers" in the 18$^{\text{th}}$ century[46], countries that were "aggressors" in at least one 18$^{\text{th}}$ century war[47], and countries that were "solely attacked" by other countries throughout the 1700 to 1789 period

[46]The following countries are coded as "great powers" in the 18$^{\text{th}}$ century: the Habsburg Empire coded as modern Austria, Prussia coded as modern Germany, Russia, the United Kingdom, and France.

[47]In addition to the "great powers" Sweden, Denmark, and Norway are coded as "aggressors".

Table 5: Controls for 1700 levels of stateness and economic development.

	(1)	(2)	(3)	(4)
Panel A: Log GDP per capita, PPP (second stage)				
Effective enforcement	0.548***	0.310***	0.477***	0.529***
	(0.125)	(0.038)	(0.081)	(0.097)
Stateness, 1700	0.005			
	(0.005)			
Log GDP per capita, 1700		0.029		
		(0.037)		
Urbanization, 1700			-0.003	
			(0.010)	
Population density, 1700				-0.001
				(0.001)
Panel B: Effective enforcement (first stage)				
War causalities per sq. km	0.851**	0.815**	1.139**	0.916**
	(0.263)	(0.261)	(0.388)	(0.296)
Controls first stage	YES	YES	YES	YES
F-statistic	10.49**	9.78**	8.62**	9.57**
Observations	65	25	42	55
Adjusted R-squared	0.097	0.156	0.115	0.111

Note: All regressions are 2SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendix A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

Table 6: Controls for self-selection into 1700-1789 warfare.

	(1)	(2)	(3)	(4)
Panel A: Log GDP per capita, PPP (second stage)				
Effective enforcement	0.544***	0.611**	0.563***	0.558***
	(0.121)	(0.196)	(0.096)	(0.093)
Great power	0.067			
	(0.347)			
Main aggressors		-0.286		
		(0.541)		
Solely attacked			0.284	
			(0.158)	
Solely attacked				0.313**
(Excl. India and Thailand)				(0.110)
Panel B: Effective enforcement (first stage)				
War causalities per sq. km	0.818**	0.606*	0.918***	0.934***
(1700-1788)	(0.253)	(0.238)	(0.252)	(0.252)
Controls first stage	YES	YES	YES	YES
F-statistic	10.47**	6.50*	13.24***	13.71***
Observations	66	66	66	66
Adjusted R-squared	0.147	0.264	0.147	0.131

Note: All regressions are 2SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description. The following countries are coded as "great powers" of the 18$^{\text{th}}$ century: the Habsburg Empire coded as modern Austria, Prussia coded as modern Germany, Russia, the United Kingdom, and France. Sweden, Denmark, and Norway and all "great powers" are coded as "aggressors". Belarus, Poland, Romania, Ukraine, Thailand, and India are coded as countries that were "solely attacked" by other countries in the 1700 to 1789 period.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

(i.e. those countries that did not self-select into warfare during this period).[48] This leaves the results unchanged (see table 6).

[48]I here include the countries that were during the 1700 to 1789 period subject to successive raids and/or occupation by Russia, Sweden, the Habsburg Empire, and Prussia due to the collapse of the Polish-Lithuanian Commonwealth after the Great Northern War (1700-1721) and the War of Polish Succession (1733-35) (i.e. Belarus, Poland, Romania, and Ukraine). I also include Thailand (invaded by Burma) and India (invasion of Maratha's and Afghans under Mughal rule). Thailand and India are borderline cases, however, because the military leader Taksin managed to defeat the Burmese occupation shortly after and eventually drove Burmese troops out of Siam in 1790 and the Maratha's (after taking over rule in most of India) successfully fought-of invading forces of the King of Afghanistan in the Third Battle of Panipat (1761). The results also hold when excluding these two cases (see table 6 model (4)).

Second, the results are highly robust to geographical control variables that are potentially associated with historical warfare while still affecting economic development today. The literature on inter-state warfare and state building suggests that the reason why some countries have historically been more or less exposed to warfare are primarily geographical in nature. Fukuyama (2014: 390) argues that:

> "Certain topographies were better suited to the raising and deployment of large armies. In Eurasia (China and Russia primarily), relatively open land encouraged consolidation of large centralized states, while in sub-Saharan Africa, the difficulties of projecting power across vast deserts and tropical forests inhibited state formation. Europe was somewhere in between: its geography encouraged the formation of medium-sized political units, but it prevented any one of them from growing to a size that allowed conquest of the entire region. Latin America's geography put it closer to sub-Saharan Africa than to Europe. The continent as a whole was divided by mountains, jungles, and deserts, and by the prevailing north-south lines of communications, into mutually inaccessible regions that did not facilitate the creation of large territorial empires."

Factors that were of particular importance where the degree to which the topography provided natural barriers to invasion (i.e. mountains, deserts, tropical rainforests), the degree to which the soil and climate could sustain reasonably high population densities, and the extent to which the geography provided opportunities for circumvention of the population (Tilly 1975; Fukuyama 2014; Herbst 2000). Given that geography is an exogenous variable I am able to control for it in the first stage. I do so by controlling for: terrain ruggedness, territory size, the percentage of territory covered by desert and tropic rainforest, the percentage of soil that is very or moderately suitable for agriculture, the percentage of soil that is very or moderately suitable for irrigation, the mean distance to the closest river, and the mean

distance to the closest coast.[49] In addition, I add fixed effects for Europe, South America, Asia, and Africa. This leaves the results reported below unchanged (see table 7).

Third, exposure to premodern warfare is unlikely to have affected economic development directly or through other types of political institutions. The effect of exposure to premodern warfare on current levels of income is unlikely to be direct because a larger diversion of resources towards war efforts should, in the absence of a counterbalancing effect of institutional change, be expected to *lower*, rather than raise, the supply of labor and capital and the efficiency in which they are combined to add value in production (i.e. the commonly called "proximate causes" of development).[50] This leaves open the possibility that higher exposure to premodern warfare has affected economic development through other institutional factors. Although the higher demand for tax extraction by states that were more exposed to war could in principle have led to more popular demands for institutions that constrain executive state power through elections and/or checks and balances this is not supported by: (1) the fact that these institutions have generally be introduced long after 1789 (see footnote 40); (2) the regression evidence in table 8 which finds that institutional checks and balances and (electoral) democracy do not mediate (much) of the effect of exposure to premodern warfare on current levels of income, while state capacity alone reduces the effect of exposure to premodern warfare on current levels of GDP per capita to a level were it is no longer

[49]The data on terrain ruggedness and the percentage of territory covered by desert and tropical rainforest comes from Nunn and Puga (2012). All other data comes from the website of John Luke Gallup. See: `https://www.pdx.edu/econ/jlgallup/country-geodata` [Date last assessed: November 7, 2017].

[50]This is not to suggest that technologies invented for warfare have never spilled over into the civil economy so to structurally raise general labor productivity. Technologies such as GPS, telegraphy, radar, airplanes, and the internet, which all have historically been developed for military purposes surely have had, and still have, strong effects on economic development. However, as also can be seen from these prominent examples, the type of military technologies that have had systematic influence on modern economic growth stem from much later episodes of warfare when industrial production was already systematically applied to the production of war material. This is not the case for military technologies produced before 1789, and I am not aware of any military technology developed in the period from 1700 to 1789 which is still systematically applied in economic production today or was used in production for extensive periods of time since 1789. Furthermore it is well understood in economic theory that sustained economic growth requires *constant* technological upgrading (Solow 1956, 1957), which furthermore suggests that pre-1789 exposure to warfare is very likely to have only affected current economic performance to some form of durable institutional change.

Table 7: Controls for geography.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log GDP per capita, PPP (second stage)						
Effective enforcement	0.585***	0.591***	0.575***	0.535***	0.545***	0.428**
	(0.101)	(0.141)	(0.096)	(0.108)	(0.095)	(0.129)
Area (sq. km)	0.000					
	(0.000)					
Terrain ruggedness	-0.033					
	(0.098)					
Desert		0.007				
(% of territory)		(0.015)				
Tropical rainforest		0.002				
(% of territory)		(0.003)				
Mean distance to coast			0.000			
			(0.000)			
Mean distance to river			-0.000			
			(0.000)			
Very suitable soil				0.001		
(% of territory)				(0.007)		
Moderately suitable soil				-0.006		
(% of territory)				(0.015)		
Very suitable for irrigation					0.003	
(% of territory)					(0.023)	
Moderately suitable for irrigation					-0.008	
(% of territory)					(0.012)	
South-America						-0.018
						(0.243)
Asia						-0.146
						(0.239)
Africa						-0.833**
						(0.306)
Europe						0.086
						(0.196)
Panel B: Effective enforcement (first stage)						
War causalities per sq. km	0.996***	0.717**	1.033***	0.810**	1.042**	0.549
(1700-1788)	(0.268)	(0.252)	(0.276)	(0.263)	(0.339)	(0.294)
Controls first stage	YES	YES	YES	YES	YES	YES
F-statistic	13.83***	8.12**	13.97***	9.52**	9.44**	3.49
Observations	65	66	65	65	65	66
Adjusted R-squared	0.136	0.190	0.168	0.301	0.166	0.153

Note: All regressions are 2SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). Data on terrain ruggedness and percentage of territory covered by desert and tropical rainforest comes from Nunn and Puga (2012). Data for all other control variables comes from the website of John Luke Gallup: `https://www.pdx.edu/econ/jlgallup/country-geodata` [Date last assessed: November 7, 2017].

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

statistically significant; and (3) the historical literature which finds that greater exposure to warfare was historically followed by the centralization of power, in the form of institutions that enhanced state capacity, rather than the diversion of power, in the form of institutions meant to constrain despotic state power (Tilly 1990; Fukuyama 2014).

From table 8 it can also be derived that at least some part of the effect of state capacity on economic development is *not* affected by constraints on the executive and (electoral) democracy since if these factors would in reality come prior to state capacity in the same causal chain, one would expect these factors to reduce some of the effect of exposure to premodern warfare on economic development in the absence of controlling for effective enforcement. This further implies that instrumenting state capacity by war causalities per sq. km from 1700 to 1789 isolates the effect of state capacity on economic development from possible confounding or mediating effects of (electoral) democracy and constraints on the executive.

Table 8: Mediation analysis exposure to premodern warfare and different type of institutions.

	(1)	(2)	(3)	(4)
War causalities per sq. km	0.591***	0.103	0.378**	0.393***
(1700-1788)	(0.133)	(0.075)	(0.114)	(0.099)
Effective enforcement		0.444***		
		(0.050)		
Constraints on executive			0.719***	
			(0.205)	
Electoral democracy				0.710**
				(0.248)
Constant	9.434***	7.149***	9.158***	9.071***
	(0.119)	(0.321)	(0.172)	(0.224)
Observations	92	66	88	88
Adjusted R-squared	0.083	0.604	0.196	0.180

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis), in the year 2014 (from the World Development Indicators database). Effective enforcement as measured by the World Justice Project. Constraints on the executive and electoral democracy as measured by Polity IV. War causalities data comes from Dincecco and Prado (2012). See appendix A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

Main results

Assuming that causalities of inter-state warfare per sq. km from 1700 to 1789 meets the exclusion restriction I am able to obtain an estimate of the causal effect of state capacity on economic development by estimating two-stage least squares (2SLS) regression models of the following form:

$$X_i = \beta_0 + \beta_1 W_i + \beta_2 \delta_i + \epsilon_i \tag{3}$$

$$Y_i = \beta_0 + \beta_1 \hat{X}_i + \beta_2 \delta_i + \epsilon_i \tag{4}$$

Where in the first stage, equation (3), I regress state capacity (X) on exposure to premodern warfare (W), and in the second stage, equation (4), I regress economic development on only the predicted values of state capacity from equation (3). To the models I add the same set of controls (δ) as with regard to the OLS estimates in table 2.

Table 9 reports the results. The first stage panel shows the substantial positive association between exposure to warfare from the beginning of the 18$^{\text{th}}$ century up until the French Revolution, and effective enforcement today.[51] Regardless of the standard controls of table 2, countries with more war causalities per sq. km between 1700 and 1789 enforce rules significantly more effective today. The second stage panels in table 9 find the effect of state capacity on current income levels to be large and highly statistically significant. The baseline model estimates, using only the predicted values in effective enforcement from the first stage, that a one unit increase in effective enforcement (measured on an 11-point scale, higher values indicating more effective enforcement) will lead, on average, to a 0.554 log-point increase in GDP per capita PPP.[52] This effect is very similar to the OLS estimate of 0.576 in

[51] Note, however, that the first stage in some of the regressions is weak to moderate (see F-statistics of models (2), (5), and (6) in table 9). This is an important limitation of using war causalities per sq. km (1700-1789) as an instrument for current levels of state capacity because it is well established that the sensitivity of 2SLS estimators to violations of the exclusion restriction depends on the strength of instrumentation.

[52] To account for spatial autocorrelation, due to countries that are located more closely to each other being more likely to fight, I cluster the standard errors by nine world regions and estimate a spatial error model,

table 2. This suggests therefore that the OLS estimates reported above, conditional on the instrument satisfying the exclusion restriction, do not overstate the effect of state capacity on economic development.

I do, however, not claim that the exclusion restriction were the estimates in table 9 rely upon is certain to hold *exactly*. Rather, the identifying assumption that exposure to premodern warfare is only related to economic development through state capacity is hopefully largely valid but perhaps not entirely (for reasons outlined in the previous section). I therefore use Conley, Hansen and Rossi (2012) to assess the sensitivity of my results to partial violations of the exclusion restriction. Formally one can think of the exclusion restriction as being equivalent to the dogmatic prior belief that γ is precisely 0 in the follow equation:[53]

$$Y_i = X_i\beta + W_i\gamma + \epsilon_i \tag{5}$$

I now loosen the exclusion restriction by assuming that γ is near to 0 but not exactly 0. More specifically I systematically vary γ in equation (5) and graph the upper and lower bound, using a 95% confidence interval, around point estimate X. Figure 2 reports the results.

The results suggest that even if more than 50% of the bivariate effect of war causalities per sq. km (1700-1788) on GDP per capita PPP in table 8 (i.e. 0.591) is due to factors other than increases in state capacity that, with 95% certainty, the true effect of state capacity on economic development remains statistically significant and positive. Increasing γ further naturally increases the area of the confidence interval that is close to or below zero. Nonetheless at all levels of γ most of the confidence interval is located above, rather than below, zero (results available on request).[54]

and find substantively similar results (results available on request).

[53]Intuitively one can understand γ in equation (5) as the true impact of W (i.e. interpretable as a simple regression coefficient) in the hypothetical case that one could fully control for the endogenous variable X.

[54]If one, for example, assumes that 80% of exposure to premodern warfare is related to economic development through factors other than state capacity (i.e. the equivalent of $\gamma = 0.473$) the model estimates that still more than 77% of the 95% confidence interval is located above zero.

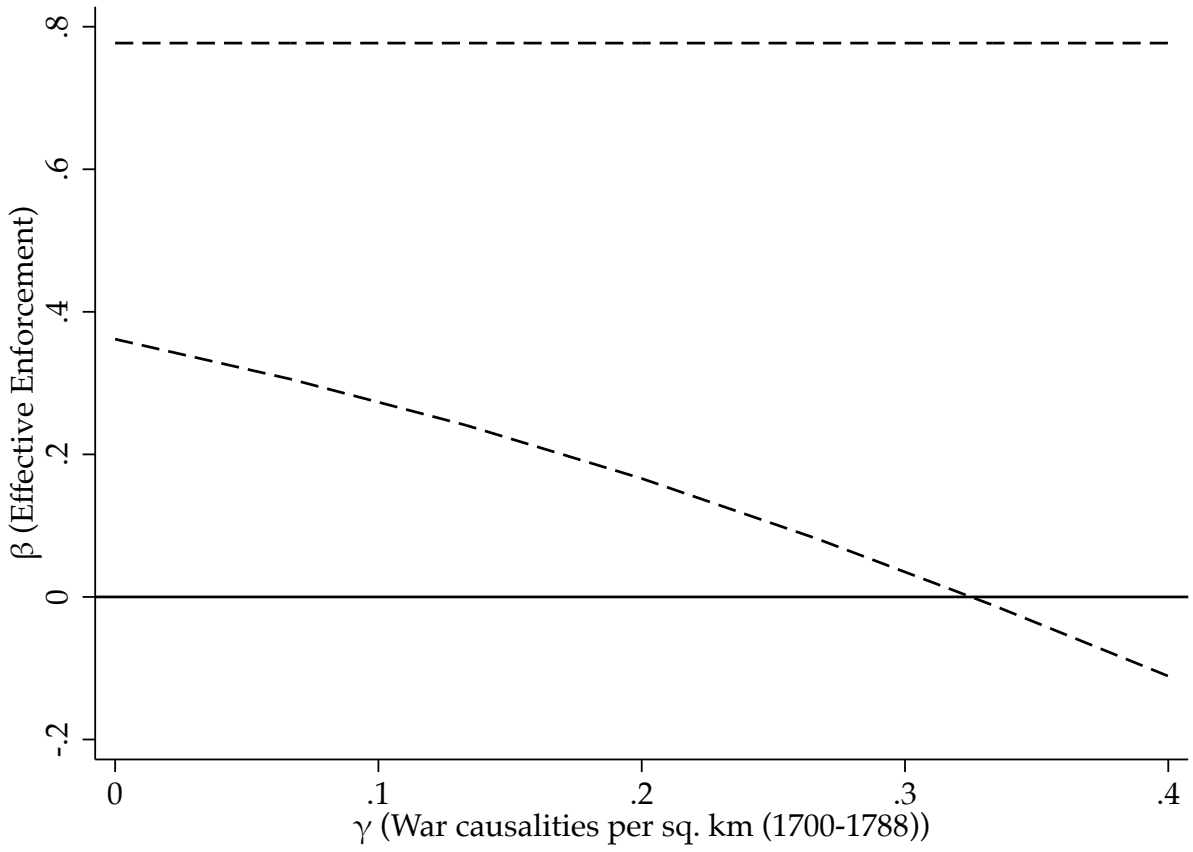
Table 9: Economic development regressed on state capacity (instrumented).

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Log GDP per capita, PPP (second stage)						
Effective enforcement	0.554***	0.573***	0.430***	0.283***	0.458**	0.606**
	(0.091)	(0.136)	(0.103)	(0.064)	(0.162)	(0.193)
Constraints on executive		-0.143				
		(0.204)				
Electoral democracy		-0.023				
		(0.257)				
Latitude			0.004			
			(0.007)			
Landlocked			-0.487			
			(0.281)			
French legal origin				0.218		
				(0.130)		
British ex-colony				-0.062		
				(0.265)		
French ex-colony				-0.722		
				(0.411)		
Other ex-colony				-0.467*		
				(0.181)		
Ethnic fractionalization					-0.006	
					(0.007)	
Social capital						-0.010
						(0.012)
Panel B: Effective enforcement (first stage)						
War causalities per sq. km	0.941***	0.635*	0.600**	0.915***	0.478*	0.353*
(1700–1788)	(0.249)	(0.259)	(0.195)	(0.229)	(0.225)	(0.171)
Controls first stage	NO	YES	YES	YES	YES	YES
F-statistic	14.23***	6.00*	9.50**	15.92***	4.50*	4.26*
Observations	66	64	55	55	66	56
Adjusted R-squared	0.139	0.267	0.436	0.353	0.323	0.428

Note: All regressions are 2SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

Figure 2: IV estimate at different degrees of exclusion restriction violation.



Note: Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description. γ refers to the effect of war causalities per sq. km (1700-1788) in the structural equation. If $\gamma = 0$ this means that the instrument can be excluded from the structural equation and hence the exclusion restriction holds precisely. The larger one assumes γ is the more the exclusion restriction is violated.

Instrumentation also allows to study the causal pathways through which state capacity affects economic development in a more unified fashion. I do so by estimating the following system of equations using three-stage least squares (3SLS):

$$X_i = \beta_0 + \beta_1 W_i + \epsilon_i \tag{6}$$

$$\gamma_i = \{L, E, I, T\}_i \tag{7}$$

For every j^{th} element in γ_i (from j = 1,...,4) I run (separate) regressions of the following form:

$$\gamma_{i,j} = \beta_0^j + \beta_1^j \hat{X}_i + \epsilon_{i,j} \tag{8}$$

$$Y_i = \beta_0^j + \beta_1^j \hat{\gamma}_{i,j} + \epsilon_{i,j} \tag{9}$$

The first stage (equation (5)) predicts a country's current level of state capacity by the degree of exposure to premodern warfare from 1700 to 1789. The variation in state capacity that is due to exposure to premodern warfare is then used in the second stage (equation (7)) to predict, in separate regressions, a country's success in crime control (L), quality of education (E), quality of infrastructure (I), and level of labor productivity (T). Finally, the variation in each causal mechanism that is determined by the part of state capacity that is associated with exposure to premodern warfare is used, in the third stage (equation (8)), to predict, in separate regressions, current levels of GDP per capita PPP (Y).[55]

Table 10 reports the results. The 3SLS estimates support the OLS mediation results reported in table 3 and 4. State capacity (instrumented by war causalities per sq. km from 1700 to 1789) is strongly related to crime control, the quality of education and -infrastructure, and labor productivity per hour worked, and each of these causal mechanisms (individually)

[55] Appendix F table 16 reports the reduced-form estimates of these 3SLS results (i.e. each causal mechanism regressed on exposure to premodern warfare using OLS).

has a large effect on GDP per capita PPP.

To sum up, the results from instrumenting state capacity by exposure to premodern warfare indicate: (1) that the OLS estimates are unlikely to overstate the effect of state capacity on economic development; (2) that law and order, education- and infrastructure quality, and technological advancement are indeed likely to be important causal mechanism through which state capacity causes economic development; and (3) that the causal effect of state capacity on economic development is unlikely to be determined by checks and balances institutions and (electoral) democracy.[56]

[56]Note also that modelling constraints on the executive or (electoral) democracy in interaction with effective enforcement does not produce a significant result (results available on request).

Table 10: Mediation analysis (instrumented).

	(1)	(2)	(3)	(4)
Panel A: Log GDP per capita PPP (third stage)				
Crime control	1.398***			
	(0.383)			
Quality education		1.203***		
		(0.272)		
Quality infrastructure			0.702***	
			(0.164)	
Labor productivity				0.024***
				(0.005)
Panel B: Mediator (second stage)				
Effective enforcement	0.396***	0.460***	0.791***	17.078***
	(0.090)	(0.116)	(0.156)	(4.750)
Panel C: Effective enforcement (first stage)				
War causalities per sq. km	0.941***	0.941***	0.934***	0.645*
(1700-1788)	(0.274)	(0.274)	(0.278)	(0.291)
F-statistic	14.50***	14.82***	14.58***	7.39**
Observations	66	66	64	43
Adjusted R-squared	0.141	0.143	0.142	0.087

Note: All regressions are 3SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. The dependent variable in the second stage is always the regressor displayed in the third stage. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

State Capacity's Effect on Growth Rates

Instrumenting state capacity by exposure to premodern warfare also enables me to study state capacity's effect on growth *rates* rather than income levels. This entails a more direct test of the main hypothesis given that fundamentally the expectation is that the level of state capacity at one point in time will affect the growth rate of an economy in the preceding period, as opposed to the contemporaneous level of income that has been generated over many decades, if not centuries.

I study the effect of state capacity on growth rates by regressing the average growth rate of a country from 1950 to 2010 (1950 is the first year when sufficient GDP data is available) on the income level and instrumented value of state capacity in 1950. This is possible, even though sufficient time series data on state capacity is lacking, given that my instrumental variable approach exploits that part of current levels of state capacity that has been determined by exposure to warfare from 1700 to 1789, and has persisted over time. Instrumenting state capacity by exposure to premodern warfare thus isolates the part of current levels of state capacity that was already established *due* to higher/lower exposure to warfare before the French Revolution, in the year 1950.[57] More specifically, I estimate the following model using 2SLS:

$$X_i = \beta_0 + \beta_1 W_i + \beta_2 \delta_i + \epsilon_i \tag{10}$$

$$G_i = \beta_0 + \beta_1 \hat{X}_i + \beta_2 \delta_i + \epsilon_i \tag{11}$$

Whereby (9) is the same first stage regression as equation (3), and G is the average economic growth rate of country i from 1950 to 2010. The average economic growth rate over this period is estimated using real GDP per capita data from the Penn World Tables. δ

[57] I would like to thank Dennis Quinn for this suggestion.

is a vector of control variables, in country i. Besides controlling for the natural log of real GDP per capita in 1950, I control for the 1950 level of human capital (proxied by the human capital index of the Penn World Tables), the 1950 level of capital stock per capita at PPP basis (Penn World Tables), and two dummies that take the value 1 if a country in 1950 had a fully constrained executive (i.e. category 7 of the original Polity IV variable) or was an (electoral) democracy, and 0 otherwise.

Table 11 reports the results. Among the 30 countries for which data on premodern causalities of war, state capacity, and 1950 to 2010 real GDP per capita is available I find that countries with more capacity to effectively implement and enforce public policy have tended to grow significantly faster over the 60 years since 1950 (see column (1)).[58] The models estimate that a one unit increase in state capacity leads, on average, to an approximately 0.5% higher annual GDP per capita growth rate, holding the initial level of income constant. Columns (2) and (3) show that the effect of state capacity goes significantly beyond simply more initial human and physical capital stock, suggesting that more state capacity enables societies to more efficiently use a given stock of capital and/or that it enables societies to accumulate more capital stock over time. Importantly, columns (4) and (5) show that more constraints on the executive and having competitive multi-party elections has no, and if anything a negative, effect on long-run growth rates.

[58]Countries included in the analysis are: Argentina, Australia, Belgium, Bolivia, Brazil, Canada, Colombia, Denmark, Ecuador, Egypt, Finland, Guatemala, India, Italy, Mexico, Netherlands, Peru, Portugal, South Africa, Spain, Sri Lanka, Sweden, Thailand, Turkey, United Kingdom, United States, Uruguay, and Venezuela.

Table 11: Economic growth regressed on state capacity (instrumented).

	(1)	(2)	(3)	(4)	(5)
Panel A: Real GDP per capita growth, 1950-2010 (second stage)					
Effective enforcement	0.489***	0.487***	0.498***	0.505**	0.548***
	(0.121)	(0.127)	(0.120)	(0.140)	(0.127)
Human capital, 1950		0.252			
		(0.414)			
Capital per capita, 1950			0.021		
			(0.021)		
Constraints executive, 1950				-0.014	
				(0.278)	
Electoral democracy, 1950					-0.299
					(0.254)
Log GDP per capita, 1950	-1.083***	-1.192***	-1.274***	-1.095***	-1.103***
	(0.216)	(0.216)	(0.310)	(0.226)	(0.221)
Panel B: Effective enforcement (first stage)					
War causalities per sq. km	0.677*	0.668*	0.693*	0.577*	0.625*
(1700–1788)	(0.278)	(0.259)	(0.282)	(0.246)	(0.262)
Controls first stage	YES	YES	YES	YES	YES
F-statistic	5.93*	6.65*	6.06*	5.51*	5.70*
Observations	30	30	30	29	29
Adjusted R-squared	0.482	0.678	0.490	0.612	0.594

Note: All regressions are 2SLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. F-statistic comes from a Sanderson-Windmeijer multivariate F-test for the excluded instrument. Adjusted R-squared refers to the first-stage. The dependent variable of each stage is displayed in the row heading. Effective enforcement as measured by the World Justice Project. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

Conclusion and Discussion

The results of this study relate to two long-term public and academic debates about the role of the state in economic development. First, and most prominently, the question of the appropriate *strength* of the state vis-a-vis civil society. Economists interested in explaining why some countries are rich while others are poor have since North (1990), Acemoglu, Johnson and Robinson (2001), and Acemoglu et al. (Forthcoming) increasingly come to focus on the *type* of state institutions that constrain political executives to decide upon policy without institutionalized accountability mechanisms such as formal checks and balances and competitive multi-party elections. The results of this study suggest, in contrast, that although institutional checks and balances and (electoral) democracy are certainly very important for many other human ends, it are the type of state institutions that enable governments to effectively implement and enforce public policy (regardless of whether this policy has been decided upon in a political system characterized by significant constraints on executive power, or not) that are substantially more important for economic performance.[59]

Second, the results of this study relate to the question of the appropriate *scope* of state intervention in the economy. Existing research has identified the supporting of markets through the securement of private property rights as the main, possibly even the only, essential government role in the process of economic development. Other activities (such a correcting market failures) are implicitly or explicitly seen as much less central, or even optional, for stimulating economic development.[60] In sharp contrast, the results from this study suggest

[59]Nonetheless it is important to notice, as Soifer (2008) has pointed out before, that the concept of state capacity does not specify for what the capacity to effectively implement and enforce policy is used for. At least theoretically, effective states could be used for implementing both genocide and public education policy depending on the prior political process. Even though the (unconditional) average effect of state capacity on economic development, at least among the 95 countries studied here, is overwhelmingly positive, future research should establish under which circumstances the effect of state capacity on economic development might diverge from this pattern.

[60]Tabellini (2005: 283) argues for example that: "[...] the key challenge for most developing countries is to create the basic legal and institutional infrastructures that protect property rights, enforce private

that states should do much more than merely supporting markets, and that a state's capacity to effectively provide public goods and overcome market failures is fundamental to economic development.

These conclusions are drawn from cross-country growth regressions that show that state capacity explains a large fraction of cross-country differences in current GDP per capita levels and post-World War II growth rates, and that the effect of state capacity is highly robust to over 100 control variables, different model specifications, and instrumentation by exposure to pre-1789 warfare. Nonetheless, causal identification in cross-country settings is extraordinary challenging; as is perhaps best illustrated by the fact that no instrument in the existing political economy of development literature has proven without controversy (for two excellent overviews see Deaton (2010) and Bazzi and Clemens (2013)). Although within-country evidence has the important, and often unrecognized, disadvantage that by far most differences in economic development exist between countries, rather than within countries, such research would very fruitfully complement this study provided that it offers greater leverage over endogeneity concerns. A rapidly evolving literature within the field of Comparative Politics already finds large variation in state capacity across regions, and executive agencies, within countries. These differences are important to study in themselves but are also likely to contain opportunities for further causal identification. Given the very large and robust cross-country effects found in this study this is certainly a very important area for further study.

contracts and allow individuals to freely take advantage of market opportunities. In principle there are many more things that governments could and should do: provide public goods, correct market failures, reduce inequalities in income and opportunities, stabilize excessive economic fluctuations. But these other government activities are not what make the difference between success and failure in economic development. The real difference is made by the basic institutional and legal infrastructures that protect property rights, enforce the rule of law and prevent abuse by governments."

References

Acemoglu, Daron, Simon Johnson and James A. Robinson. 2001. "The colonial origins of comparative development: An empirical investigation." *American Economic Review* 91(5):1369–1401.

Acemoglu, Daron, Simon Johnson and James A. Robinson. 2005. Institutions as a fundamental cause of long-run growth. In *Handbook of Economic Growth*, ed. Philippe Aghion and Stephen Durlauf. Amsterdam: Elsevier pp. 385–472.

Acemoglu, Daron, Suresh Naidu, Pascual Restrepo and James A. Robinson. Forthcoming. "Democracy does cause growth." *Journal of Political Economy* .

Aghion, Philippe, Leah Boustan, Caroline Hoxby and Jerome Vandenbussche. 2009. The causal impact of education on economic growth: Evidence from US. Unpublished working paper.

Agnafors, Marcus. 2013. "Quality of government: Toward a more complex definition." *American Political Science Review* 107(3):433–445.

Alesina, Alberto, Arnaud Devleeschauwer, William R. Easterly, Sergio Kurlat and Romain Wacziarg. 2003. "Fractionalization." *Journal of Economic Growth* 8(2):155–194.

Bates, Robert. 1981. *Markets and states in tropical Africa*. Berkeley: University of California Press.

Bates, Robert H. 2001. *Prosperity and violence: The political economy of violence*. New York: WW Norton.

Bates, Robert H. 2017. *The Development Dilemma: Security, Prosperity, and a Return to History*. Princeton University Press.

Bazzi, Samuel and Michael A. Clemens. 2013. "Blunt instruments: Avoiding common pitfalls in identifying the causes of economic growth." *American Economic Journal: Macroeconomics* 5(2):152–186.

Bellows, John and Edward Miguel. 2009. "War and local collective action in Sierra Leone." *Journal of Public Economics* 93(11):1144–1157.

Besley, Timothy and Maitreesh Ghatak. 2009. Property rights and economic development. In *Handbook of Development Economics*, ed. Dani Rodrik and Mark Rosenzweig. Vol. 5 Amsterdam: Elsevier pp. 4526–4592.

Bockstette, Valerie, Areendam Chanda and Louis Putterman. 2002. "States and markets: The advantage of an early start." *Journal of Economic Growth* 7(4):347–369.

Bolt, Jutta and Jan Luiten Zanden. 2014. "The Maddison Project: Collaborative research on historical national accounts." *The Economic History Review* 67(3):627–651.

Bradford, James C. 2006. *International encyclopedia of military history*. New York: Routledge.

Carpenter, Daniel P. 2001. *The forging of bureaucratic autonomy: Reputations, networks, and policy innovation in executive agencies, 1862-1928*. New Jersey: Princeton University Press.

Chang, Ha-Joon. 2002. *Kicking away the ladder: Development strategy in historical perspective*. London: Anthem Press.

Charron, Nicholas and Victor Lapuente. 2010. "Does democracy produce quality of government?" *European Journal of Political Research* 49(4):443–470.

Clodfelter, Micheal. 2002. *Warfare and armed conflicts: A statistical reference, 1500-2000*. Jefferson: McFarland.

Coase, Ronald H. 1937. "The nature of the firm." *Economica* 4(16):386–405.

Coase, Ronald H. 1960. "The problem of social cost." *The Journal of Law and Economics* 56(4):837–877.

Conley, Timothy G., Christian B. Hansen and Peter E. Rossi. 2012. "Plausibly exogenous." *Review of Economics and Statistics* 94(1):260–272.

Dahlman, Carl J. 1979. "The problem of externality." *The Journal of Law and Economics* 22(1):141–162.

Deaton, Angus. 2010. "Instruments, randomization, and learning about development." *Journal of Economic Literature* 48(2):424–455.

Dincecco, Mark and Gabriel Katz. 2016. "State Capacity and Long-run Economic Performance." *The Economic Journal* 126(590):189–218.

Dincecco, Mark and Mauricio Prado. 2012. "Warfare, fiscal capacity, and performance." *Journal of Economic Growth* 17(3):171–203.

Donaldson, Dave. forthcoming. "Railroads of the Raj: Estimating the Impact of Transportation Infrastructure." *American Economic Review* .

Donaldson, Dave and Richard Hornbeck. 2016. "Railroads and American economic growth: A market access approach." *Quarterly Journal of Economics* 131(2):799–858.

Evans, Peter B. 1995. *Embedded autonomy: States and industrial transformation*. New Jersey: Princeton University Press.

Evans, Peter and James E Rauch. 1999. "Bureaucracy and growth: A cross-national analysis of the effects of "Weberian" state structures on economic growth." *American Sociological Review* 64(5):748–765.

Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer. 2015. "The next generation of the Penn World Table." *American Economic Review* 105(10):3150–3182.

Fernald, John G. 1999. "Roads to prosperity? Assessing the link between public capital and productivity." *American Economic Review* 89(3):619–638.

Frankel, Marvin. 1962. "The production function in allocation and growth: A synthesis." *American Economic Review* pp. 996–1022.

Fukuyama, Francis. 2004. *State-Building: Governance and World Order in the 21st Century*. Ithaca: Cornell University Press.

Fukuyama, Francis. 2013. "What is governance?" *Governance* 26(3):347–368.

Fukuyama, Francis. 2014. *Political order and political decay: From the industrial revolution to the globalization of democracy*. London: Profile Books Ltd.

Geddes, Barbara. 1994. *Politician's dilemma: Building state capacity in Latin America*. Berkeley: University of California Press.

Gingerich, Daniel W. 2013. "Governance indicators and the level of analysis problem: Empirical findings from South America." *British Journal of Political Science* 43(3):505–540.

Grossman, Herschel I. and Minseong Kim. 1995. "Swords or plowshares? A theory of the security of claims to property." *Journal of Political Economy* 103(6):1275–1288.

Guriev, Sergei, Anton Kolotilin and Konstantin Sonin. 2011. "Determinants of nationalization in the oil sector: A theory and evidence from panel data." *Journal of Law, Economics, and Organization* 27(2):301–323.

Hadenius, Axel and Jan Teorell. 2007. "Pathways from authoritarianism." *Journal of Democracy* 18(1):143–157.

Hajzler, Christopher. 2012. "Expropriation of foreign direct investments: Sectoral patterns from 1993 to 2006." *Review of World Economics* 148(1):119–149.

Halleröd, Björn, Bo Rothstein, Adel Daoud and Shailen Nandy. 2013. "Bad governance and poor children: a comparative analysis of government efficiency and severe child deprivation in 68 low-and middle-income countries." *World Development* 48:19–31.

Hanson, Jonathan K. and Rachel Sigman. 2013. "Leviathan's latent dimensions: Measuring state capacity for comparative political research." *APSA 2011 Annual Meeting Paper* .

Harbers, Imke. 2015. "Taxation and the unequal reach of the state: Mapping state capacity in Ecuador." *Governance* 28(3):373–391.

Helliwell, John F and Haifang Huang. 2008. "How's your government? International evidence linking good government and well-being." *British Journal of Political Science* 38(4):595–619.

Hendrix, Cullen S. 2010. "Measuring state capacity: Theoretical and empirical implications for the study of civil conflict." *Journal of Peace Research* 47(3):273–285.

Herbst, Jeffrey. 2000. *States and power in Africa: Comparative lessons in authority and control*. New Jersey: Princeton University Press.

Hoffman, Philip T. 2012. "Why was it Europeans who conquered the world?" *Journal of Economic History* 72(3):601–633.

Hui, Victoria T. 2005. *War and state formation in ancient China and early modern Europe*. New York: Cambridge University Press.

Huntington, Samuel P. 1968. *Political order in changing societies*. New Haven: Yale University Press.

Jalilian, Hossein, Colin Kirkpatrick and David Parker. 2007. "The impact of regulation on economic growth in developing countries: A cross-country analysis." *World development* 35(1):87–103.

Jedwab, Remi and Dietrich Vollrath. 2015. "Urbanization without growth in historical perspective." *Explorations in Economic History* 58:1–21.

Jones, Charles I. 1995. "R & D-based models of economic growth." *Journal of Political Economy* 103(4):759–784.

Jones, Charles I. and John C. Williams. 1998. "Measuring the social return to R & D." *Quarterly Journal of Economics* 113(4):1119–1135.

Keefer, Philip and Stephen Knack. 1997. "Why don't poor countries catch up? A cross-national test of an institutional explanation." *Economic Inquiry* 35(3):590–602.

Kobrin, Stephen J. 1984. "Expropriation as an attempt to control foreign firms in LDCs: Trends from 1960 to 1979." *International Studies Quarterly* 28(3):329–348.

Kurtz, Marcus J and Andrew Schrank. 2007. "Growth and governance: Models, measures, and mechanisms." *Journal of Politics* 69(2):538–554.

La Porta, Rafael, Florencio Lopez-de Silanes, Andrei Shleifer and Robert Vishny. 1999. "The quality of government." *Journal of Law, Economics, and Organization* 15(1):222–279.

Levi, Margaret. 1989. *Of rule and revenue*. Berkeley: University of California Press.

Li, Quan. 2009. "Democracy, autocracy, and expropriation of foreign direct investment." *Comparative Political Studies* 42(8):1098–1127.

Lieberman, Evan S. 2002. "Taxation data as indicators of state-society relations: Possibilities and pitfalls in cross-national research." *Studies in Comparative International Development* 36(4):89–115.

Lucas, Robert E. 1988. "On the mechanics of economic development." *Journal of Monetary Economics* 22(1):3–42.

Mankiw, Gregory N. and Mark P. Taylor. 2011. *Economics (2nd edition)*. R.R. Donnelley, China.

Mann, Michael. 1984. "The autonomous power of the state: Its origins, mechanisms and results." *European Journal of Sociology* 25(2):185–213.

McEvedy, Colin and Richard Jones. 1978. *Atlas of world population history*. Harmondsworth, Middlesex: Penguin Books Ltd.

Messenger, Charles. 2001. *Reader's guide to military history*. Chicago: Fitzroy Dearborn Publishers.

Migdal, Joel S. 1988. *Strong societies and weak states: State-society relations and state capabilities in the Third World*. New Jersey: Princeton University Press.

Milanovic, Branko. 2013. "Global income inequality in numbers: In history and now." *Global Policy* 4(2):198–208.

Moselle, Boaz and Benjamin Polak. 2001. "A model of a predatory state." *Journal of Law, Economics, and Organization* 17(1):1–33.

Nordlinger, Eric A. 1982. *On the autonomy of the democratic state*. Cambridge, Massachusetts: Harvard University Press.

North, Douglass C. 1990. *Institutions, institutional change and economic performance*. Cambridge: Cambridge University Press.

North, Douglass C. and Barry R. Weingast. 1989. "Constitutions and commitment: The evolution of institutions governing public choice in seventeenth-century England." *Journal of Economic History* 49(4):803–832.

North, Douglass C., John J. Wallis and Barry R. Weingast. 2009. *Violence and social orders: A conceptual framework for interpreting recorded human history*. Cambridge University Press.

Nunn, Nathan and Diego Puga. 2012. "Ruggedness: The blessing of bad geography in Africa." *Review of Economics and Statistics* 94(1):20–36.

Olson, Mancur. 1993. "Dictatorship, democracy, and development." *American Political Science Review* 87(3):567–576.

Ottervik, Mattias. 2013. "Conceptualizing and measuring state capacity: Testing the validity of tax compliance as a measure of state capacity." *Quality of Government Institute Working Paper* pp. 1–16.

Pinker, Steven. 2011. *The better angels of our nature: The decline of violence in history and its causes*. London: Penguin.

Rodrik, Dani. 2000. "Institutions for high-quality growth: What they are and how to acquire them." *Studies in Comparative International Development* 35(3):3–31.

Rodrik, Dani. 2011. *The globalization paradox: Why global markets, states, and democracy can't coexist*. Oxford: Oxford University Press.

Röller, Lars-Hendrik and Leonard Waverman. 2001. "Telecommunications infrastructure and economic development: A simultaneous approach." *American Economic Review* 91(4):909–923.

Romer, Paul M. 1986. "Increasing returns and long-run growth." *Journal of Political Economy* 94(5):1002–1037.

Romer, Paul M. 1990. "Endogenous technological change." *Journal of Political Economy* 98(5):71–102.

Rothstein, Bo. 2011. *The quality of government: Corruption, social trust, and inequality in international perspective*. Chicago: University of Chicago Press.

Rothstein, Bo and Jan Teorell. 2008. "What is quality of government? A theory of impartial government institutions." *Governance* 21(2):165–190.

Skocpol, Theda. 1979. *States and social revolutions*. New York: Cambridge University Press.

Skowronek, Stephen. 1982. *Building a new American state: The expansion of national administrative capacities, 1877-1920*. Cambridge: Cambridge University Press.

Soifer, Hillel. 2008. "State infrastructural power: Approaches to conceptualization and measurement." *Studies in Comparative International Development* 43(3-4):231–251.

Soifer, Hillel. 2012. "Measuring State Capacity in Contemporary Latin America." *Revista de Ciencia Política* 32(3):585–98.

Soifer, Hillel and Matthias Vom Hau. 2008. "Unpacking the strength of the state: The utility of state infrastructural power." *Studies in Comparative International Development* 43(3):219–230.

Solow, Robert M. 1956. "A contribution to the theory of economic growth." *The Quarterly Journal of Economics* 70(1):65–94.

Solow, Robert M. 1957. "Technical change and the aggregate production function." *The Review of Economics and Statistics* 39(3):312–320.

Stiglitz, Joseph E. 1999. Knowledge as a global public good. In *Global Public Goods*, ed. Inga Kaul, Isabelle Grunberg and Marc A Stern. New York: Oxford University Press pp. 308–326.

Summers, Lawrence. 1992. "The most influential investment." *Scientific American* 267:132.

Tabellini, Guido. 2005. "The Role of the State in Economic Development." *Kyklos* 58(2):283–303.

Teorell, Jan, S. Dahlberg, S. Holmberg, B. Rothstein, A. Khomenko and R. Svensson. 2017. "The Quality of Government Standard Dataset." `http://www.qog.pol.gu.sedoi:10.18157/QoGStdJan17`.

Thomas, Melissa A. 2010. "What do the worldwide governance indicators measure?" *The European Journal of Development Research* 22(1):31–54.

Tilly, Charles. 1990. *Coercion, capital, and European states, AD 990-1992*. Cambridge, Massachusetts: Basil Blackwell.

Tilly, Charles, ed. 1975. *The formation of national states in Western Europe*. New Jersey: Princeton University Press.

van Noort, Sam. 2017. "Causes and Effects of Private Property Rights Security." Cambridge Working Papers in Economics, No. 1746.

Waldner, David. 1999. *State building and late development*. New York: Cornell University Press.

Wang, Xiaohu S. and Angang Hu. 2015. *The Chinese economy in crisis: State capacity and tax reform*. New York: Routledge.

Weingast, Barry R. 1995. "The economic role of political institutions: Market-preserving federalism and economic development." *Journal of Law, Economics, & Organization* 11(1):1–31.

A Data description main variables

Log GDP per capita, PPP: The natural log of GDP per capita at purchase power parity in constant 2011 international dollars. Data comes from the World Development Indicators, and refers to the year 2014.
Effective enforcement: Survey measure of whether state regulations are effectively enforced by the state. Data comes from the World Justice Project, and refers to the year 2014. To aid the interpretation of effects the original variable which ranges from 0 to 1 is multiplied by 10. Higher scores indicate more effective enforcement. See for the variable's full codebook: `https://worldjusticeproject.org/sites/default/files/documents/rolindex2016_variables.pdf` (pages 21-23) [Date last assessed: February 25, 2018].
War causalities per sq. km, 1700-1789: The number of casualties of state armed forces in major external conflicts from 1700 to 1789. The term "casualty" refers to all persons lost in active military service, including those killed in action or by disease, disabled by physical or mental injuries, captured, deserted, or missing. This data is collected by Dincecco and Prado (2012) on the basis of Clodfelter (2002). To account for country size this variable is scaled by (current) territory area in km^2. See the main text and appendix of Dincecco and Prado (2012) for a detailed description of the data.
Cost of crime: Crime control index of the Hertie Governance Report Indicators 2014. The index includes the number of burglary, homicide, robbery, and violent crimes cases reported by the police per 10,000 inhabitants and the number of police officers per 10,000 inhabitants (from Eurostat), whether crime is effectively controlled and whether the criminal justice system works effectively and impartial (from the World Justice Project), the extent to which the state ensures security across its territory (from the Institutional Profiles Database), the self-reported expenditure on private security of citizens and business, citizens' and entrepreneurs' perception of crime, and the proportion of citizens and entrepreneurs that report losses due to theft, robbery, vandalism, or arson in the last fiscal year (from the World Bank Enterprise Surveys). I have rescaled this variable to a range with a minimum of 0. Higher scores indicate less costs incurred as a results of crime. Data refers to the year 2012. See for the variable's full codebook: `https://www.hertie-school.org/fileadmin/2_Research/1_About_our_research/4_The_Governance_Report/Indicators/2014/Downloads/GovReport2014_Indicators_IndicatorsCodebook.pdf` (pages 1-4) [Date last assessed: October 28, 2017].
Quality of education: Education provision index of the Hertie Governance Report Indicators 2014. The index includes the cumulative expenditure on educational institutions per student, ratio of teachers salary to GDP per capita, the first and second component of the PISA achievement variables, the gross and net enrolment ratio in education on all levels, the quality of teaching in rural areas, the coverage of public schools, and the quality of teaching and research at the university level. It uses data from the OECD, UNESCO Institute for Statistics, and the Institutional Profiles Database. I have rescaled this variable to a range with a minimum of 0. Higher scores indicate higher quality education. Data refers to the year 2012. See for the variable's full codebook: `https://www.hertie-school.org/fileadmin/2_Research/1_About_our_research/4_The_Governance_Report/Indicators/2014/Downloads/GovReport2014_`

Indicators_IndicatorsCodebook.pdf (pages 4-7) [Date last assessed: October 28, 2017].
Quality of overall infrastructure: Survey question from the Global Competitiveness Report of the World Economic Forum. The question asks "How would you assess general infrastructure (e.g., transport, telephony, and energy) in your country?" Higher scores indicate higher quality infrastructure. Data refers to the year 2014. See: http://reports.weforum.org/global-competitiveness-report-2014-2015/view/methodology/ [Date last assessed: October 28, 2017].
Labor productivity per hour worked (PPP): GDP per hour worked adjusted for cross-country price differences. Data comes from the output, labor, and labor productivity, 1950-2017 dataset of the Total Economy Database. Data refers to the year 2014. See: https://www.conference-board.org/data/economydatabase/index.cfm?id=27762 [Date last assessed: October 28, 2017].

B Data description other variables

Human Development Index: Composite index that measures the average life expectancy at birth, average adult literacy rate, the combined gross enrollment ratio for primary, secondary, and tertiary education, and GDP per capita in PPP-terms. To aid the interpretation of effects the original variable which ranges from 0 to 1 is multiplied by 10. Data refers to the year 2014. See: `http://hdr.undp.org/en/data` [Date last assessed: November 22, 2017].
Child mortality: Probability that a newborn baby will die before reaching the age of five (per 1,000 live births). Data comes from the World Development Indicators, and refers to the year 2014.
Constraints on the executive: Expert coded measure of the extent of institutionalized constraints on the decision-making powers of chief executives, whether individuals or collectivities. Such limitations may be imposed by any accountability group in the form of: legislators, the ruling party in one-party states, councils of nobles or powerful advisors in monarchies, the military in coup-prone polities, or a strong independent judiciary. The data comes from the Polity IV project, and refers to the year 2014. The variable is included as a dummy that takes the value 1 if a country scores the maximum (i.e. 7) score on the original ordinal variable. This category refers to the situation were accountability groups have effective authority equal to or greater than the executive in most areas of activity. See for the variable's full codebook: `http://www.systemicpeace.org/inscr/p4manualv2016.pdf` (pages 24-25) [Date last assessed: October 27, 2017].
Electoral democracy: A dummy variable that takes the value 1 if chief executives are typically selected through competitive elections involving two or more major parties or candidates, and 0 otherwise. Elections may be popular or by an elected assembly. Data comes from Polity IV (see pages 21-22 of codebook referred to above), and refers to the year 2014.
Latitude: The absolute value of the latitude of the capital city. Data comes from La Porta et al. (1999).
Landlocked: A dummy that takes the value 1 if the country in question is Afghanistan, Andorra, Armenia, Austria, Azerbaijan, Belarus, Bhutan, Bolivia, Botswana, Burkina Faso, Burundi, Central African Republic, Chad, Czech Republic, Ethiopia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Laos, Lesotho, Liechtenstein, Luxembourg, Macedonia, Malawi, Mali, Moldova, Mongolia, Nepal, Niger, Paraguay, Rwanda, San Marino, Serbia, Slovakia, South Sudan, Swaziland, Switzerland, Tajikistan, Turkmenistan, Uganda, Uzbekistan, Vatican City State, Zambia, or Zimbabwe, and 0 otherwise.
French legal origin: Dummy that takes the value 1 if the legal origin (company/commercial law) of the country in question is French, and 0 otherwise. Data comes from La Porta et al. (1999).
Colonial background: Dummy capturing the identity of colonizer (if any). Each country that has been colonized since 1700 is coded. Only western colonizers (i.e. excluding Japanese colonialism) are considered. The British settler colonies (the US, Canada, Australia, Israel, and New Zealand), Ireland, and Malta are excluded. In cases of several colonial powers, the

last one is counted, if it lasted for 10 years or longer. In the main model I include dummies for British, French, and "other" ex-colony, using countries that have never been colonized as the reference category. Data comes from Hadenius and Teorell (2007).

Ethnic fractionalization: The probability that two randomly selected people from the country in question will not belong to the same ethnic-linguistic group. Data comes from Alesina et al. (2003).

Social capital: Percentage of respondents in the World Value Survey that believe that "most people can be trusted". Data refers to the year 2014. If missing, data is imputed from earlier years going back until 2000.

Pre-1990 OECD member: A dummy that takes the value 1 if the country in question is Canada, United States, United Kingdom, Denmark, Iceland, Norway, Turkey, Spain, Portugal, France, Ireland, Belgium, Germany, Greece, Sweden, Switzerland, Austria, Netherlands, Luxembourg, Italy, Japan, Finland, Australia, or New Zealand, and 0 otherwise.

Police (per 1,000 inhabitants): Data comes from the United Nations Office on Drugs and Crime, and refers to the year 2014. See for data: `https://data.unodc.org/` [Date last assessed: October 28, 2017].

Education expenditure (per capita): Variable is calculated based on education expenditure as a % of GDP, total population, and GDP per capita (current US $). Variable is measured in units of $100. All data comes from the UNESCO Institute for Statistics, and refers to the year 2014. See: `http://data.uis.unesco.org/` [Date last assessed: October 28, 2017].

Infrastructure expenditure (per capita): Public investment (with private participation) in transport, energy, and telecom infrastructure. Data on investment and population size comes from the World Development Indicators. Variable is measured in units of $100. Data refers to the year 2014. If missing, data is imputed going back to the year 2000.

R&D expenditure (per capita): Variable is generated from data on research and development (R&D) expenditure as a % of GDP, GDP at market prices (current US $), and population size. Variable is measured in units of $100. All data comes from the World Development Indicators, and refers to the year 2014.

Capital stock per hour worked (PPP): Data comes from the output, labor, and labor productivity, 1950-2017 dataset of the Total Economy Database. Variable is measured in units of $10. Data refers to the year 2014. See: `https://www.conference-board.org/data/economydatabase/index.cfm?id=27762` [Date last assessed: October 28, 2017].

Stateness, 1700: The level of "stateness" in 1700. Stateness is measured by the state antiquity index of Bockstette, Chanda and Putterman (2002). The scores reflect (I) the existence of a government; (II) the proportion of the territory covered; and (III) whether it was indigenous or externally imposed. The variable ranges from 0 to 50. Higher scores indicate higher levels of political centralization. The variable refers to the years 1650 to 1700.

Log GDP per capita, 1700: The natural log of GDP per capita in 1700. The date are the Maddison estimates described in Bolt and Zanden (2014).

Urbanization, 1700: The level of urbanization in 1700, measured as the percentage of the population living in cities of greater than 20,000 people. The data comes from Jedwab and

Vollrath (2015). Given that Jedwab and Vollrath (2015) provides data for only 23 countries in 1700 and 56 countries in 1500, I have imputed data from 1500 were possible.
Population density, 1700: Size of the population in 1700 relative to current territory. Historic population data comes from McEvedy and Jones (1978).
Log real GDP per capita, 1950: Natural log of GDP per capita in the year 1950 (in constant 2005 national prices). Data comes from the Penn World Tables. See Feenstra, Inklaar and Timmer (2015) for data description.
Human capital, 1950: Human capital index of the Penn World Tables, in the year 1950. This index is based on the years- and returns to schooling. Higher scores indicate higher levels of human capital stock. See Feenstra, Inklaar and Timmer (2015) for data description.
Capital stock per capita PPP, 1950: Value of capital stock in purchase-power parity terms, in the year 1950. Data comes from the Penn World Tables. See Feenstra, Inklaar and Timmer (2015) for data description.
Constraints on the executive, 1950: Dummy that takes the value 1 if a country scores the maximum score (i.e. 7) on Polity IV's constraints on the executive variable in the year 1950, and 0 otherwise.
Electoral democracy, 1950: Dummy that takes the value 1 if a country was an electoral democracy in 1950, and 0 otherwise. Data comes from Polity IV.

C Summary statistics other variables

Table 12: Summary statistics other variables.

Variable	Mean	Std. Dev.	Min.	Max.	N
Human Development Index	7.215	1.451	4.023	9.439	95
Child mortality	25.929	28.039	2.4	126.4	95
Constraints on executive	0.457	0.501	0	1	92
Electoral democracy	0.63	0.485	0	1	92
Latitude	26.265	17.275	1	64	78
Landlocked	0.221	0.417	0	1	95
French legal origin	0.462	0.502	0	1	78
British ex-colony	0.221	0.417	0	1	95
French ex-colony	0.105	0.309	0	1	95
Other ex-colony	0.495	0.503	0	1	95
Ethnic fractionalization	44.099	25.824	0.2	93.018	94
Social capital	25.999	16.561	6.289	76.123	73
Pre-1990 OECD member	0.2	0.402	0	1	95
Europe	0.326	0.471	0	1	95
South-America	0.084	0.279	0	1	95
Asia	0.221	0.417	0	1	95
Sub-Saharan Africa	0.189	0.394	0	1	95
Police officers (per 100,000 inhabitants)	299.11	127.202	83.42	670.180	48
Education expenditure (per capita)	869.073	1253.146	11.176	5920.203	64
Infrastructure expenditure (per capita)	88.484	86.416	2.601	341.17	52
R&D expenditure (per capita)	384.963	565.122	0.509	1895.536	64
Capital stock per hour worked (PPP)	8.061	5.920	0.295	18.409	49
Stateness, 1700	30.711	13.928	0	50	91
Log GDP per capita, 1700	7.734	1.478	5.298	11.835	27
Urbanization, 1700	9.367	7.347	0	40	49
Population density, 1700	16.662	22.935	0.021	116.577	58
Real GDP per capita growth, 1950-2010	2.246	1.663	-2.007	9.76	92
Log GDP per capita, 1950	8.079	0.979	5.211	9.451	31
Human capital, 1950	1.709	0.47	1.076	2.669	31
Capital per capita, 1950	9.538	8.534	0.24	33.085	31
Constraints executive, 1950	0.306	0.466	0	1	49
Electoral democracy, 1950	0.388	0.492	0	1	49

Note: See appendix B for datasources and coding.

D OLS results with standardized coefficients

Table 13: Economic development regressed on state capacity.

	(1)	(2)	(3)	(4)	(5)	(6)
Effective enforcement	0.829***	0.729***	0.645***	0.744***	0.662***	0.689***
	(0.065)	(0.078)	(0.103)	(0.103)	(0.085)	(0.089)
Constraints on executive		0.126				
		(0.180)				
Electoral democracy		0.257				
		(0.213)				
Latitude			0.247*			
			(0.105)			
Landlocked			-0.741**			
			(0.240)			
French legal origin				0.162		
				(0.176)		
British ex-colony				-0.411		
				(0.257)		
French ex-colony				-0.895**		
				(0.326)		
Other ex-colony				0.000		
				(0.227)		
Ethnic fractionalization					-0.333***	
					(0.085)	
Social capital						0.055
						(0.079)
Constant	9.307***	9.103***	9.390***	9.423***	9.301***	9.446***
	(0.074)	(0.171)	(0.080)	(0.178)	(0.068)	(0.079)
Observations	95	92	78	78	94	73
Adjusted R-squared	0.570	0.566	0.656	0.646	0.637	0.582

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis), in the year 2014 (from the World Development Indicators database). Effective enforcement as measured by the World Justice Project. Interval/ratio variables are standardized using Z-scores. All interval/ratio variables are measured in units that are equal to the variable's standard deviation as reported in tables 1 and 12 (regardless of differences in sample size due to missing cases on other control variables). See appendixes A and B for detailed data description.
$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

E Alternative measures of economic development

Table 14: Relationship between state capacity and Human Development Index.

	(1)	(2)	(3)	(4)	(5)	(6)
Effective enforcement	0.749***	0.619***	0.540***	0.634***	0.561***	0.619***
	(0.054)	(0.065)	(0.084)	(0.084)	(0.072)	(0.076)
Constraints on executive		0.348				
		(0.250)				
Electoral democracy		0.409				
		(0.297)				
Latitude			0.027**			
			(0.008)			
Landlocked			-0.922**			
			(0.306)			
French legal origin				0.135		
				(0.264)		
British ex-colony				-0.866*		
				(0.346)		
French ex-colony				-1.404**		
				(0.479)		
Other ex-colony				-0.047		
				(0.322)		
Ethnic fractionalization					-0.022***	
					(0.004)	
Social capital						0.006
						(0.006)
Constant	3.247***	3.539***	3.686***	4.132***	5.208***	4.020***
	(0.347)	(0.359)	(0.394)	(0.630)	(0.539)	(0.408)
Observations	98	95	81	81	97	75
Adjusted R-squared	0.555	0.573	0.666	0.685	0.669	0.562

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is the Human Development Index, in the year 2014. Effective enforcement as measured by the World Justice Project. See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

Table 15: Relationship between state capacity and child mortality.

	(1)	(2)	(3)	(4)	(5)	(6)
Effective enforcement	-10.562***	-7.788***	-7.122***	-8.939***	-5.973***	-7.936***
	(1.420)	(1.551)	(1.927)	(1.975)	(1.425)	(1.878)
Constraints on executive		-9.005				
		(5.673)				
Electoral democracy		-5.239				
		(7.711)				
Latitude			-0.466*			
			(0.182)			
Landlocked			20.438**			
			(7.059)			
French legal origin				0.619		
				(7.024)		
British ex-colony				27.382**		
				(8.973)		
French ex-colony				25.957*		
				(11.127)		
Other ex-colony				-6.139		
				(7.958)		
Ethnic fractionalization					0.539***	
					(0.099)	
Social capital						-0.045
						(0.140)
Constant	81.979***	74.192***	75.865***	69.047***	34.162***	64.866***
	(9.277)	(8.996)	(10.554)	(14.297)	(9.939)	(10.309)
Observations	98	95	81	81	97	75
Adjusted R-squared	0.298	0.308	0.414	0.444	0.484	0.257

Note: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is mortality rate under-5 (per 1,000 live births), in the year 2014. Effective enforcement as measured by the World Justice Project. See appendixes A and B for detailed data description.
$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.

F Reduced-form of 3SLS mediation analysis

Table 16: Relationship between exposure to premodern warfare and causal mechanisms.

	(1) Crime control	(2) Quality education	(3) Quality infrastructure	(4) Labor productivity
	Panel A: Bivariate			
War causalities per sq. km	0.370***	0.492***	0.726***	8.863**
(1700-1788)	(0.104)	(0.102)	(0.161)	(2.965)
Observations	76	97	90	53
Adjusted R-squared	0.087	0.111	0.107	0.071
	Panel B: Regional fixed effects			
War causalities per sq. km	0.157*	0.109*	0.301*	3.163
(1700-1788)	(0.071)	(0.041)	(0.148)	(3.479)
Europe	0.550*	0.500**	0.663*	7.686
	(0.208)	(0.163)	(0.321)	(8.427)
Africa	-0.352	-0.813***	-0.711*	-18.201*
	(0.226)	(0.217)	(0.342)	(7.162)
Asia	0.519	-0.296	0.062	-11.689
	(0.272)	(0.218)	(0.379)	(9.768)
South-America	-0.324	-0.250	-0.898**	-16.414*
	(0.276)	(0.188)	(0.338)	(7.492)
Observations	75	96	90	53
Adjusted R-squared	0.350	0.463	0.301	0.246

Note: All regressions are OLS. Robust standard errors are reported in parentheses. All regressions contain a constant which is not reported. The dependent variable is displayed in the column heading. War causalities data comes from Dincecco and Prado (2012). See appendixes A and B for detailed data description.

$***$ p<0.001, $**$ p<0.01, $*$ p<0.05.