

Cambridge Working Paper Economics

Cambridge Working Paper Economics: 1746

CAUSES AND EFFECTS OF PRIVATE PROPERTY RIGHTS SECURITY

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23 October 2017

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Causes and Effects of Private Property Rights Security

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This version: **October 22, 2017**

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Abstract

Private property rights security is currently seen as central to explaining cross-country differences in economic development. Variation in private property rights security itself is perceived to be best explained by differences in the degree to which the political system is able to constrain the despotic power of state executives. I reassess the existing evidence for these two hypotheses and find that: (1) higher levels and significant changes in private property rights security and constraints on the executive are *not* correlated with higher levels of income and (changes in) growth rates; (2) the commonly used instrument for constraints on the executive and private property rights security – the natural log of European settler mortality – is invalid because it is associated with current levels of income besides its effect through private property rights security and constraints on the executive; and (3) the regularly cited Korean case is in fact evidence against these hypotheses. I provide explanations for these findings and call for a rethinking of which *type* of institutions and policies are decisive for growth.

Keywords: Institutions, Private Property Rights Security, Economic Development, Constraints on the Executive

JEL Codes: O11, P16, P51

*I would like to thank Ha-Joon Chang, Tanushree Goyal, Bo Rothstein, Aliandra Barlete, Floris van Dort, Augur Pierce, Fernán Restrepo, Bas Monsewije, Shailaja Fennell and participants at the Cambridge Centre of Development Studies PhD Seminar for helpful comments on earlier drafts of this paper.

1 Introduction

Average income levels in today’s richest and poorest countries differ by a factor of more than 30. These cross-country differences in income are much larger than the differences within countries, suggesting that any individual’s standard of living is much more strongly determined by the randomness of one’s country of birth, rather than one’s individual talent and dedication (Milanovic, 2013). What explains these cross-country differences, and what, if anything, poor countries can do to catch-up, remains one of the most important questions in economics.

Over the past 30 years the economic growth literature, following the influential work of North (1990), has reached a widespread consensus suggesting that institutions are the most important cause of cross-country differences in economic development. This literature strongly emphasizes the importance of private property rights security for economic development (see, among many others, the work of: Acemoglu, Johnson and Robinson (2001); Rodrik, Subramanian and Trebbi (2004); Clague et al. (1999); Knack and Keefer (1995)).¹

When studying the causes of private property rights security the existing literature has tended to focus on the type of political institutions that constrain what could be called “despotic state power” (see, for example, the work of: Acemoglu, Johnson and Robinson

¹Private property rights are rights given to private agents granting them the exclusive authority over the use of a resource (i.e. a good or asset). This can entail the right to use the good or asset for consumption or investment (i.e. “use rights”), the right to delegate the good or asset to another agent (i.e. “transfer right”) and the right to contract with other parties by renting, pledging or mortgaging the good or asset (i.e. “contract right”). Private property rights security could plausibly affect economic development through (at least) four mechanisms. First, ill-defined and poorly protected private property rights might lower investment because they increase the uncertainty agents face as to whether they will be able to reap the benefits of their investment in the future. Second, insecure private property rights might divert resources from productive purposes toward private protection which is likely to be inefficient due to a decrease in the division of labor and due to economies of scale in securing property. Third, poorly defined private property rights and the difficult to enforce contracts that follow from them might retard potential gains of trade in markets where exchanges require significant and irreversible commitments in the present, whether in the form of goods manufactured and shipped, or fixed investments made, in the expectation of payment or returns in the future. Last, non-registered, non-recognized and poorly protected private property rights might reduce access to financial markets because potential investors are unable to use their existing property as collateral for future loans (which might reduce investment because it hampers the possibility for agents to use both their past income (savings) and future income for investment) (Besley and Ghatak, 2009; Clague et al., 1999; De Soto, 2000).

(2001, 2005), Acemoglu and Johnson (2005), North (1990), North and Weingast (1989), Moselle and Polak (2001), Olson (1993), Grossman and Kim (1995), Besley and Ghatak (2009), and Keefer and Knack (1997)).² Formal checks-and-balances on despotic state power are seen to increase the security of private property rights by limiting the ability of state executives to use the state apparatus as a means to enrich themselves through the expropriation of citizens outside the political elite. Although in theory state executives could refrain from expropriation and promise to respect the property of non-elites in the future, in practice such commitments will not be credible in the absence of institutional guarantees constraining their actual ability to expropriate private property (Acemoglu, Johnson and Robinson, 2005). The expectation is that in the absence of significant formal constraints on executive power, incentives to invest will be severely reduced given that economic agents outside of the political elite are fundamentally uncertain if they will be able to reap the benefits of their investments in the future (Besley and Ghatak, 2009; Acemoglu, Johnson and Robinson, 2001; Rodrik, Subramanian and Trebbi, 2004; Easterly, 2001).

The evidence for the dual claim that private property rights security causes economic development, and that private property rights security is in turn caused by institutions that constrain despotic state power is derived from three sources. First, the “natural experiment” introduced by the demarcation of Korea in the period from 1945 to 1953. While both North and South Korea started off in 1945 with equivalent background characteristics, they over time developed very different institutions with regard to the regulation of executive power and the protection of private property rights. Acemoglu and Robinson (2012) and Acemoglu, Johnson and Robinson (2005) suggest that the difference in income levels that we observe between North and South Korea today can be explained by post-World War II South Korea introducing secure private property rights and significant institutional constraints

²I 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.

on despotic state power. Second, evidence in favor of the importance of institutions that constrain despotic state power and secure private property rights is obtained from (cross-sectional) ordinary least square (OLS) regression models which find that countries with more institutionally constraint political executives and more secure private property rights are on average richer (Acemoglu, Johnson and Robinson, 2001, 2005; Hall and Jones, 1999; Clague et al., 1999; Knack and Keefer, 1995; Keefer and Knack, 1997), and that countries with more constraint political executives tend to have more secure private property rights (Acemoglu, Johnson and Robinson, 2001; Acemoglu and Johnson, 2005; La Porta et al., 2004). Third, the existing literature derives evidence from (cross-sectional) instrumental variable (IV) regression models that use the natural log of European settler mortality in previously colonized countries as an instrument for differences in the security of private property rights (Acemoglu, Johnson and Robinson, 2001) and differences in the degree of constraints on despotic state power (Acemoglu and Johnson, 2005), and find strong effects on current income levels.

I re-examine these three pieces of evidence and conclude that the existing literature does not provide convincing evidence for the claim that private property rights security and constraints on despotic state power are important causes of economic development.

First, I find that the South Korean government, throughout South Korea's period of rapid economic development (1963-1987), heavily violated the private property rights of many companies across a large number of sectors, most of which then and now constitute(d) South Korea's most important industries. Furthermore I find that South Korea only developed significant constraints on its executive in 1988, well *after* it already achieved average GDP per capita PPP growth rates of about 7% per year in the preceding 25-year period.

Second, I find that while insecure private property rights is typically claimed to explain the *underdevelopment* of currently poor countries, more secure private property rights are *only* associated with higher levels of economic development *within* the group of countries that have already attained a high level of income (according to the 2017 World Bank income

classification). Even within the group of high income countries the effect of private property rights security is small and explains little of cross-country variance in GDP per capita PPP. With regard to the commonly used constraints on the executive variable from Polity IV (the literature's measure of choice for operationalizing despotic state power) I find that this variable explains little to none of cross-country differences in economic development and/or private property rights security. Previously found effects seem to be due to econometric misspecification generated by using the variable as if measured on an interval/ratio rather than on an ordinal measurement level (see appendix E for the full codebook of Polity IV's constraints on the executive variable).

Last, using simple OLS mediation analysis I show that the log of European settler mortality is likely to be an invalid instrument for private property rights security and institutions constraining despotic state power. This is because European settler mortality remains strongly and significantly correlated with GDP per capita PPP after controlling for private property rights security or constraints on the executive. This means that European settler mortality is either directly related to today's income levels or its effect on economic development is mediated through other mechanisms besides institutions that constrain despotic state power and provide security to private property rights. Both these possibilities would constitute a violation of the exclusion restriction of IV regression models, which renders IV estimates invalid.

In addition to the existing literature I also examine the time series evidence for the private property rights and constraints on despotic state power hypotheses. I find here that levels of constraints on the executive and private property rights security *are not* correlated with subsequent growth rates, and that exceptionally large and sustained changes in the level of constraints on the executive and private property rights security *are not* correlated with subsequent changes in growth rates.

I demonstrate that these results hold across a wide range of alternative measures of private property rights security and constraints on despotic state power. In the text I present the

results using private property rights security as measured by the Economic Freedom Index of the Heritage Foundation and constraint on the executive as measured by Polity IV (which are the commonly used measures in the literature). As a robustness check I show in appendix D that all the results with respect to private property rights security also hold for government expropriation without adequate compensation taken from the World Justice Project, private property rights security as measured by the Bertelmann Transformation Index (BTI), and contract viability and risk of expropriation as measured by the International Country Risk Guide of Political Risk Services.³ With regard to constraints on despotic state power I show in appendix F that all results reported in the text also apply to constraints on the government as measured by the World Justice Project and (liberal) democracy as measured by the interpolated polity measure of Polity IV/Freedom House.⁴

The results are also robust to excluding the East Asian countries that all, with the possible exception of Japan, have industrialized under authoritarian institutions that did not provide much security to private property rights (Taiwan and South Korea), and in some cases have still not developed such institutions (China, Singapore, and Hong Kong).⁵ All results also hold when excluding large oil-producing countries that are generally characterized by insecure private property rights and little constraints on despotic state power but have relatively high average income levels.⁶ These results are available on request.

³With regard to these measures I find that more secure private property rights (as measured by BTI) and contract viability/expropriation risk are only associated with higher levels of GDP per capita PPP among high income countries (as classified by the World Bank). Government expropriation without adequate compensation is not correlated with GDP per capita PPP at any income level.

⁴Here I find that more constraints on the government is not associated with higher income levels at any level of development. Constraints on the government is associated with more secure private property rights but only among middle and high income countries. Higher levels of democracy are only associated with higher levels of economic development among high income countries. Democracy is, however, associated with more secure private property rights at all development levels.

⁵Cases that I exclude in this robustness check are: Japan, China, Taiwan, South Korea, and Singapore. GDP data for Hong Kong is unavailable so this case is omitted in the original sample as well.

⁶I here exclude countries that in 2013 extracted more than 20% of their GDP from the production of oil (according to World Bank data): Algeria, Angola, Azerbaijan, Chad, Equatorial Guinea, Gabon, Iran, Iraq, Kazakhstan, Kuwait, Libya, Oman, Qatar, Republic of Congo, Saudi Arabia, United Arab Emirates, and Venezuela. Two other countries also extracted more than 20% of their GDP from oil in 2013 but are (already) excluded from the main sample due to a lack of data on private property rights security and constraints on the executive, these are: Brunei Darussalam and South Sudan.

The findings of this paper have substantial implications for development policy and research around the world. The results suggest that introducing more institutional constraints on despotic state power (although important for many other human ends) is unlikely to lead to more secure private property rights and better economic outcomes. Further, more secure private property rights in itself is unlikely to lead to better economic performance, particularly at lower levels of development. Overall it seems fair to conclude that while the existing literature has found innovative ways to isolate the effect of institutions from other fundamental explanations for economic development, such as geography and culture, it has not (yet) established convincingly *which* institutions and policies are most decisive for enhancing economic growth in poor countries.

The rest of this paper is organized as follows. First, I describe in more detail the existing evidence with regard to the causes and effects of private property rights security. Second, I reassess the Korean experience after World War II. Third, I reassess the existing OLS evidence regarding the relationships between constraints on despotic state power, private property rights security, and economic development. Fourth, I study the validity of the European settler mortality instrument. Fifth, I assess the relationship between constraints on despotic state power, private property rights security, and economic development over time. Last, I conclude by summarizing the main results and by drawing implications for future research.

2 The Existing Evidence on the Causes and Effects of Private Property Rights Security

Studying the causes and effects of private property rights security naturally suffers from the fundamental problem that researchers cannot randomly assign differences in private property rights security and/or differences in the degree to which the state executive is institutionally constraint across countries. The existing literature has therefore relied on three alternative

identification strategies.

First, the literature has focused on the “natural experimental” experience of Korea after World War II.⁷ Before the separation of Korea in 1945 North and South Korea were both part of the same country and shared the same history, geography, culture and economic development levels. Following the demarcation both countries introduced very different types of institutions. South Korea became a democracy with significant constraints despotic state power, and institutions that protect private investors from arbitrary confiscation by the state. North Korea, in contrast, became a notorious dictatorship with little to no constraints on executive power and virtually no private property rights at all (since most land and assets are owned by the state). Given that South Korea, with a GDP per capita PPP of approximately \$35,000, is now more than 19 times richer North Korea (which has an estimated GDP per capita of \$1800) Acemoglu and Robinson (2012) and Acemoglu, Johnson and Robinson (2005) take the Korean case as evidence for the large and causal effect of (the type of) institutions that constrain despotic state power and provide security to private property rights.

Second, a large body of relatively dated but still widely cited studies use (cross-sectional) OLS regression models to document a strong positive association between private property rights security (typically measured by citizen and/or expert surveys) and investment, growth rates and GDP per capita PPP levels (see, among others: Hall and Jones (1999), Clague et al. (1999), Knack and Keefer (1995), Keefer and Knack (1997)). Constraints on despotic state power is predominantly measured by the “constraints on the executive” variable of the Polity IV project, and is found, among others, by Acemoglu and Johnson (2005), Acemoglu, Johnson and Robinson (2001) and Keefer and Knack (1997) to be significantly related to

⁷The term “natural experimental” is somewhat misleading in this context because the treatment, differences in private property rights security and despotic state power, is in the case of Korea not assigned by researchers themselves (making the design strictly speaking “observational” rather than “experimental”), and the treatment is also not assigned randomly. In addition, the process through which the treatment was assigned in the Korean case was not “natural”, in the sense of exogenous to human agency, but was rather a result of a political process that assigned different type of institutions to both countries over time.

private property rights security, investment and GDP per capita.⁸

Last, evidence for the importance for economic development of institutions that constrain despotic state power and secure private property rights is derived from (cross-sectional) IV regression models. Given that OLS estimates are likely to be biased due to omitted variable bias and/or reversed causality, Acemoglu, Johnson and Robinson (2001) (henceforward AJR, 2001) and Acemoglu and Johnson (2005) have attempted to instrument for private property rights security and institutions constraining despotic state power using variation in 17th to 19th century European settler mortality rates in previously colonized countries.

AJR (2001) claim that: (1) European governments introduced very different types of institutions in different colonies. In some countries, Europeans set up political institutions geared to the extraction of natural resources and the exploitation of labor which naturally did not limit the despotic power of political executives and therefore rendered private property rights insecure (such as in: the Congo, India, and Namibia). In other colonies they set up institutions like those in Western Europe, which did constrain despotic state power and did provide security to private property rights (such as in: the United States, Australia, and Canada); (2) these different colonization strategies were partly influenced by the feasibility of European settlement. In regions where the disease environment was hostile to European survival, Europeans chose not to settle and subsequently introduced “bad” political and economic institutions. In places where they could survive European settlers demanded to live under institutions similar to those in Western Europe, thereby importing into these

⁸Democracy is in some studies hypothesized to affect economic development through, among many other things, private property rights security (Przeworski and Limongi, 1993). Regular and competitive elections are seen as a constrain on expropriatory behavior of state elites, and institutional guarantees for individual and political rights are seen to enhance the power of civil society to organize against despotic state behavior. Leaders in autocratic regimes are claimed to have no way to make a credible commitment to private property rights because there is no one who can force them to keep their commitments (Olson, 1993). Other widely studied institutional explanations for economic development are also sometimes theorized to affect economic development through private property rights security. Corruption is, for example, claimed to affect private property rights security, particularly when the judiciary oversight over bureaucrats is poorly institutionalized (Keefer and Knack, 1997; Hall and Jones, 1999). Other studies focus on the effect of political instability such as coups, revolutions and political assassinations (Mauro, 1995; Barro, 1991). The focus in this literature is generally on the (expected) length of a ruler’s tenure. The logic is that leaders who fear replacement are more likely to expropriate because they expect to bear fewer of the future costs of their current expropriatory actions (Clague et al., 1999; Knack and Keefer, 1995; Olson, 1993).

countries institutions that protect citizens from abuse of power by the executive and secure private property rights; and (3) these differences in institutions, partly caused by European colonial policy as a function of disease environments, persist until today.

AJR (2001) find a strong relationship between European settler mortality rates in the 17th to 19th century and GDP per capita PPP in 1995 and imply (by their empirical strategy) that the only way to explain this finding is through the varying degrees of checks-and-balances and private property rights security introduced by institutions set up by European colonizers.

While AJR (2001) use the average risk of expropriation of foreign-owned assets between 1985 and 1995 (from the International Country Risk Guide database) as their measure of (general) private property rights security, Acemoglu and Johnson (2005) show that Polity IV's constraints on the executive variable can also be instrumented by 17th to 19th century European settler mortality rates.⁹

3 Reassessing the Korean Natural Experiment.

The Korean case is certainly insightful when thinking about economic growth because it highlights the importance of institutions and policies as opposed to other commonly expressed explanations for cross-country differences in economic development, such as: geography, climate and cultural values related to work (which arguably are, or at least were before South Korea's development took off, equivalent across the two countries).

I argue, however, that the Korean experience cannot be interpreted as evidence for the *type* of institutions and policies that constrain despotic state power and provide security to private property rights. This is so because: (1) the South Korean government during its country's growth miracle, the 25-years from 1963 to 1987, actively and openly violated the private property rights of many enterprises across a wide range of different sectors.¹⁰

⁹Rodrik, Subramanian and Trebbi (2004) replicated AJR's (2001) analysis using the rule of law index from the World Governance Indicators dataset and confirmed their conclusions. This variable arguably suffers from low measurement validity, however, given that the index includes many different variables that do not clearly measure the same underlying concept.

¹⁰During this period South Korea's GDP per capita PPP expanded on average with 6.88% per year (as

Importantly, the corporations with the most insecure property rights throughout this period, the so-called “priority sectors”, which were regularly subject to forced mergers, arbitrary rule changes, confiscatory taxation and deprivation of credit by the nationalized banking sector, were at the centre of South Korea’s industrialization and still form the major industries in South Korea today (this includes the electronics-, shipbuilding-, automotive-, petrochemical- and steel industries); and (2) South Korea only developed substantial institutional constraints on its executive subsequent to the legislative election of 26 April 1988, well *after* it developed economically in the preceding two and a half decades.

3.1 Private Property Rights Security in South Korea

While it is true that North and South Korea did start from similar income levels (North Korea was in fact a bit richer and more industrialized initially in 1945), and obviously share the same cultural heritage and geography, it is not true that the only things that have come to vary between the two current countries since 1945 are: (1) economic growth rates; (2) the level of private property rights security; and (3) the level of institutional constraints on despotic state power. In fact many variables have changed drastically between the two places over time, several of which could also explain the stark difference in outcome. This includes the international environment (North-Korea being aligned with the Soviet Union and China, South-Korea being supported by the U.S. and Japan) and the policies they implemented after 1953 (South Korea, after the take-over of power by general Park Chung-Hee in 1961, focused on export-oriented industrialization, while North-Korea focused on autarky and military-development based on the philosophy of *Juche* and *Songun*).

More importantly, however, the South Korean government throughout South Korea’s period of rapid economic development repeatedly and openly violated the property rights of many key companies. One of the first political-economic moves of the Park government, compared to 1.27% in the period from 1953 to 1962). After 1987 South Korea’s growth rate decreased significantly but still remained unusually high by international standards (5.96% per year) until 2002. From 2003 to 2011 South Korea grew on average 3.26% per year (author’s own calculation based on Penn World Tables GDP data).

which came to power via a military coup in 1961, was to fully nationalize the South Korean banking sector.¹¹ The Park government used the nationalized banking system to direct investments and to force the behavior of “priority sectors” in line with government five-year plans (FYP). Most of Korea’s current major industries have been designated as “priority sectors” in FYP’s at some stage during 1963-1991.¹² Enterprises in these sectors were subject to massive state control over the use and development of technology, lost the autonomy to set their own prices, and were subject to detailed state planning with regard to investment. Violators of such restrictions were punished with the revocation of licenses, withdrawal of credit contracts, identification and heavy punishment of tax law violations previously left unscrutinized, fines, implicit threats of withdrawal or actual withholding of previously attained privileges, expropriation, forced merger with other companies, and in extreme cases prison sentences (Chang, 1996; Jones and Sakong, 1980; Leipziger, 1988). Promoted industries were subject to regular review of investment decisions and were required to report monthly not just their export performance but all information regarding their business decisions and performance (Jones and Sakong, 1980).

The South Korean government reserved significant bureaucratic discretion with regard to the implementation and enforcement of the existing rules, creating a constant insecurity for enterprises with regard to their market- and capital positions. The eligibility criteria were deliberately made vague enough for any industry to qualify and rules were regularly enforced or left unenforced for political reasons (Chang, 1996). Jones and Sakong (1980) literally call the political situation in South Korea from 1961 to 1980 *the rule of man* rather than *the*

¹¹To highlight the importance of this Jones and Sakong (1980, 110) note that: “In Korea, the chaebol groups are young, rapidly growing, and heavily leveraged so credit is not only for expansion but for survival.” and that “The knowledge that the government can cut off the credit tap at anytime is sufficient for the operation of partial mutuality. The threat need only be carried out occasionally. Recognizing the importance of this mechanism is central to understanding how business-government relations work in Korea.” (p. 109)

¹²The First FYP (1962-6) designated cement, fertiliser, and oil refining as “basic” industries. Chemicals, steel and machinery were priority sectors in the Second FYP (1967-71). During the Third and Fourth FYP periods (1972-81), especially through the Heavy-Chemical Industry Drive (HCI) programme (announced in 1973), non-ferrous metals, shipbuilding and electronics were added to the Second FYP’s list of priority sectors. The practice continued in the Fifth and Sixth FYP periods (1982-91), during which machinery, electronics, automobile, chemical, shipbuilding and various high-tech industries (semiconductor, new materials, biotechnology) were categorized as priority sectors (Chang, 1996).

rule of law and provide an illustrative example with regard to tax enforcement:

“Suppose the government has made a company aware of its patriotic duty to contribute a little extra to national defense in a time of national crisis. Suppose further that the company ignores its duty. It is then imaginable that the company may appear on the select list of those to be investigated. Good and sufficient grounds will undoubtedly be found for penalizing the firm for non-compliance with non-discretionary tax laws, but the managers will be excused for believing that they are really being penalized for ignoring a command. More important, other owners may have their patriotic conscience raised by the example.” (Jones and Sakong, 1980, 115)

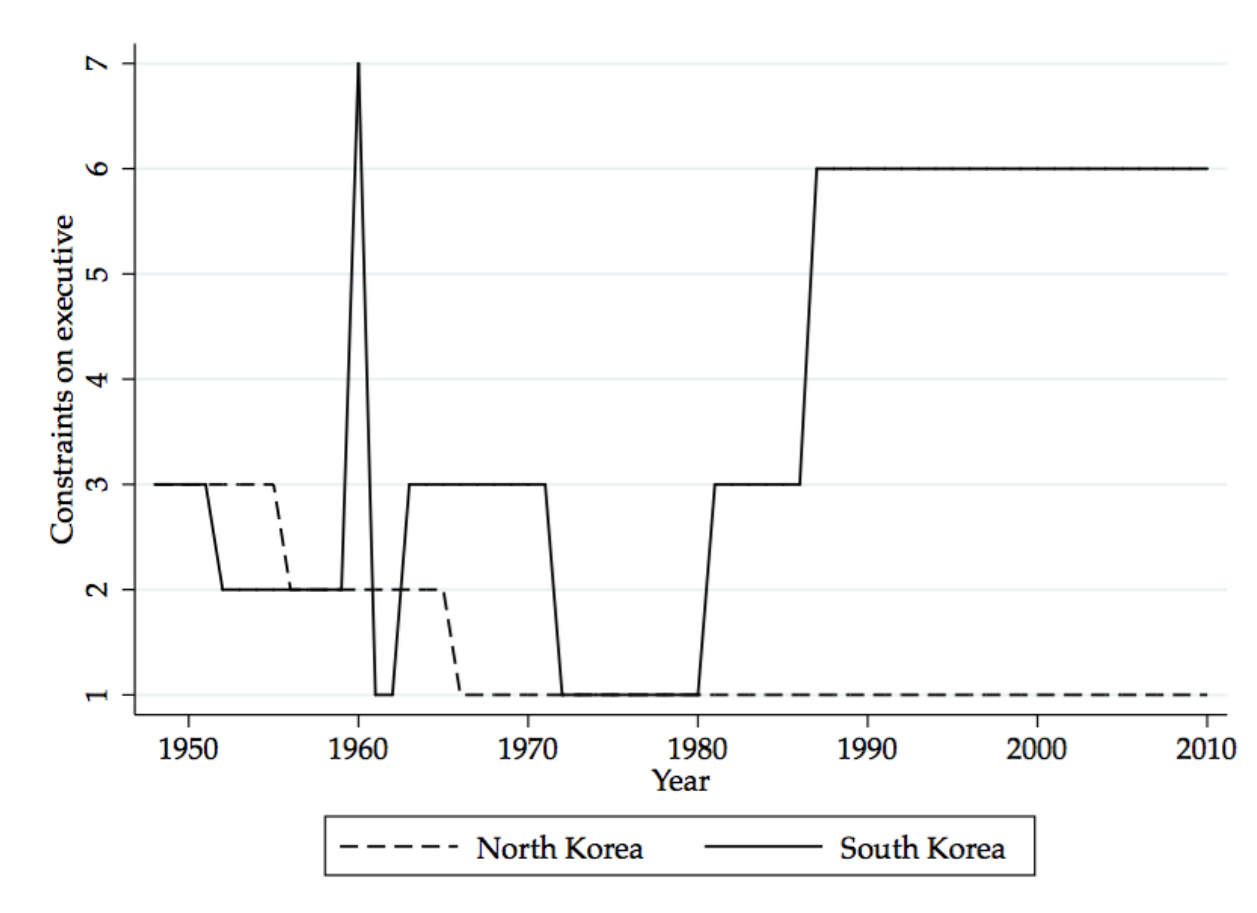
Besides strongly influencing the allocation of resources through its full control over the banking sector and near to full control over the behavior of individual private enterprises, the South Korean state itself owned various strategic industries, including: oil-refining, coal (partly), gas, electricity, fertilizer and steel (Chang, 1996). Jones and Sakong (1980, 297) note with regard to public ownership during South Korea’s growth miracle that: “[...] despite a rhetorical commitment to private enterprise, public ownership has been used to an extent that parallels that of many countries advocating a socialist pattern of society.”

3.2 Despotic State Power in South Korea

Taken together it seems hard to argue that private property rights were particularly secure during South Korea’s period of rapid industrialization. Perhaps even more important, however, South Korea industrialized well *before* it institutionalized substantial constraints on despotic state power.¹³ Before 1988 South Korea had levels of constraints on despotic state power that were similar (and sometimes lower) than North Korea (see figure 1). Although the absence of an effective legislative and judiciary body in South Korea during its growth

¹³Note that this has been pointed out before by Glaeser et al. (2004).

Figure 1: Constraints on despotic state power in North and South Korea from 1950 to 2010.



Notes: Constraints on the executive as measured by Polity IV (ranging from 1-7, 7 being most constraint).

miracle period (1963-1987) has been pointed out on numerous occasions and is uncontroversial among historians specialized in South Korea (such as: Seth (2016), Pratt (2007), Peterson (2009)) I provide a short summary of South Korea's political history from 1961 to 1996 in appendix A. This qualitative-historical evidence is in line with the levels and trends displayed in figure 1.

Based on the previous section, figure 1, and appendix A I conclude that South Korea developed under a highly authoritarian state that had little to no respect for private property rights. This does not mean that South Korea necessarily developed *because* it had such an unconstrained executive which violated private property rights on a large scale, or that

other countries should try to develop their economy through such measures. It does mean, however, that the South Korean case cannot be seen as providing evidence for (and is in fact important evidence against) the claim that the institutions that constrain despotic state power and provide security to private property rights are necessary ingredients for economic development. This is in contrast to what the current literature suggests.¹⁴

4 Reassessing the OLS evidence

Naturally little can be said about the economic effect of institutions that constrain despotic state power and provide security to private property rights on the basis of the case of South Korea alone. Therefore I follow the existing literature by studying the simple OLS relationship between constraints on despotic state power, private property rights security, and economic development in a large cross-section of countries.¹⁵

If it is true that private property rights security is an important cause of economic development and that private property rights security is in turn determined by the extent to which a country's institutions constrain the despotic power of its state executive we would expect to find the following correlations: (1) countries with more secure private property rights are richer; (2) countries with more constraint executives are richer; and (3) countries with more constraint executives have more secure private property rights.

In sharp contrast, I find that: (1) more secure private property rights is *only* associated with higher levels of GDP per capita PPP among high income countries; (2) Polity IV's constraints on the executive variable is not associated with GDP per capita PPP when used on its proper, ordinal, measurement level. When excluding the effect of category 7 (on a scale from 1 to 7, 7 being most constraint) its effect on income is in fact negative; and (3) only category 7 of Polity IV's constraints on the executive variable is significantly associated

¹⁴The form and implementation of South Korean industrial policy, rather than the institutions related to executive power and private property rights, are seen by many South Korea specialists as the prime reason for its rapid development (Amsden, 1989; Chang, 1996, 1993; Wade, 1990).

¹⁵I study all countries for which data is available.

with more secure private property rights.

In the following section I shortly discuss the data which I use to measure economic development, constraints on despotic state power, and private property rights security. Subsequently I examine each association individually.

4.1 Data

All the data that I use can be considered standard in the existing literature; which typically measures economic development through GDP per capita at purchasing power parity (PPP), private property rights through the use of citizen/expert survey data, and constraints on despotic state power through the expert coding of the Polity IV project.¹⁶

For GDP per capita PPP data I rely on the World Bank Development Indicators database. The data refer to the year 2013.¹⁷ In appendix C I replicate all results with Penn World Tables' real GDP per capita data from 2011, and find identical results.¹⁸ All independent variables are always measured in the same year as the GDP data.

There are several datasets available for the measurement of private property rights security. In the main text I report the results when private property rights is measured by data from the Heritage Foundation Index of Economic Freedom. The variable combines (existing) survey data on physical property rights, intellectual property rights, strength of investor protection, risk of expropriation, and the quality of land administration. It accounts for both the possibility that private property is expropriated by the state, and that private property rights are violated by other citizens.¹⁹ It also incorporates the degree to which the judiciary functions independently from the executive, the degree of corruption within the judiciary, and the ability of individuals and businesses to enforce contracts. The variable ranges from

¹⁶See appendix B for the descriptive statistics of all data used.

¹⁷These data are in constant 2011 international dollars.

¹⁸These data are in constant 2005 US dollars.

¹⁹I choose to take this comprehensive measure of private property rights security rather than one focused only on government expropriations (as, for example, AJR (2001)) because there is no theoretical reason to expect that state violations of private property rights are more or less detrimental for an individuals' incentive to invest than such violations by non-state actors.

0 to 10, higher scores meaning more secure private property rights. As a robustness check I replicate my results with three other commonly used measures of private property rights security: government expropriation without adequate compensation from the World Justice Project, private property rights security as measured by the Bertelmann Transformation Index (BTI), and contract viability and risk of expropriation as measured by the International Country Risk Guide of Political Risk Services. These exercises yield similar results as those reported below (see appendix D).

I measure constraints on despotic state power by Polity IV’s “constraints on the executive” variable. This variable measures, on a scale from 1 to 7 (7 meaning most constraints), to what extent there exist regular limitations on the executive’s actions exercised by (an) independent accountability group(s). These accountability groups can be independent legislatures or judiciaries, but can also be a ruling political party that has gained power through regular free and competitive elections and has effective authority over the selection and behavior of the state executive. This measure is the most commonly used variable in the existing literature and is specifically mentioned by Acemoglu and Johnson (2005) as the best measure available for measuring constraints on despotic state power. As a robustness check I replicate my results with two alternative measures of institutions constraining despotic state power: constraints on the government as measured by the World Justice Project and (liberal) democracy as measured by the interpolated polity measure of Polity IV/Freedom House. These exercises yield similar results as those reported below (see appendix F).

4.2 Private Property Rights Security and Economic Development

I study the relationship between the security of private property rights and economic development by estimating (cross-sectional) OLS regression models of the form:

$$\ln(Y)_i = \beta_0 + \beta_1 M_i + \epsilon_i \tag{1}$$

Where $\ln(Y)$ is the natural log of GDP per capita PPP in the year 2013, in country i . M is private property rights security as measured by the Heritage Foundation Index of Economic Freedom, in country i . And ϵ is a standard error term which is assumed to be independently distributed from all regressors with a mean of 0. I study the association between private property rights security and GDP per capita PPP in the full sample of 170 countries for which data is available, and when restricting the sample to only low, middle, and high income countries.²⁰

Column (1) in table 1 shows that private property rights security is indeed positively associated with income levels, at least among the 170 countries included in this sample. The model predicts that a one standard deviation (or, a 2.4 scale point) increase in the security of private property rights (measured on a scale from 0 to 10, 10 being most secure) will lead, on average, to a 0.801 increase in the natural log of GDP per capita PPP. According to this bivariate specification differences in the level of private property rights security alone are able to account for 43.2% of all differences in income levels across countries.

Importantly, however, column (2) and (3) in table 1 show that more secure private property rights are *not* associated with higher levels of income within the group of low and middle income countries (although the effect remains weakly positive). Among the 121 low and middle income countries included in the sample the effect of private property right security on GDP per capita PPP falls with more than a factor 4, is statistically insignificant at the 5% confidence level and explains less than 2% of all differences in income levels. Even among the 49 high income countries included in table 1 the effect of private property

²⁰These income groups are coded on the basis of the position of each country in the 2017 World Bank income group classifications, which are available at: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519>. I have merged the lower and higher middle income countries into one category. This provides me with three categories: (1) low income countries defined as having a 2017 GNI per capita of \$1,025 or less (N = 30); (2) middle income countries defined as having a 2017 GNI per capita of between \$1,026 and \$12,475 (N = 108); and (3) high income countries defined as having a 2017 GNI per capita of more than \$12,475 (N = 79). Note that, as could be expected given these wide ranges, there still exists significant variation in GDP per capita PPP within these three groups (the standard deviation of the log of my GDP per capita PPP data is 0.407 in the low income group, 0.714 in the middle income group, and 0.515 among high income countries. These standard deviations in absolute terms amount to \$460, \$5,188, and \$20,526 respectively).

Table 1: Income levels regressed on private property rights security.

	(1)	(2)	(3)	(4)
Sample:	Full	Low income	Middle income	High income
Property rights	0.801*** (0.0617)	0.112 (0.233)	0.174 (0.101)	0.183* (0.077)
Constant	9.276*** (0.0648)	7.291*** (0.212)	9.078*** (0.075)	10.298*** (0.105)
Observations	170	26	95	49
Adjusted R-squared	0.432	-0.029	0.016	0.074

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Bank's World Development Indicators). Property rights is private property rights security (standardized) as measured by the Heritage Foundation Index of Economic Freedom (higher scores mean more secure private property rights). Income group classifications are based on the 2017 World Bank income group categorization.

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

rights security on GDP per capita PPP decreases with more than 0.600 scale points, is only statistically significant at the 5% confidence level, and explains less than 7.5% of differences in income levels.

These results suggest that the estimate in column (1) of table 1 is (for a large part) invalid due to omitted variable bias; high income countries differ from developing countries on many other characteristics besides the security of private property rights, at least some of which appear to be correlated with both the security of private property rights and GDP per capita PPP, thereby leading to an overestimation of the independent effect of private property rights security.

The important conclusion to draw from this finding is that the security of private property rights security is, at best, a good explanation for differences in economic development between already rich countries (although the results in table 1 do, of course, only establish correlation, not causation), and that private property rights security is not a strong explanation for economic *under*development. In the absence of a strong and statistically significant correlation between more secure private property rights and higher levels of GDP per capita PPP among low and middle income countries, it seems highly unlikely that introducing more

secure private property rights on lower stages of economic development will lead to better economic performance.

4.3 Despotic State Power and Economic Development

To study the relationship between institutions that constrain despotic state power and economic development I run OLS regressions of the form:

$$\ln(Y)_i = \beta_0 + \beta_1 X_i + \epsilon_i \quad (2)$$

Whereby $\ln(Y)$ is the natural log of GDP per capita PPP in 2013, in country i . And X is constraints on the executive as measured by Polity IV, in country i .

Table 2 reports the results. Column (1) indicates that constraints on the executive is indeed positively related to income levels if we treat it as an interval variable (as in: AJR (2001), Acemoglu and Johnson (2005) and Knack and Keefer (1997)). In that specification a one standard deviation (or, a 1.9 scale point) increase in constraints on the executive (measured on a scale from 1 to 7, higher scores meaning more constraints on the executive) leads, on average, to a 0.277 increase in the log of GDP per capita PPP. The model estimates that differences in the extent to which the executive is institutionally constraint are able to account for approximately 2.5% of all differences in income levels among the 150 countries included in the sample.

It is important to realize, however, that Polity IV's constraints on the executive variable is *not* measured on an interval level (see appendix E for the full codebook). It consists instead of four substantive categories (1, 3, 5, and 7) and three so-called "intermediate" categories. Considering its coding it cannot be assumed that the distances between each category are equal, which adding them to the equation as an interval variable would imply. Using all seven categories as dummies (i.e. using the "intermediate" categories as independent categories) also raises problems since some categories have very few observations (category 1 has, for

Table 2: Income levels regressed on constraints on the executive.

Sample:	(1)	(2)	(3)	(4)	(5)
	Full	Full	Low income	Middle income	High income
Constraints on executive (1-7)	0.277* (0.139)				
Constraints on executive = 3-4		-0.576 (0.382)	-0.178 (0.117)	-0.041 (0.282)	0.218 (0.267)
Constraints on executive = 5-6		-0.920** (0.324)	-0.372* (0.156)	-0.277 (0.248)	-0.492 (0.265)
Constraints on executive = 7		0.393 (0.308)	-0.267** (0.089)	-0.233 (0.267)	-0.524 (0.268)
Constant	8.999*** (0.145)	9.396*** (0.282)	7.488*** (0.089)	9.195*** (0.220)	10.953*** (0.261)
Observations	150	150	24	82	44
Adjusted R-squared	0.025	0.204	-0.017	-0.010	0.255

Notes: 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 2013, measured in constant 2011 international dollars (from the World Bank’s World Development Indicators). Constraints on executive is constraints on the executive as measured by Polity IV (higher scores mean more constraints on the executive). Constraints on executive (1-7) is standardized. Reference category in column (2) – (5) are categories 1 and 2 of the original constraints on the executive variable. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

example, only 7 observations, category 4 has only 10) so that regression coefficients are likely to be overly sensitive to outliers.

Column (2) in table 2 therefore adds the variable transformed into four groups (each “intermediate” category is included with the category preceding it, category 7 – being the largest – is used as an individual category of 61 observations). In the models the lowest two categories of the original variable are used as the reference group. The results of this exercise show that all of the effect of column (1) is driven by the top category 7 (i.e. the countries with the most constraint executives). In contrast to what the constraints on despotic state power hypothesis would predict countries in categories 3 and 4, and countries in categories 5 and 6 are *poorer* than countries in the lowest two categories (i.e. the countries with the least constraint executives).

Even the positive effect of category 7 changes sign and becomes negative when studying

the effect only among countries at similar development levels (columns (3) to (5)). The results suggest therefore that category 7 in column (2) is simply functioning as a proxy for unobserved omitted variables which vary between income groups (held constant in column (3) to (5)) and that constraints on the executive does not have much effect on its own. If it does have an effect at all it is likely to be a negative effect given that countries in categories 3 and 4, 5 and 6, and countries in category 7 are generally poorer than countries with less constraint executives. The important conclusion to draw from this finding is that introducing more constraints on despotic state power is unlikely to lead to better economic performance.

4.4 Despotic State Power and Private Property Rights Security

To see to what extent countries with institutions that put more limits on despotic state power have more secure private property rights I estimate the following equation using OLS:

$$M_i = \beta_0 + \beta_1 X_i + \epsilon_i \quad (3)$$

Whereby M is the level of private property rights security, in country i . And X is the level of constraints on the executive, in country i .

The results are reported in table 3. Similar to the results in table 2, Polity IV's constraints on the executive variable is positively correlated with private property rights security when used (incorrectly) as an interval variable (column (1)), but when used on its proper, ordinal, measurement level it becomes clear that all of this significant positive effect is driven by the top category 7. Countries in categories 3 and 4, and countries in categories 5 and 6 do not have significantly more secure private property rights as compared to countries in categories 1 and 2 (although the effect is, in line with the existing literature, positive). Among low income countries more constraints on the despotic power of state executives is not significantly associated with more secure private property rights. Within middle and high income countries, only countries in the top 3 categories of the original constraints on

Table 3: Private property rights security regressed on constraints on the executive.

Sample:	(1) Full	(2) Full	(3) Low income	(4) Middle income	(5) High income
Constraints on executive (1-7)	0.620*** (0.092)				
Constraints on executive = 3-4		0.112 (0.212)	0.313 (0.226)	0.161 (0.192)	0.470 (0.508)
Constraints on executive = 5-6		0.251 (0.179)	0.289 (0.253)	0.519*** (0.146)	0.887** (0.283)
Constraints on executive = 7		1.377*** (0.200)	0.417 (0.215)	0.787*** (0.173)	0.887** (0.265)
Constant	-0.579*** (0.080)	-0.845*** (0.155)	-1.158*** (0.215)	-1.110*** (0.117)	0.251 (0.237)
Observations	155	155	25	85	45
Adjusted R-squared	0.238	0.347	-0.057	0.191	0.077

Notes: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is private property rights security (standardized) as measured by the Heritage Foundation Index of Economic Freedom (higher scores mean more secure private property rights). Constraints on executive is constraints on the executive as measured by Polity IV (higher scores mean more constraints on the executive). Constraints (1-7) is standardized. Reference category in column (2) – (5) are categories 1 and 2 of the original constraints on the executive variable. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

the executive variable do have significantly more secure private property rights as compared to countries in the lowest two categories.

Taken together the results suggest that more constraints on despotic state power do *not* in general lead to more secure private property rights. Among middle and high income countries there could be a threshold effect (although one cannot say this with much certainty based on these bivariate associations alone), whereby private property rights are not significantly more secure when introducing a few extra institutional constraints on a (still) generally unconstrained executive, but private property rights security do become significantly more secure once political systems manage to introduce institutions that more severely constrain despotic state power.

5 Reassessing the IV evidence

AJR (2001) and Acemoglu and Johnson (2005) were well-aware of the risk of endogeneity introduced by omitted variable bias (i.e. variables that are both associated with constraints on the executive/private property right security and economic development) and/or reversed causality (i.e. economic development leading to more constraints on the executive/more secure private property rights, rather than visa versa) in studying the OLS relationship between institutions that constrain despotic state power and provide security to private property rights and economic development. For the same reasons that rejections of nul-hypotheses based on OLS models with endogenous regressors might be invalid, also acceptances of null-hypotheses (as in the three sections above) might suffer from the same problem.²¹

In an effort to overcome these problems AJR (2001) and Acemoglu and Johnson (2005) use European settler mortality from the 17th to 19th century as an instrument for institutions that constrain despotic state power and provide security to private property rights. The validity of their approach is contingent upon three conditions: (1) European settler mortality is not itself determined by GDP per capita PPP; (2) European settler mortality is not simultaneously determined with GDP per capita PPP by an unobserved confounding variable; and (3) European settler mortality is *only* related to currents levels of GDP per capita PPP *through* its effect on constraints on despotic state power/private property rights security (i.e. the “exclusion restriction”).

Although the validity of an instrument can never be fully assessed on the basis of data (given that conditions (1) and (2) have to assumed) one can, at least to some extent, study empirically whether the effect of European settler mortality is *only* associated with current

²¹In fact, endogeneity might be so large as to change the direction of regression coefficients completely. It is theoretically possible, for example, that the lack of correlation between constraints on the executive, private property rights security, and GDP per capita PPP is due to an unobserved suppressing variable, which when properly accounted for would leave a positive effect between institutions that constrain despotic state power, institutions that provide security to private property rights, and economic development. It is also possible that the hypothesized associations exist and are causal in the real world, but that these effects are not observed in statistical models because the regressors’ coefficients are biased down due to (random) measurement error in Polity IV’s constraints on the executive and Heritage Foundation’s private property rights security variables (i.e. attenuation bias).

income levels through its effect on institutions that constrain despotic state power and secure private property rights. This is of interest here because it is not obvious that European settler mortality, and the settlement decisions that were partly determined by it, has affected differences in economic development today through (only) the type of institutions that constrain despotic state power and provide security to private property rights.

European settler colonies might, precisely because Europeans were given the disease environment able to settle there, differ from non-settler colonies on many institutional factors besides the type of institutions that constrain despotic state power and secure private property rights. Settler colonies like the United States, Canada, Australia, and New Zealand have, for example, also developed institutions that generate more state capacity (i.e. the capacity to effectively implement and enforce state policies), as compared to the institutions that many non-settler colonies inherited from the Europeans. State capacity is in itself an important determinant of economic development, and is also strongly associated with private property rights security (van Noort, 2017). The lack of controls for state capacity could therefore cause both a violation of the exclusion restriction and explain the omitted variable bias suggested by the results discussed above.

Variables causing a violation of the exclusion restriction could also be non-institutional in nature. Europeans who came to settle in the colonies of the New World might, for example, have brought not so much their institutions but their own human capital, which in itself could be an important determinant of ex-post economic outcomes. Glaeser et al. (2004) show in line with this argument that European settler mortality correlates even more strongly with human capital today and in 1900, as compared to current and historic levels of constraints on the executive, and that human capital performs better in instrumental variable regressions predicting economic growth than constraints on the executive does.²²

²²Droller (Forthcoming) studies variation in economic development within Argentina and demonstrates, while holding the effect of (national) political institutions and geography constant, that areas with a larger inflow of European settlers during the Age of Mass Migration (1850-1914) have higher levels of GDP and literacy rates today, and that high-skilled Europeans themselves played an important role in the onset of industrialization; owning most of the industrial establishments, and providing the majority of industrial labour. Easterly and Levine (2016) find, across countries, that possible adverse effects of extractive institu-

Non-settler colonies also typically gained independence, and therefore sovereignty over trade policies, much later than settler colonies did (although several Latin American settler colonies were forced to sign “unequal trade treaties” after formal independence in the beginning of the 19th century). Being a colony typically forced these countries into importing high-value manufactured products from Western Europe while exporting relatively low-value raw materials and agricultural products – a pattern which could have affected current levels of income, independent of institutions, through reduced historic opportunities for industrialization and path-dependent specialization into sectors with little room for productivity growth over time (Chang, 2007).

If any of these scenarios is a valid description of the European colonial era this would mean that European settler mortality is an invalid instrument for the type of institutions that constrain despotic state power and provide security to private property rights because the instrument would be related to current levels of income through channels other than its (possible) effect through despotic state power and private property rights institutions.

I now test directly whether European settler mortality is only related to current levels of GDP per capita PPP through its effect on institutions that constrain despotic state power and provide security to private property rights. I do this by estimating the following equations (separately) using OLS:

$$\ln(Y)_i = \beta_0 + \beta_1 \ln(Z)_i + \beta_2 M_i + \epsilon_i \quad (4)$$

$$\ln(Y)_i = \beta_0 + \beta_1 \ln(Z)_i + \beta_2 X_i + \epsilon_i \quad (5)$$

If it is true that (the natural log) of European settler mortality ($\ln(Z)$) is not itself caused by institutions that constrain despotic state power and provide security to private property rights, and is associated with current levels of income *only* through its effect on private property rights security, we would expect β_1 in equation (4) to be insignificant with a coefficient

tions associated with small European settlements were even at low levels of European settlement offset by other things that European brought, such as human capital and technology.

close to zero after controlling for private property rights security (M). Similarly, if (the log of) European settler mortality is associated with current levels of income *only* through its effect on institutions that constrain despotic state power (which in turn have affected private property rights security) we would expect β_1 in equation (5) to be insignificant with a coefficient close to zero after controlling for constraints on the executive (X).²³

The results in table 4 show that β_1 is in none of the cases close to zero and statistically insignificant. The instrument's coefficient, after controlling for constraints on the executive and private property rights security, remains strongly negative at -0.468 in the case of private property rights security, and -0.682 in the case of constraints on the executive, and is always statistically significant at the 1% confidence level. This suggests that European settler mortality is *not only* associated with today's cross-country differences in GDP per capita PPP through its effect on the type of institutions that constrain despotic state power and provide security to private property rights.

On the econometric level it is possible, however, that some of European settler mortality's effect on economic development is not reduced after including controls for institutions that constrain despotic state power and provide security to private property rights, because these institutions are likely to be measured with error. It is difficult to test this possibility empirically in the absence of more precise measures of despotic state power and private property rights security. I am able, however, to provide an estimate of how large such measurement error should be in order to account for the full effect of European settler mortality on GDP per capita PPP. In the case of private property rights security such measurement error should account for more than 59% of the bivariate effect of European settler mortality on GDP per capita PPP. For the more fundamental institutions that are seen to cause higher levels of economic development through providing more secure private property rights, the checks-and-balances that constrain despotic state power, this measurement error should even

²³Note that I do not control for M in equation (5), so that if in that specification β_1 is close to zero and insignificant, this cannot reflect a part of private property rights security that is not caused by constraints on despotic state power but is associated with historic levels of European settler mortality and economic development today.

Table 4: GDP per capita PPP regressed on European settler mortality while controlling for constraints on the executive and private property rights security.

	(1)	(2)	(3)	(4)	(5)	(6)
Log European settler mortality	-0.794*** (0.093)	-0.468*** (0.104)	-0.549*** (0.147)	-0.682*** (0.102)	-0.694*** (0.107)	-0.580*** (0.161)
Property rights		0.597*** (0.109)	0.182 (0.156)			
Equality of opportunity			0.573*** (0.152)			0.537** (0.183)
Prop X Equality			0.064 (0.121)			
Constraints on executive = 3-4				0.036 (0.290)		
Constraints on executive = 5-6				0.214 (0.252)		
Constraints on executive = 7				0.636* (0.286)		
Constraints on executive (1-7)					0.345* (0.158)	0.092 (0.156)
Constraints X Equality						0.103 (0.165)
Constant	8.753*** (0.097)	8.971*** (0.079)	8.840*** (0.127)	8.516*** (0.197)	8.581*** (0.135)	8.754*** (0.150)
Proportion mediated	–	0.410	0.309	0.141	0.126	0.270
Observations	82	81	63	74	74	60
Adjusted R-squared	0.453	0.603	0.603	0.474	0.492	0.585

Notes: 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 2013, measured in constant 2011 international dollars (from the World Bank’s World Development Indicators). Log European settler mortality is the natural log of European settler mortality (standardized) as in AJR (2001). Property rights is private property rights security (standardized) as measured by the Heritage Foundation Index of Economic Freedom (higher scores mean more secure private property rights). Constraints on executive is constraints on the executive as measured by Polity IV (higher scores mean more constraints on the executive). Constraints (1-7) is standardized. Reference category in column (4) are categories 1 and 2 of the original constraints on the executive variable. Equality of opportunity (standardized) as measured by the Bertelmann Transformation Index (higher scores mean more equality of opportunity).

*** p<0.001, ** p<0.01, * p<0.05

account for more than 85% of European settler mortality’s independent effect on economic development (see proportion mediated in table 4). I regard it as highly unlikely that constraints on despotic state power and private property rights security are measured with such high degree of error, so that in the real world European settler mortality has only affected current economic outcomes through these type of institutions, while we are unable to observe this statistically.

AJR (2001, 2005) and Acemoglu and Robinson (2012) argue, however, that their theory does not only refer to the protection of private property rights but rather to a “cluster of good institutions”, including, besides institutions that constrain despotic state power and provide security to private property rights, institutions that ensure equal opportunity for all citizens. Although they do not incorporate equality of opportunity in their empirical analysis the idea is here that constraints on the executive and private property rights security only have their large positive effects on economic development if they are accompanied with institutions ensuring equal opportunity for a large cross-section of the society. Model (3) and (6) in table 4 therefore add a measure of equality of opportunity interacted with private property rights security or constraints on the executive to the model. This variable is taken from the Bertelmann Transformation Index and asks survey respondents to rank the degree of equality of opportunity in their country on a scale from 1 to 10. The results remain unchanged; European settler mortality’s negative effect on today’s income levels remains strong and highly statistically significant (this is also the case when equality of opportunity is included without an interaction term).

Overall, considering both the historical and statistical evidence, the results strongly suggest that the effect of European settler mortality is mediated *not only* through institutions that constrain despotic state power and provide security for private property rights, but also through other institutional and/or non-institutional factors. This means that AJR’s (2001) instrument cannot be used to obtain a valid estimate of the causal effect of these type of

institutions on GDP per capita PPP.²⁴ At the minimum, based on the existing evidence, it seems fair to say that one cannot conclude that the institution(s) that is/are (most) important for economic development are the specific institutions that constrain despotic state power and provide security for private property rights.

6 The Time Series Evidence

Unlike the existing literature I also study the economic effect of private property rights security and constraints on despotic state power over time. Time series analysis has obvious advantages over cross-sectional designs because omitted variables are more likely to vary between countries, as compared to within countries over time, and analysis over time enables the use of lagged independent variables which are better able to deal with the problem of reversed causality.²⁵ Time series analysis is severely limited, however, by the absence of reliable data on private property rights security from before 1995. Furthermore, the time series of both constraints on the executive and private property rights security exhibits little variation over time within countries. The estimation of time series models with country fixed effects is for this reason unlikely to provide reliable estimates. I therefore employ two alternative empirical strategies.

First, I see if private property rights security *levels* in 1995, 2000, and 2005 predict average growth rates (G) over subsequent 5 and 10 year time periods. I do this by estimating the

²⁴The results reported here are in line with the fact that AJR's (2001) own IV estimates are in most specifications more than twice as large as the OLS estimates. They defend this finding by referring to attenuation bias because historic levels of constraints on despotic state power and historic levels of private property rights security are important for current levels of income but are not perfectly correlated with current measures of such institutions. Although this is (econometrically speaking) possible, it seems unlikely that despotic state power and private property right institutions have varied so strongly in the past as to double the effect (in fact, AJR (2001) provide empirical evidence for the contrary in the case of constraints on the executive). If this would be the case, this would undermine AJR's (2001) case for the instrument's validity, given that this depends on the claim that the institutions harming or securing private property rights set up by colonists in the past persist until today.

²⁵This is so although the potential effect of economic development on political institutions is likely to be a slow-moving process which can only be captured by longer lags than the existing data allows.

following equation using OLS:

$$G_i = \beta_0 + \beta_1 M_{(t-1)i} + \beta_2 \ln(Y)_{(t-1)i} + \epsilon_i \quad (6)$$

With regard to constraints on despotic state power I see if levels of constraints on the executive are associated with subsequent 10 year growth averages over the 1960 to 2010 time period. I do this by estimating the following equation with OLS:

$$G_i = \beta_0 + \beta_1 X_{(t-1)i} + \beta_2 \ln(Y)_{(t-1)i} + \epsilon_i \quad (7)$$

In both models I control for initial income levels ($\ln(Y)_{(t-1)}$) to take into account the possibility that poorer countries have more “room” to grow (although growth rates and income levels do not generally converge across countries), and to control for omitted variables that vary across income levels.

Second, I use a most-likely case study design by analyzing changes in growth rates in countries that have experienced an exceptionally large (and sustained) change in private property rights security or constraints on the executive.²⁶ My empirical approach in both cases consists simply of comparing the average 10-year growth rate before and after an exceptionally large and sustained change in the level of private property rights security and constraints on the executive has taken place.

I define cases of exceptionally large and sustained changes in private property rights security as instances where: (1) the level of private property rights security has been stable for at least 3 years; (2) then the level of private property rights security changes at least 4 scale points (on a scale from 0 to 10) within 4 years.²⁷ Note here that the standard deviation of private property rights security is 2.40, which means that a change of 4 scale points in

²⁶In these designs the researcher selects cases whereby the hypothesis that is being tested is most-likely to hold. The logic is that if even in these cases one does not find affirmative evidence, the theory is unlikely to hold in general. See Flyvbjerg (2006) on most-likely case study designs.

²⁷This cut-off is selected because over this time period there are, by chance, no cases apparent that have experienced a sustained change of 3 scale points in any direction.

4 years is extraordinary large, so that if such a change is not followed by a clear change in growth rates in the expected direction, one might legitimately wonder what change in private property rights security would have a clear effect on economic growth; and (3) this level of private property rights security is then maintained, or changes even further in the same direction, for the rest of the observed period (until 2013).

I define cases of an exceptionally large and sustained change in constraints on despotic state power as: (1) countries that have experienced a change in the level of constraints on the executive of at least 4 scale points (on a scale from 1 to 7) within 4 years. Again, such a change should, assuming that the effect of despotic state power on economic development is large and causal, be followed by a clear change in growth rates in the expected direction; and (2) this level is then maintained, or changes further in the same direction over the subsequent 10 years, so that the score on the constraints on the executive variable in each of the 10 years after the change is always at least 4 scale points higher as the score in each of the individual preceding 10 years.²⁸

Table 5 reports the results of 5 and 10 year growth rates regressed on initial levels of private property rights security and constraints on the executive, while controlling for initial income levels. The results show that in all time periods since 1995 initial levels of private property rights security are negatively associated with subsequent growth rates. This means that countries with more secure private property rights have, at least over the time period from 1995 to 2010, tended to grow slower than countries at similar income levels with initially less secure private property rights. Similarly, countries with more constraint executives have tended to grow slower in the majority of decades since 1960. Only in the two decades from 1980 to 2000 have countries in the categories 3 to 7 of Polity IV's original constraints on the executive variable grown faster than those countries with the least constraint executives in categories 1 and 2.

²⁸I allow for the constraints on the executive variable to not be fully stable before the significant change occurs because, unlikely the short time series data available for private property rights security, I have in all cases enough data to observe the volatility over the whole 20-year time period.

Table 5: Income growth regressed on the initial level of private property rights security and the initial level of constraints on the executive (see time period in column headings).

	(1)	(2)	(3)	(4)	(5)
Sample:	1996-2005	2001-2010	1996-2000	2001-2005	2006-2010
Property rights (t-1)	-0.252 (0.311)	-0.821** (0.307)	-0.106 (0.426)	-0.915 (0.557)	-0.658* (0.293)
Log GDP per capita (t-1)	0.138 (0.335)	-0.122 (0.264)	0.435 (0.454)	0.304 (0.455)	-0.497 (0.364)
Constant	2.402*** (0.234)	2.795*** (0.221)	2.071*** (0.285)	3.082*** (0.322)	2.388*** (0.194)
Observations	94	152	94	152	149
Adjusted R-squared	-0.015	0.113	0.002	0.035	0.140
	(1)	(2)	(3)	(4)	(5)
Sample:	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010
Constraints on executive = 3-4 (t-1)	-0.848 (0.919)	-0.121 (0.764)	1.904** (0.684)	0.530 (0.953)	-0.932 (0.956)
Constraints on executive = 5-6 (t-1)	-0.283 (1.032)	-0.265 (1.340)	2.083* (0.874)	1.118 (0.908)	-0.518 (0.805)
Constraints on executive = 7 (t-1)	0.849 (0.951)	-0.350 (1.103)	2.900*** (0.777)	1.310* (0.726)	-0.505 (0.783)
Log GDP per capita (t-1)	-0.115 (0.312)	0.056 (0.605)	-0.524 (0.331)	-0.096 (0.312)	-0.526 (0.285)
Constant	3.130*** (0.776)	2.426*** (0.670)	-0.834 (0.491)	0.869 (0.717)	3.042*** (0.722)
Observations	57	106	117	119	146
Adjusted R-squared	0.024	-0.038	0.123	-0.009	0.024

Notes: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is GDP per capita growth. Data from before 1990 is real GDP per capita growth, measured in constant 2005 US dollars (from the Penn World Tables). Data from after 1990 is GDP per capita PPP growth, calculated from constant 2011 international dollars (from the World Bank's World Development Indicators). Property rights (t-1) is private property rights security levels (standardized) as measured by the Heritage Foundation Index of Economic Freedom, in the previous year (higher scores mean more secure private property rights). Constraints on executive (t-1) is constraints on the executive as measured by Polity IV, in the previous year (higher scores mean more constraints on the executive). Reference category is category 1 and 2 of the original constraints on the executive variable. Log GDP per capita (t-1) is the level of real GDP per capita or GDP per capita PPP, in the previous year.

*** p<0.001, ** p<0.01, * p<0.05

Table 6 reports the results with regard to the effect on economic growth of an exceptionally large and sustained change in private property rights security. In total three countries since 1995 have seen an exceptionally large and sustained positive change in private property rights security of 4 scale points within 4 years. These are: Barbados (1998-2001), Cyprus (1999-2001), and Malta (1998-2001). Of these three countries only Barbados has experienced a change in growth rates in the expected direction (the growth rate in the period 2002-2012 was 0.45% higher as compared to the period 1987-1997). Cyprus and Malta have, contrary to the hypothesis, both experienced a large decrease in growth rates after a significant increase in private property rights security (in both cases the growth rate in the decade after the significant and sustained change towards more secure private property rights was more than 2% lower as compared to the preceding decade).

Six countries have experienced an exceptionally large and sustained decrease in private property rights security since 1995. These are: Kuwait (2002-2004), Saudi Arabia (1999-2000), Pakistan (1998-1999), Namibia (2005), Philippines (2001-2004), and Argentina (2001-2003). Only Kuwait and Saudi Arabia have seen a change in their growth rates in the expected direction (both of which are decreases in growth rates of less than 0.50%). Pakistan, Namibia, Philippines, and Argentina have, contrary to the private property rights security hypothesis, experienced a substantial increase in growth rates after their level of private property rights security deteriorated significantly.²⁹

Table 7 reports the results with regard to the effect on economic growth of an exceptionally large and sustained change in constraints on the executive. Twenty-one countries have experienced a sustained increase in constraints on the executive of 4 scale points in 4 years since 1960. Of the twenty of these for which the Penn World Tables provides GDP per capita data, twelve, a little bit more than half, have experienced a subsequent increase in growth

²⁹All these results are substantively the same in all cases when excluding the years after 2007 (i.e. excluding the global economic crises years). Only in the case of Kuwait the difference in growth rates changes signs. The average economic growth rate from 2004 to 2007 in Kuwait was 3.83%, almost 5% higher than the economic growth rate in the decade before Kuwait's level of private property rights security deteriorated significantly between 2002 and 2004. Excluding the crisis years thus provides further evidence against the private property rights security hypothesis.

Table 6: Effect on 10-year growth rate of exceptionally large and sustained changes in private property rights security.

Country	Δ in X (year)	Growth (pre)	Growth (post)	Δ in growth
Barbados	+2 (1998); +2 (2001)	0.61	1.06	0.45
Cyprus*	+2 (1999); +2 (2001)	3.35	0.89	-2.46
Malta†	+2 (1998); +2 (2001)	4.66	1.42	-3.24
Kuwait	-2 (2002); -2 (2004)	-1.56	-2.05	-0.49
Saudi Arabia	-2 (1999); -2 (2000)	0.93	0.55	-0.38
Pakistan	-2 (1998); -2 (1999)	1.86	2.55	0.70
Namibia	-4 (2005)	1.76	2.85	1.09
Philippines	-2 (2001); -2 (2004)	0.55	3.49	2.94
Argentina	-2 (2001); -2 (2003)	2.39	6.44	4.05

Notes: Growth is 10-year GDP per capita growth. Data for changes in private property rights security from before 2000 is real GDP per capita growth, measured in constant 2005 US dollars (from the Penn World Tables). The last year included in the estimation of average ex post growth rates for changes in private property rights security that occurred before 2000 is 2011. Data for changes in private property rights security from after 2000 is GDP per capita PPP growth, calculated from constant 2011 international dollars (from the World Bank's World Development Indicators). The last year included in the post growth rates for changes in private property rights security that occurred after 2000 is 2013. Property rights is private property rights security levels as measured by the Heritage Foundation Index of Economic Freedom (measured from 0 to 10, higher scores mean more secure private property rights). Cases are selected if: (1) private property rights security is stable for at least 3 years; (2) then private property rights security changes in one direction, with at least 4 scale points, within 4 years; and (3) this level is then sustained, or private property rights changes further in the same direction for the rest of the observed period (until 2013).

* The level of private property rights security is not fully sustained in Cyprus for the rest of the time period. 9 years after the change in private property rights security from 5 to 9 occurred between 1999 and 2001, the level of private property rights security in Cyprus decreased from 9 to 8 in 2010 and decreased further from 8 to 7 in 2012.

†Private property rights security data for Malta in 1995 is missing. Therefore I observe in the case of Malta only if the level of private property rights security is stable in the two years preceding the significant change in private property rights security levels which started in 1998.

rates (a change in line with the constraints on despotic state power hypothesis). Contrary to the hypothesis, however, eight countries have experienced a *decrease* in economic growth rates after they experienced an exceptionally large and sustained increase in constraints on the executive (in all of these cases the growth rate decreased with more than 1% after the introduction of significantly more constraints on the executive).

Exceptionally large and sustained deteriorations in constraints on despotic state power have been much less common over the last 50 years. Only four countries since 1960 have experienced a sustained decrease of 4 scale points in 4 years, none of which occurred after 1980. For two of these cases, Guyana (1978-1980) and Myanmar/Burma (1962), the Penn World Tables does not provide GDP data. Of the remaining two cases one is in line with the constraints on despotic state power hypothesis and one is evidence against it. Panama has grown 0.03% slower in the 10 years after 1968, when its constraints on the executive score decreased with 4 scale points in one year. In Brazil, in contrast, the significant decline in constraints on the executive in the first half of the 1960s was followed by a decade of 2.22% higher economic growth (as compared to the average growth rate from 1950-1960).

In sum, the time series evidence suggests: (1) that higher levels and/or exceptionally large and sustained increases in private property rights security are generally associated with *lower* economic growth rates; and (2) that higher levels and/or exceptionally large and sustained increases in constraints on the executive are *not* clearly associated with higher, or lower, economic growth rates.

The time series evidence also provides little support for the claim that changes in private property rights security are caused by changes in institutional constraints on despotic state power; none of the cases of exceptionally large and sustained changes in private property rights security reported in table 6 are preceded, or coincide, with exceptionally large and sustained changes in constraints on the executive, as reported in table 7.

Table 7: Effect on 10-year growth rate of exceptionally large and sustained changes in constraints on the executive.

Country	Δ in X (year)	Pre-growth	Post-growth	Δ in growth
Albania	+2 (1990); +2 (1992)	0.53	7.00	6.47
Nigeria	+4 (1999)	1.06	5.75	4.69
Chile	+5 (1989)	1.95	4.38	2.44
Uruguay	+4 (1985)	0.89	3.29	2.39
Brazil	+3 (1985); +1 (1988)	1.89	0.19	2.22
Cent. Afr. Rep.	+4 (1993)	-1.88	0.34	2.21
Philippines	+5 (1987)	-0.38	0.94	1.32
Argentina	+6 (1983)	-0.42	0.86	1.29
Benin	+4 (1991)	0.96	1.84	0.88
Mali	+4 (1992)	1.44	2.06	0.62
Hungary	+4 (1990)	1.72	2.11	0.40
Zambia	+4 (1991)	-1.58	-1.22	0.36
Mongolia	+2 (1990); +2 (1992)	3.26	2.16	-1.11
Spain	+6 (1978)	3.89	2.03	-1.87
Bolivia	+6 (1982)	1.20	-0.77	-1.96
Portugal	+5 (1976)	5.03	2.41	-2.62
Paraguay	+2 (1989); +4 (1992)	2.07	-0.62	-2.70
Thailand	+4 (1992)	5.83	2.93	-2.90
Bulgaria	+4 (1990)	4.07	0.21	-3.86
Peru	+5 (1980)	1.08	-3.06	-4.14
Guyana	+4 (1992)	N/A	N/A	N/A
Panama	-4 (1968)	3.48	3.45	-0.03
Brazil	-1 (1961); -1 (1963); -2 (1965)	3.78	6.00	2.22
Guyana	-1 (1978); -4 (1980)	N/A	N/A	N/A
Myanmar	-6 (1962)	N/A	N/A	N/A

Notes: Growth is 10-year GDP per capita growth. Data is real GDP per capita growth, measured in constant 2005 US dollars (from the Penn World Tables). Constraints on the executive as measured by Polity IV (measured from 1 to 7, higher scores mean more constraints on the executive). Cases are selected if a country has experienced a change in constraints on the executive whereby in each of the 10 consecutive years Polity IV's constraints on the executive score is 4 points higher as compared to each individual year in the 10 years preceding it. N/A indicates that GDP data is not available.

7 Discussion and Conclusion

This paper has reassessed the evidence for the claim, underlying much of modern growth theory, that private property rights security is central to explaining cross-country differences in economic development and that differences in private property rights security are in turn caused by differences in the extent to which a country's political system is able to institutionally constrain the despotic power of its state executive.

I conclude that the existing literature with regard to the causes and effects of private property rights security claims substantially more than the underlying evidence can sustain. First, the Korean “natural experiment”, which is regularly cited as evidence in favor of the importance for economic development of the type of institutions that constrain despotic state power and secure private property rights, is in fact important evidence against these claims. The South Korean government was highly *unconstrained* and despotic throughout South Korea's period of most rapid economic growth (1963-1987). During this period private property rights in virtually all major industries, most of which still provide the backbone of South Korea's economy today, were openly and frequently violated. When South Korea did develop institutions that substantially constraint the despotic power of its state executive, it did so in 1988, well *after* it already achieved average GDP per capita PPP growth rates of about 7% per year over the preceding 25-year period. Second, the main prediction of the private property rights security hypothesis – that countries that have more secure private property rights are on average richer than countries with less secure private property rights – only holds within the group of countries that have *already* attained a high level of income. Third, Polity IV's “constraints on the executive” variable, the literature's indicator of choice for measuring constraints on despotic state power, is when used on its proper, ordinal, measurement level *not* correlated with levels of income and/or private property rights security. Fourth, AJR's (2001) European settler mortality instrument is likely to be invalid since it remains strongly correlated with GDP per capita PPP after controlling for private property rights security and constraints on the executive. Fifth, levels of constraints on the executive

and private property rights security *are not* correlated with subsequent growth rates. Last, exceptionally large and sustained changes in the level of constraints on the executive and private property rights security *are not* correlated with subsequent changes in growth rates.

Future research will have to establish why, at closer assessment, the type of institutions that constrain despotic state power and secure private property rights have little to no effect on economic development. Due to space limitations, I here discuss only two possibilities that I ought of greatest importance.

With regard to private property rights security it seems highly likely that a complete absence of private property rights security will strongly disincentive productive behavior. But while it seems reasonable to argue that complete and persistent uncertainty about the security of private property rights is harmful for long-term investment and growth, it is not likely that securing private property rights as strongly as possible has uniformly positive effects in all countries, at all times, and on all levels of development (Chang, 2011). While secure private property rights might cause better development outcomes under some conditions, in other cases they might actually serve vested interests and thus hamper technological change, social mobility, and ultimately economic growth. This might be especially the case in many of today's poor countries where power and wealth are distributed very unequally. On the theoretical level, Coase (1960) has shown that the initial distribution of property rights *does* have an effect on allocative efficiency if one assumes transaction costs to exist, which is necessary for institutions to be relevant (North, 1990). This is even the case when property rights are well-defined defined and perfectly enforced, and when assuming conditions of full market competition. This is because in a world with transaction costs not all socially optimal transactions (i.e. those exchanges that reallocate resources to agents who can use them more productively as compared to their initial owners) will occur due to the additional cost of transacting that is unrelated to the value of the good/asset itself.

Other important questions with regard to the private property rights security hypothesis are to what extent private property rights violations happen “often enough” and whether

investors react “strongly enough” to explain the large differences in income that we observe across countries today. Li (2009), Kobrin (1984) and Hajzler (2012) find that nationalizations and state expropriations of private property occur very rarely, and if they occur, typically occur only in a small set of countries in which they affect only a limited number of (generally foreign-owned) firms in specific sectors (mainly petroleum and mining).³⁰ Even in these cases investment is not reduced observably (Hajzler, 2012).³¹

With regard to the relationship between constraints on despotic state power and economic development future research would benefit of taking the possibility of reversed causality particularly seriously. Based on Polity IV’s constraints on the executive time series data one can say that: (1) in all cases of development success in the 19th century (Western Europe, the United States, Canada, New Zealand), with the exception of England and the United States (and possibly Canada and New Zealand for which data is lacking from before 1850), 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, *after* the Industrial Revolution had taken place in these countries³²; and (2) in all cases of development success

³⁰Focusing on the period from 1960 to 1976, when state expropriations were most common, Kobrin (1984) finds that less than 5 percent of all foreign-owned firms in developing countries experienced expropriation. That figure is likely to be substantially lower in recent decades. Guriev, Kolotilin and Sonin (2011), for example, study all cases of expropriation in the oil sector from 1960 to 2006 and find only 5 cases of government expropriation since 1981. Hajzler (2012) finds only 49 cases of (general) state expropriations from 1990 to 2006, 27 of which occurred in just 9 countries.

³¹There are also many significant historic and contemporary cases of extreme development success in contexts of significant private property rights violations. In the United States between 1870 and 1910 expropriation was commonly used as a public policy instrument to stimulate railroad construction, milling, and mining (Scheiber, 1973). During this period the North-American economy grew at its fastest rate in history, with real wages, wealth, GDP, and capital formation all increasing rapidly (Kennedy, 2010). In China, the biggest development success of today, land is not privatized and large-scale expropriation of private property happen on a regular basis (Whyte, 2009; Li, 2004). Rithmire (2017) finds that the Chinese Communist party has in recent years strengthened, rather than weakened, the institutions that permit land expropriations.

³²Even for England and the United States one can, based on historical accounts, doubt if effective constraints on despotic state power and private property rights security were institutionalized before the English (1760-1840) and American (1820-1870) Industrial Revolution. Far into the 19th and regularly 20th century both England and the United States struggled with widespread corruption and despotic application of state power; public offices in the judiciary and bureaucracy were sold to the highest bidder, the justice system heavily favored political- and economic elites, and the law was openly applied unequally according to class, gender, and race. Expropriation by the state or powerful private actors was common (see footnote 32). Furthermore, the selection of executives in both the United States and England was throughout the 19th century limited to (a small number of) property-owning white males. The political system did therefore not

in the 20th century, with the possible exception of Japan, substantial constraints on the executive also came *after* economic development (Korea, Taiwan) or did not institutionalize at all (China, Russia, Singapore, Hong Kong).

These results have large implications for current development practice and research. The vast majority of current growth theory assumes that the fundamental challenge for today's developing countries is to more effectively tie the hands of the Leviathan, so to avoid the state executive branch from retarding the allocation of resources brought forward by private agents through the market mechanism. Accordingly, the focus in much of contemporary development economics is on how to increase private property rights security in the developing world. The results reported in this paper question this theoretical focus and suggest that future research would benefit from also including more systematically other dimensions of (state) institutions and policies, some of which might be related to the violation of the individual right to fully autonomously allocate scarce resources, such as the provision of public goods and the implementation of industrial policy. On the policy side many countries have democratized and have managed to introduce substantially more constraints on their executive from the 1980s onwards. Although this is clearly an important human achievement, this has *not* led to higher economic growth rates. In fact, economic growth rates around the world, as well as in the developing world, were substantially higher in the period with “bad” institutions from 1950 to 1980, as compared to the period with substantially “better” institutions, from the 1980s onwards (Chang, 2014; Ben-David and Papell, 1998).³³ Without denying the importance of expanding individual political rights vis-à-vis despotic state power for the achievement of other human ends, developing countries will have to focus on introducing other types of institutions and policies to increase their economic growth rates.

hold the executive branch accountable to the interest of most of the population (Chang, 2002).

³³GDP per capita growth was approximately 3% between 1950 and 1973, double the rate achieved since the late 1970s (Rodrik, 2011). This is true even when including China, which substantially increases the average growth rate in the period after 1980 while China has institutions that do not provide much security to private property rights and put little constraints on the despotic power of the Chinese Communist Party.

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Appendix A. Political history South Korea (1961-1997).

South Korea's main leader throughout its period of rapid industrialization, general Park Chung-Hee, came to power by means of a military coup in 1961 and was voted president in 1963 and 1967. In 1969 his government forced a constitutional amendment through the National Assembly allowing him to get re-elected for a third presidential term in 1971. The constitutional change and election lead to widespread demonstrations and protests which caused the Park government to declare a state of emergency and eventually, in 1972, to implement a martial law which suspended the constitution, dissolved the National Assembly, and prohibited all political parties and other political activities (see drop from 3 to 1 in figure 1). In November 1972 the Yushin constitution came into power which effectively gave general Park full control over parliament and the possibility of permanent presidency. The president would be elected only indirectly by a National Council for Unification that the president himself headed and of which one-third of the members were directly appointed by the president (the rest being appointed by a structurally rigged election mechanism). This electoral committee in turn elected the members of parliament on the recommendation of the president. All judges were appointed by the president directly, and educational guidelines were under direct government surveillance.

Large protests and political turmoil remained throughout the country which lead to emergency decrees in 1974 and 1975, widespread state violence towards political opposition groups, the jailing of hundreds of dissidents, and finally, in 1979, the murder of general Park himself by Kim Jae-Gyu (the head of the Korean Central Intelligence Agency). After several months of political instability and rapid transfers of government power, general Chun Doo-Hwan came to power through a coup d'état in 1979 and was subsequently (indirectly) elected as president in 1980. Chun established a new constitution with some notable changes; maintaining the presidential system but limiting it to a single 7-year term, strengthening the authority of the National Assembly, and conferring the responsibilities of appointing the judiciary to the Chief Justice of the Supreme Court, rather than the president (see increase from 1 to 3 in figure 1). However, Chun's military regime clearly ruled with fundamentally the same constitutional vision and leadership style as Park had done. The system of indirect election of the president stayed and many military persons were appointed to highly ranked government positions.

Chun's regime finally collapsed under popular revolt in 1987. A revised Constitution was approved by means of a referendum on 28 October 1987 and the first direct presidential election in 16 years took place on 16 December of that year. This election led to Roh Tae-Woo becoming president, who subsequently set out to eliminate past vestiges of authoritarian rule by revising laws and decrees to fit democratic provisions. The move to democracy was further confirmed by the legislative election of 26 April 1988. Freedom of the press was expanded (although still limited) and university autonomy was recognized (see increase from 3 to 6 in figure 1). In December 1996, in a response to popular demand, former president Chun was indicted on charges linked to bribery, illegal funds, and responsibility for the 1980 Gwangju massacre, and was sentenced to prison. In 1997, the opposition leader Kim Dae-jung won the presidential elections; the first time an opposition candidate won the South Korean presidential elections and the first time government power was transferred by peaceful means (35 years *after* South Korea's rapid economic development started in 1963).

Appendix B. Descriptive statistics.

Table 8: Summary statistics.

Variable	Mean	Std. Dev.	Min.	Max	N
Log GDP per capita PPP	9.135	1.207	6.350	11.801	180
Property rights	4.29	2.412	0.5	9.5	176
Constraints on executive (1-7)	5.201	1.938	1	7	159
Constraints on executive = 1-2	0.132	0.34	0	1	159
Constraints on executive = 3-4	0.176	0.382	0	1	159
Constraints on executive = 5-6	0.302	0.461	0	1	159
Constraints on executive = 7	0.39	0.489	0	1	159
Log European settler mortality	4.596	1.303	0.936	7.986	87
Equality of opportunity	5.152	1.947	1	9	125
Low income	0.156	0.364	0	1	186
Middle income	0.559	0.498	0	1	186
High income	0.285	0.453	0	1	186
Log real GDP per capita	8.925	1.212	5.901	11.72	164
Constraints on government	5.7	1.685	2.371	9.275	96
Democracy	6.8	3.045	0	10	192
Government expropriation	5.827	1.591	1.7	9.4	97
Property rights (BTI)	6.24	2.09	1.5	10	125
Contract viability/expropriation	5.4	1.335	2	8	140

Notes: All (interval/ratio) variables are standardized using Z-scores in the models.

Appendix C. Results Penn World Table GDP data.

Table 9: Real GDP per capita (Penn World Tables) regressed on private property rights security.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Property rights	0.848*** (0.065)	-0.088 (0.413)	0.149 (0.110)	0.276** (0.087)
Constant	9.003*** (0.068)	6.988*** (0.301)	8.788*** (0.083)	9.962*** (0.125)
Observations	158	25	85	48
Adjusted R-squared	0.462	-0.038	0.004	0.141

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is real GDP per capita in 2011, measured in constant 2005 US dollars (from the Penn World Tables). Property rights is private property rights security as measured by the Heritage Foundation Index of Economic Freedom. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Table 10: Real GDP per capita (Penn World Tables) regressed on constraints on the executive.

Sample:	(1) Full	(2) Full	(3) Low income	(4) Middle income	(5) High income
Constraints on executive (1-7)	0.383** (0.131)				
Constraints on executive = 3-4		-0.730* (0.322)	-0.459** (0.148)	-0.140 (0.245)	0.352 (0.349)
Constraints on executive = 5-6		-0.909** (0.306)	-0.754*** (0.141)	-0.260 (0.264)	-0.333 (0.332)
Constraints on executive = 7		0.598* (0.271)	-0.518*** (0.006)	-0.009 (0.243)	-0.443 (0.340)
Constant	8.658*** (0.134)	9.031*** (0.243)	7.631*** (0.006)	8.790*** (0.202)	10.636*** (0.332)
Observations	148	148	25	79	44
Adjusted R-squared	0.056	0.274	0.106	-0.015	0.126

Notes: All regressions are OLS. Robust standard errors are reported in parentheses. The dependent variable in all regressions is real GDP per capita (PPP basis) in 2011, measured in constant 2005 US dollars (from the Penn World Tables). Constraints on the executive as measured by Polity IV. Constraints on the executive (1-7) is standardized. Reference category in column (2) (5) are categories 1 and 2 of the original constraints on the executive variable. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Appendix D. Results alternative measures of private property rights security.

Table 11: Income levels regressed on government expropriation without adequate compensation.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Government expropriation	0.659*** (0.084)	0.121 (0.121)	0.225 (0.116)	0.142 (0.114)
Constant	9.391*** (0.090)	7.397*** (0.119)	9.205*** (0.088)	10.348*** (0.130)
Observations	95	11	54	30
Adjusted R-squared	0.329	-0.013	0.052	0.031

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Banks World Development Indicators). Government expropriation without adequate compensation comes from the World Justice Project. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Table 12: Income levels regressed on private property rights security (Bertelmann Transformation Index).

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Property Rights	0.665*** (0.100)	0.258 (0.174)	0.165 (0.095)	-0.525*** (0.110)
Constant	8.891*** (0.090)	7.379*** (0.119)	9.063*** (0.071)	11.097*** (0.189)
Observations	118	24	75	19
Adjusted R-squared	0.299	0.082	0.034	0.275

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Banks World Development Indicators). Property rights is private property rights security as measured by the Bertelmann Transformation Index. Income group classifications are based on the 2017 World Bank income group categorization.
*** p<0.001, ** p<0.01, * p<0.05

Table 13: Income levels regressed on contract viability and risk of expropriation.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Contract viability/expropriation	0.801*** (0.099)	0.080 (0.180)	0.095 (0.100)	0.217*** (0.057)
Constant	9.642*** (0.077)	7.280*** (0.215)	9.199*** (0.090)	10.471*** (0.055)
Observations	131	19	64	48
Adjusted R-squared	0.321	-0.045	-0.004	0.156

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Banks World Development Indicators). Contract viability/expropriation as measured by the International Country Risk Guide (Political Risk Services). Income group classifications are based on the 2017 World Bank income group categorization.
*** p<0.001, ** p<0.01, * p<0.05

Appendix E. Coding of Polity IV's constraints on the executive variable.

(1) Unlimited Authority: There are no regular limitations on the executive's actions (as distinct from irregular limitations such as the threat or actuality of coups and assassinations). Examples of evidence:

- Constitutional restrictions on executive action are ignored.
- Constitution is frequently revised or suspended at the executive's initiative.
- There is no legislative assembly, or there is one but it is called and dismissed at the executive's pleasure.
- The executive appoints a majority of members of any accountability group and can remove them at will.
- The legislature cannot initiate legislation or veto or suspend acts of the executive.
- Rule by decree is repeatedly used.

(2) Intermediate Category

(3) Slight to Moderate Limitation on Executive Authority: There are some real but limited restraints on the executive. Evidence:

- The legislature initiates some categories of legislation.
- The legislature blocks implementation of executive acts and decrees.
- Attempts by the executive to change some constitutional restrictions, such as prohibitions on succeeding himself, or extending his term, fail and are not adopted.
- The ruling party initiates some legislation or takes some administrative action independently of the executive.
- The legislature or party approves some categories of appointments nominated by the executive.
- There is an independent judiciary.
- Situations in which there exists a civilian executive, but in which policy decisions, for all practical purposes, reflect the demands of the military.

(4) Intermediate Category

(5) Substantial Limitations on Executive Authority: The executive has more effective authority than any accountability group but is subject to substantial constraints by them. Examples:

- A legislature or party council often modifies or defeats executive proposals for action.
- A council or legislature sometimes refuses funds to the executive.
- The accountability group makes important appointments to administrative posts.
- The legislature refuses the executive permission to leave the country.

(6) Intermediate Category

(7) Executive Parity or Subordination: Accountability groups have effective authority equal to or greater than the executive in most areas of activity. Examples of evidence:

- A legislature, ruling party, or council of nobles initiates much or most important legislation.
- The executive (president, premier, king, cabinet, council) is chosen by the accountability group and is dependent on its continued support to remain in office (as in most parliamentary systems).
- In multi-party democracies, there is chronic “cabinet instability.”

Source: Marshall, M.G., T.R. Gurr and K. Jagers. 2016. Dataset users manual: Political regime characteristics and transitions. Centre for Systematic Peace (pp. 24-25).

Appendix F. Effect of alternative measures of institutions constraining despotic state power.

Table 14: Income levels regressed on constraints on government.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Constraints on government	0.686*** (0.077)	0.074 (0.160)	0.164 (0.140)	0.228 (0.131)
Constant	9.316*** (0.086)	7.373*** (0.197)	9.169*** (0.090)	10.199*** (0.193)
Observations	95	11	54	30
Adjusted R-squared	0.408	-0.096	0.014	0.117

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Banks World Development Indicators). Constraints on government as measured by the World Justice Project. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Table 15: Security of private property rights regressed on constraints on government.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Constraints on government	0.918*** (0.040)	0.279 (0.260)	0.594*** (0.080)	0.916*** (0.123)
Constant	-0.056 (0.048)	-0.601* (0.233)	-0.305*** (0.074)	0.143 (0.188)
Observations	96	11	55	30
Adjusted R-squared	0.801	0.042	0.496	0.640

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is private property rights security as measured by the Heritage Foundation Index of Economic Freedom. Constraints on government as measured by the World Justice Project. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Table 16: Income levels regressed on (liberal) democracy.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Democracy	0.384** (0.116)	0.036 (0.139)	-0.079 (0.087)	-0.252*** (0.069)
Constant	9.014*** (0.106)	7.224*** (0.079)	8.990*** (0.073)	10.685*** (0.081)
Observations	180	28	100	52
Adjusted R-squared	0.071	-0.035	-0.002	0.229

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is log GDP per capita (PPP basis) in 2013, measured in constant 2011 international dollars (from the World Banks World Development Indicators). Liberal democracy as measured by Polity IV/Freedom House. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05

Table 17: Security of private property rights regressed on (liberal) democracy.

Sample:	(1) Full	(2) Low income	(3) Middle income	(4) High income
Democracy	0.694*** (0.073)	0.298* (0.113)	0.415*** (0.067)	0.378*** (0.081)
Constant	-0.401*** (0.062)	-0.859*** (0.073)	-0.690*** (0.054)	0.715*** (0.107)
Observations	176	27	99	50
Adjusted R-squared	0.363	0.196	0.269	0.189

Notes: All regressions are OLS. Coefficients reported are standardized. Robust standard errors are reported in parentheses. The dependent variable in all regressions is private property rights security as measured by the Heritage Foundation Index of Economic Freedom. Liberal democracy as measured by Polity IV/Freedom House. Income group classifications are based on the 2017 World Bank income group categorization.

*** p<0.001, ** p<0.01, * p<0.05