Borders Change, Institutions Remain

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Abstract

This paper examines how the institutional history of local areas affects the modern concentration of economic activity. The Polity IV dataset provides information about the degree of political participation, openness and competition of executive recruitment, and executive constraint for a number of countries as far back as 1800. Combining this information with historic border changes over the past two hundred years, I have determined the institutional experience of local areas around the globe. Using night light intensity as a proxy for economic activity, I show that a longer experience of more open political institutions is correlated with greater economic development. This relationship is robust to controlling for a broad set of geographic determinants of economic activity. Additionally, to address any reverse causality of more economic development leading to a longer history of more open institutions, I instrument for a local area's institutional experience with the initial and minimum value observed over the past two hundred years. The effect of a longer history of more open institutions remains robust to the instrumental variables approach.

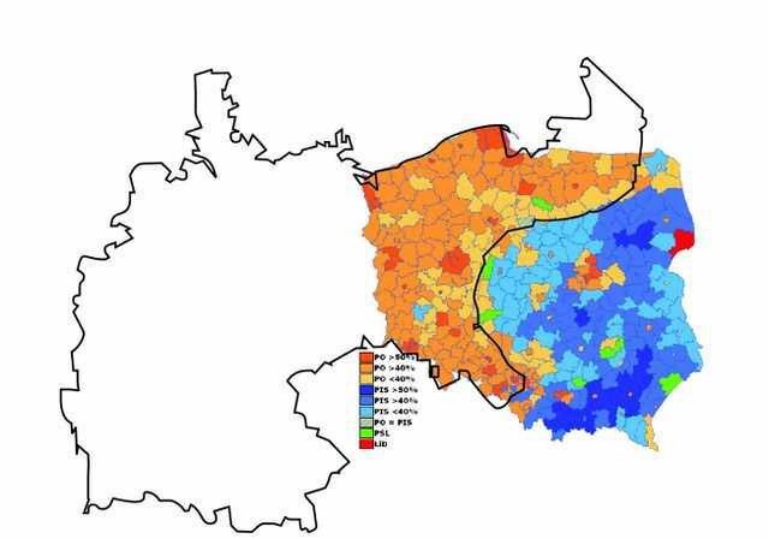
Keywords: Borders, Economic Geography, Institutional Persistence

JEL codes: R12, N40, P48

1 Introduction

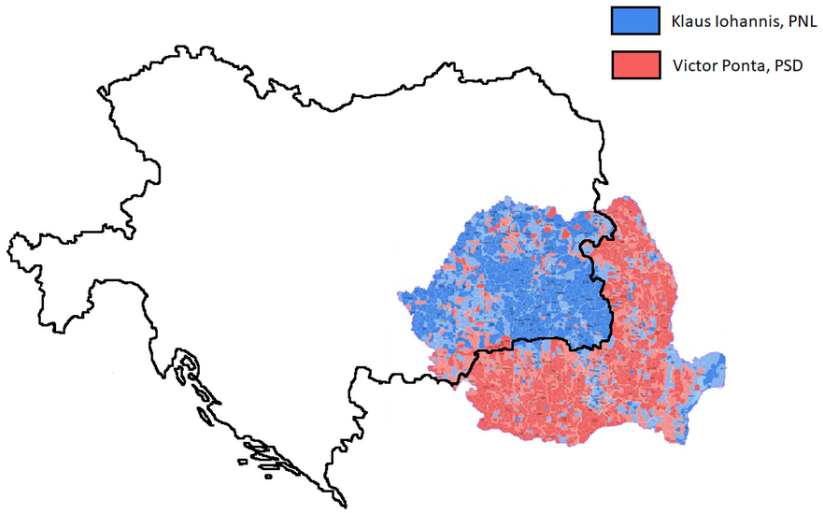
Nearly one hundred years after the end of World War I, we can see persistent effects in the way individuals behave in countries that were part of the former German and Austria-Hungary empires. As can be seen in Figure 1, the areas of Poland that were formerly part of the German Empire strongly preferred the Civic Party in the 2007 legislative elections while the areas that were never part of German Empire strongly preferred the Law and Justice party. A similar effect can be seen in the 2014 Romanian presidential election. The areas of modern Romania that were part of Austria-Hungary strongly preferred Klaus Iohannis to Victor Ponta, while the opposite held in the areas not formerly part of Austria-Hungary. This provides evidence that historical borders have shaped modern voting behaviors. Border changes over time could shape the persistence of national institutions and economic performance.

Figure 1: 2007 Polish Legislative Election



This paper examines how the persistence of institutions at a local level affects the modern concentration of economic activity. Border changes over the last two hundred years have provided nearby areas with different institutional histories. I find that both initial conditions and shocks to the institutional environment are persistent at a local level even when controlling for the effects of modern borders. Using the within-country variation, I find that areas with a longer history of more open institutions have higher night light intensity today. The results seem to be driven by competition for executive recruitment and a higher degree of executive constraint.

Figure 2: 2014 Romanian Presidential Election



To construct a an institutional history at a local level, I use eight global maps at crucial dates in history. Each grid-cell of one degree of latitude and longitude is assigned the institutional value for the country to which it belongs at that time. This provides within country variation of institutional histories given modern boundaries.

Night light intensity is used a proxy for local economic development first popularized by **?**. In a follow up paper, **?** show that geographic variables explain around 45% of the variation in modern night light intensity at a granular level, leaving a lot of variation to be explained by modern country effects. I show that each area's local institutional history has a significant effect on night light intensity even controlling for geography and modern country effects.

2 History and Modern Economic Development

A growing body of literature explores the deep roots of modern economic development, see **?** for a detailed exposition. **?** forcefully argues that the modern advantage of Europe and Asia began with the domestication of animals and plants at the Fertile Crescent. The east-west orientation of the Eurasian continent allowed the agricultural revolution to spread all the way to Western Europe and China. The lack of animals and plants to domesticate in Africa and the Americas and their north-south axis slowed the spread of agriculture. Early agricultural adoption tends to coincide with a long state history leading to higher income levels today (**?**, **?**).

Multiple scholars have argued how colonialism has affected the development path of former colonies through institutions (Acemoglu et al (2001, 2002)), education (**?**), or likely both (**?**). The local environment of colonies determined colonization strategy either settling in favorable climates or subjugating the local population in hostile climates. Where Europeans settled, they brought higher levels of human capital and implemented more open political institutions which persisted to today. In areas where Europeans did not settle, they set up extractive regimes using either cheap or forced labor and found no need to educate the populace.

These cross-country studies obscure within country variation in both institutions and human capital investments. Christian missionaries to both Africa and South America during colonialism have had persistent effects on human capital in villages where they settled. In Sub-Saharan Africa, **?** find higher newspaper readership in areas where Protestant missionaries imported printing presses leading to more political participation and efficiency of public spending today. Similarly, **?** finds areas where Jesuits set up missions in Argentina, Brazil, and Uruguay have higher rates of literacy and more night light intensity. Aditionally, forced labor practices in colonial Peru and the Congo have had effects persist to today. **?** finds that areas subject the mining *mita* of forced labor in the silver mines during colonial times have lower consumption levels today and more evidence of stunting in children. **?** find that areas subject to labor exploitation for rubber during King Leopold's reign in the Belgian Congo have lower education levels and less wealth. This is the first paper to look at how the history of national institutions has affected economic activity at a local level.

3 Institutions and Borders

Over the past two hundred years, some nations have disappeared from the face of the earth, while others have risen to take their place or split from existing countries, and many borders today look different from historic borders. This provides an opportunity to examine institutional persistence in areas that have fallen under the domain of different regimes over time. Using historic maps at crucial dates, I calculate the institutional history of each grid-cell of Earth's landmass (one degree latitude by longitude, approximately 4785 sq. miles or 12492 sq. km at the equator). There is strong evidence of institutional persistence from both initial conditions and shocks to the institutional environment. I find evidence that area's with a longer history of more open political institutions have higher levels of night light intensity today.

Table 1: Polity IV Variable Descriptions

Institutional Variable	higher value indicates...
*polity*2	... more open political system, more democratic and less autocratic.
democ	... more democratic political system.
autoc	... more autocratic political system.
xrreg	... a more regulated process for executive succession.
xrcomp	... a more competitive process for selection of executive.
xropen	... a more open field for executive candidates.
xconst	... a higher degree of executive constraint.
parreg	... more open participation of political interests.
parcomp	... more competition among political interests.

My primary data sources are the Polity IV data set and the night light intensity data along with geographic variables from Henderson et al. I combine these two data sets by using a series of maps at crucial dates in history to assign each grid-cell a normalized value of 0 (more closed political system) to 1 (more open political system) for each year between 1800 and 2010. By summing these normalized values, I create a variable $History_{Lat,Lon}$ and determine its relationship with modern economic activity measured by night light intensity.

The Polity IV data set is one of the most commonly used in the literature when estimating the effects of autocracy and democracy in economics. It also provides the longest time series for these institutional variables with many countries measured as far back as 1800. The namesake variable of this data set is *polity*2 which is defined as the *democ* score less the *autoc* score. Both of the *autoc* and *democ* scores are based on sub-components of competition in executive recruitment (*xrcomp* and *xropen*), constraint on executive power (*xconst*), political participation and regulation (*parcomp* and *parreg*). An additional variable defining the institutional environment is the regulation of executive succession *xrreg*. For each of these variables, I normalize their score between 0 and 1 for each year observed in the Polity IV and each grid-cell of latitude and longitude. Table 1 describes the institutional variables as they range from 0 to 1.

Table 2 below lists the dates for the historical maps used in this research project. The first map is dated 1783 and follows the conclusion of the American Revolutionary War. The next major war to shape international borders is the end of the Napoleonic Wars in 1815. Following Napoleon's defeat, imperialism ascends to a fever pitch in Europe until the Berlin Conference divided the African continent between European powers in 1880. Two World

Table 2: Historical Dates of Maps

Year	Historical Event	Major Border Changes
1783	Treaty of Paris	United States separate from Great Britain
1815	Congress of Vienna	French Empire dissolves into many countries
1880	Berlin Conference	European powers divide African continent
1914	World War I Begins	Ottoman Empire loses Balkans territories
1919	World War I Ends	Austria-Hungary and German Empires dissolve into many countries
1939	World War II Begins	Germany annexes Austria and Sudetenland and Japan invades China
1945	World War II Ends	German and Japanese Empires dissolve into many countries
1992	Cold War Ends	USSR and Yugoslavia dissolve into many countries

Wars shape the next maps 1914 to 1919 and 1939 to 1945. The final major event is the dissolution of the Soviet Union and other communist nations by 1992. Although, I do not at this time have detailed maps for every year for which the Polity IV data set covers, this should provide a first approximation of a local area's institutional history.

The nightlight intensity data set has gained popularity as a way to measure economic activity at a more granular level than nations, regions, or states. Henderson et al. used it to show that much of the variation in modern economic activity is driven by favorable geography. I build off of their data set with the historical maps to determine a local areas institutional experience over the last two hundred years. I define an area's institutional history by the sum of the normalized Polity variables:

$$History_{Lat,Lon} = \sum_{t=1800}^{2010} institution_{Lat,Lon,t}$$

There is a vast difference in institutional experience across the sixteen and a half thousand grid-cells covering landmass. The average number of years achieving the highest Polity score is around 78. On average, the grid-cells have experienced more autocracy (110 years) than democracy (65 years). The most institutional experience that a grid-cell receives on average is a well regulated process for executive succession at 143 years. Highly rated political participation occurs in nearly 117 years on average, while more openness in executive recruitment (99 years), more competition in politics (98 years), and high executive constraint (80 years) occur in less than half of the years in the Polity data set at a grid-cell level. There

are grid-cells with the longest possible history of complete autocracy, while no grid-cells have experienced an unblemished history of the highest score for Polity score or democracy. This is due to political repression as many cells have the longest possible experience of high executive constraint and more open executive recruitment.

3.1 Institutional Persistence

I first examine the persistence of institutions at a local area. I find strong evidence of institutional persistence from both initial conditions and shocks to the institutional environment. The normalized institution value in 1800 is strongly correlated with an area's institutional history. Additionally, the minimum normalized value (maximum for *autoc*) of an institutional variable observed over each grid-cell's history is strongly correlated with an area's institutional history. I first estimate the following equation:

$$ln(History_{Lat,Lon}) = \beta \times Institution_{Lat,Lon,1800} + G'_{Lat,Lon}\gamma + D'_{Lat,Lon}\delta + \epsilon$$

where

- $Institution_{Lat,Lon,1800}$ is the initial institutional value in 1800
- $G_{Lat,Lon}$ is a vector of geographic variables including indicators for biome type, distance to bodies of water, absolute latitude, ruggedness, and malaria environment
- $D_{Lat,Lon}$ is a set of country indicators

Table 3 provides evidence of how persistent institutions are by regressing a local area's institution history against its value in 1800. Column one shows that a local area rated with the highest *polity*2 score in 1800 is estimated to experience 66.5% more years at the highest *polity*2 score. This value in 1800 along with a grid-cells's geography and country effect explains 83.4% of the variation in an area's institutional experience. The persistence experienced in the sub-components of *polity*2 are estimated to be even stronger in magnitude. Column 2 estimates that a local area with the highest *democ* in 1800 experiences 92.4% more years under with the highest democracy score. 80.6% of the variation in total democratic experience is explained by *democ* in 1800 and the geographic variables and country effect. A local area with the highest *autoc* is estimated to experience 130.2% more years under the highest degree of autocracy in column 3. 86.5% of the variation in years with the highest *autoc* is explained by initial level of autocracy along with the grid-cell's geography and country.

The degree of institutional persistence for these broad measures of open and closed political institutions is even greater than the further sub-components of *autoc* and *democ* suggesting complementary effects from executive recruitment, constraint, and political participation in keeping political systems more open or closed.

The greatest degree of persistence from 1800 at a local level in a sub-component is *xconst* in column 7. The highest level of *xconst* in 1800 is estimated to increase the number of years under high executive constraint by 67%. The other sub-components related to executive recruitment are estimated to be much less persistent in columns 5 and 6. The highest level of *xrcomp* in 1800 is estimated to increase the number of years with high executive competition by 18.3%, while the highest level of *xropen* in 1800 is estimated to increase the number of years with more open executive recruitment by 16.6%. A regulated process for executive succession in 1800 (*xrreg*) is estimated to increase the number of years with regulated executive succession by 34.8%. For all sub-components related to the executive, the initial value in 1800 along with an area's geography and country effects explains around 80% of the variation in the institutional history of a grid-cell.

There is a considerable degree of persistence in political participation and competition. The highest value for *parreg* in 1800 is estimated to increase a local area's history with high political participation by 47.3% in column 8. The highest value for *parcomp* in 1800 is estimated to increase a local area's experience with high political competition by 55.2% in column 9. Similar to the other institutional variables, 80% of the variation in institutional history is explained by initial conditions along with geography and country effects. None of the sub-components display the degree of persistence in the broader measures of autocracy and democracy, suggesting that the sub-component institutions complement each other in keeping a political system more open or closed.

After examining the degree of institutional persistence since 1800, I examine whether an institutional "shock" persists over time. The "shock" is measured as the lowest value for each institutional component observed over the history of a local area. The results are broadly consistent with the degree of persistence from initial conditions. Table 4 reports the results from estimating the following equation:

$$ln(History_{Lat,Lon}) = \beta \times min(Institution_{Lat,Lon}) + G'_{Lat,Lon}\gamma + D'_{Lat,Lon}\delta + \epsilon$$

- $min(Institution_{Lat,Lon})$ is the lowest normalized value for institutions over the past 210 years (highest *autoc*)

Table 3: Persistence: Initial Institutions and Institutional History

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$polity2_1800$	0.665***								
	(0.041)								
$democ_1800$		0.924***							
		(0.061)							
$autoc_1800$			1.302***						
			(0.052)						
$xrreg_1800$				0.348***					
				(0.015)					
$xrcomp_1800$					0.183***				
					(0.016)				
$xropen_1800$						0.166***			
						(0.021)			
$xconst_1800$							0.670***		
							(0.035)		
$parreg_1800$								0.473***	
								(0.024)	
$parcomp_1800$									0.552***
									(0.030)
Observations	15355	15355	15355	15355	15355	15355	15355	15355	15355
R^2	0.834	0.806	0.865	0.824	0.846	0.797	0.825	0.827	0.836

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

- $G_{Lat,Lon}$ is a vector of geographic variables including indicators for biome type, distance to bodies of water, absolute latitude, ruggedness, and malaria environment
- $D_{Lat,Lon}$ is a set of country indicators

The results confirm the persistence of institutions. In column 1 of Table 4, a grid-cell that ever experiences the lowest *polity*2 is estimated to experience 49.1% fewer years under the most open political institutions. Column 2 finds the persistence of shocks to *democ* to be even higher at 66.1% fewer years with the most democratic political system for a grid-cell that ever experiences the lowest *democ*. In column 3, I find that autocratic shocks are especially persistent as a grid-cell that experiences the highest *autoc* will have an estimated 324.8% more years under the severest autocracy. Again, over 80% of the variation in these broad institutional histories are explained by persistence, now from shocks, along with geography and country effects.

Persistence from shocks to the institutional sub-components related to the executive are broadly consistent with the degree of persistence from initial conditions. Again, the highest degree of persistence is for executive constraint in column 7. A shock to the lowest degree of executive constraint is estimated to reduce the number of years with high executive constraint by 43.8%. Shocks to the level of *xrcomp* (column 5) are estimated to be more persistent than the degree of *xrcomp* in 1800, where an area that experiences the lowest level of *xrcomp* is estimated to reduce the number of years with high executive competition by 35%. Shocks relating to the regulation of executive succession are estimated to be less than persistent than initial conditions where an experience of the lowest level of *xrreg* (column 4) is estimated to reduce the number of years of with well-regulated executive succession by 13.5%. In column 6, shocks to *xropen* are estimated to be similar to initial conditions as the lowest level of *xropen* is estimated to reduce the number of years with more open executive recruitment by 20.6%. Shocks to institutions related to executive constraint, recruitment, and succession explain nearly 80% of the variation in institutional history with geography and country effects.

The effect of shocks on the history of political participation and competition are estimated to be smaller than the persistence from initial conditions. I find a shock to the lowest *parreg* is estimated to reduce the number of years with high political participation by 22.3%. Column 9 shows that an experience with the lowest *parcomp* is estimated to reduce number of years with high political competition by 34.8%. Similar to above, shocks to the institutions of political participation and competition explain around 80% of the variation in institutional history.

Table 4: Persistence: Institutional Shocks and Institutional History

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
min(*polity2*)	0.491***								
	(0.043)								
min(*democ*)		0.662***							
		(0.056)							
max(*autoc*)			3.248***						
			(0.074)						
min(*xrreg*)				0.135***					
				(0.019)					
min(*xrcomp*)					0.350***				
					(0.020)				
min(*xropen*)						0.206***			
						(0.021)			
min(*xconst*)							0.438***		
							(0.033)		
min(*parreg*)								0.223***	
								(0.025)	
min(*parcomp*)									0.348***
									(0.050)
Observations	16448	16448	16448	16448	16448	16448	16448	16448	16448
R^2	0.830	0.807	0.898	0.786	0.814	0.776	0.817	0.798	0.812

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

3.2 Institutional History and Modern Economic Activity

Table 5 provides evidence of a correlation between more open political institutions and higher night light intensity at a granular level worldwide. The coefficient on all institutional variables are found to be statistically significant at a 1% level even accounting for geographic determinants of economic concentration. The magnitude of the effect varies across institutional dimensions, but the results suggest that areas with a history of more open political institutions have higher concentrations of economic activity. The estimated regression equation takes the form:

$$ln(Light_{Lat,Lon,2010}) = \beta \times ln(History_{Lat,Lon}) + G'_{Lat,Lon}\gamma + D'_{Lat,Lon}\delta + \epsilon$$

where

- $min(Institution_{Lat,Lon})$ is the lowest normalized value for institutions over the past 210 years
- $G_{Lat,Lon}$ is a vector of geographic variables including indicators for biome type, distance to bodies of water, absolute latitude, ruggedness, and malaria environment
- $D_{Lat,Lon}$ is a set of country indicators

In column 1 of Table 5, a 1% increase in the number of years with the highest *polity*2 score increases night light activity by 0.092%. The history of *democ* in column 2 is also estimated to increase economic activity although the magnitude of the effect is around half at a 1% increase in *democ* years increasing night light activity by 0.049%. In the opposite direction, column 3 shows that areas with a longer history of *autoc* have lower concentrations of economic activity. A 1% increase in *autoc* years is estimated to decrease night light intensity by 0.238%. These effects are all found to be highly significant even controlling for the modern institutional and policy environment with country effects.

Broad measures of an area's historical experience with autocracy and democracy are found to affect economic activity, but I find evidence that some institutional features matter more than others in driving these effects. In examining how executive recruitment and succession occurs, the strongest effect comes from more open recruitment of the executive in column 6. A 1% increase in the number of years at the highest *xropen* is estimated to increase night light intensity by 0.230%. While a longer history of competition in executive recruitment is estimated to increase night light intensity intensity in column 5, the effect is not found to be significant at standard levels. The history of a well-regulated process

for executive succession is found to have a negative effect in column 4. A 1% increase in the number of years at the highest *xrreg* is estimated to decrease night light intensity by 0.046%. In column 7, a history of executive constraint is found to significantly increase the concentration of economic activity. A 1% increase in the number of years with the highest *xconst* is found to increase night light intensity by 0.086%.

Lastly, examining the environment for political participation and competition, I find evidence that competition matters more than participation. Column 8 shows a 1% increase in the number of years at the highest score for *parreg* is estimated to increase night light intensity by 0.010%, although not statistically different from zero. The degree of competition in an area's history is found to have a much larger and significant effect on economic activity. A 1% increase in the number of years at the highest *parcomp* is found to increase night light intensity 0.078% in column 9.

The correlation between institutional history and modern economic activity at a local level is evident from Table 5. However, this does not give causal evidence that institutional history is determining night light activity, as a greater concentration of economic activity may lead to more open institutions. To determine the causal effect of institutional experience on modern economic activity, I use the highly persistent nature of institutions (North 1990) found even at a local level from initial conditions and shocks. Using an instrumental variables strategy, I instrument for a local area's institutional history with the value observed in 1800 or the lowest value over the last two hundred years.

Tables 3 and 4 provided evidence that institutions persist from initial conditions as well as shocks to the system. I use initial values and shocks as instruments for the effect of institutional history on modern economic activity at local levels, separately in Tables XX and XX and then together in Table XX. Both initial conditions and shocks should theoretically satisfy the exclusion restriction. While economic development leading to 1800 could affect institutional values, modern night light intensity should only be correlated with institutions in 1800 through the persistence of institutions. Additionally, according to modernization theory (Lipset others), economic development paves the way for democratization and more open political institutions generally. Shocks to a local area's institutions should be unrelated to economic growth as we would expect more economic activity to lead to more open political institutions.

Table 6 presents the results for the effect of institutional history on modern economic activity when instrumenting with the initial value in 1800 while still controlling for geography and country effects. The same pattern emerges that a longer history of more open political

Table 5: Institutional History and Modern Economic Activity: OLS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
History of *polity2*	0.092***								
	(0.028)								
History of *democ*		0.049***							
		(0.018)							
History of *autoc*			-0.238***						
			(0.032)						
History of *xrreg*				-0.046*					
				(0.028)					
History of *xrcomp*					0.059				
					(0.040)				
History of *xropen*						0.230***			
						(0.042)			
History of *xconst*							0.086***		
							(0.021)		
History of *parreg*								0.010	
								(0.025)	
History of *parcomp*									0.078**
									(0.039)
Observations	16496	16496	16496	16496	16496	16496	16496	16496	16496
R^2	0.730	0.730	0.731	0.730	0.730	0.730	0.730	0.730	0.730

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

institutions is associated with greater night light intensity. In column 1 of Table 6, a 1% increase in the years of *polity*2 is estimated to increase night light intensity by nearly 2%. The effect of a longer history of *democ* has a somewhat smaller effect in column 2 where a 1% increase in *democ* years is estimated to increase night light intensity by 1.681%. An institutional history of *autoc* is estimated to significantly reduce economic activity where a 1% increase in *autoc* decreases night light intensity by 0.834%. Again, these institutional histories are estimated to significantly affect modern economic activity even controlling for geography and country effects.

For the variables related to the executive, I find significant effects from longer histories of executive constraint and competition. However, I find no significant effect from a longer history of regulated executive succession. A long history of *xrreg* is estimated to have a positive impact on night light intensity in column 4, although not significantly different from zero. In column 5, a 1% increase in years with high *xrcomp* is estimated to increase night light intensity by 13.80%. I find the effect of a 1% increase of *xropen* to be similar at 13.06%. These estimated effects are quite large compared to OLS likely due to limited variation in initial levels of openness and competitiveness for executive recruitment. Only the United States had the highest level of both *xropen* and *xrcomp*, additionally France had the highest *xropen*. The estimated effect of a 1% increase in years with high *xconst* is estimated to increase night light intensity by 0.607% in column 7.

The final two columns of Table 6 examine how the history political competition and participation affect modern economic development. In column 8, a longer history of political participation is estimated to increase night light intensity, but the effect is not found to be significant. More political participation is found to marginally significant and decrease night light intensity. A 1% increase in years with high *parcomp* is estimated to decrease night light intensity by 0.539%.

Table 7 presents the results for the effect of institutional history on modern economic activity when instrumenting with institutional shocks while controlling for the effect of geography and modern policies. A similar pattern emerges where a longer history of more open political institutions increases modern night light intensity. Additionally, the estimated effects tend to be similar to the previous table, although attenuated from the relatively high estimated effects of longer executive competition and openness.

Column 1 finds the estimated effect of a longer history of *polity*2 is found to be around twice as large in magnitude as the previous table. Here, I estimate that a 1% increase in high *polity*2 years increases night light intensity by 4.207%. Similarly around twice as large

Table 6: Institutional History and Modern Economic Activity - IV Initial Institutions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
History of *polity2*	1.996***								
	(0.271)								
History of *democ*		1.681***							
		(0.217)							
History of *autoc*			-0.834***						
			(0.111)						
History of *xrreg*				0.106					
				(0.136)					
History of *xrcomp*					13.798***				
					(1.458)				
History of *xropen*						13.060***			
						(1.935)			
History of *xconst*							0.607***		
							(0.146)		
History of *parreg*								0.211	
								(0.147)	
History of *parcomp*									-0.539*
									(0.327)
Observations	15355	15355	15355	15355	15355	15355	15355	15355	15355
Anderson LR-stat	381.297	246.847	2873.212	1268.703	138.843	90.114	632.769	960.376	610.648
$p-value$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

in magnitude as the previous estimate, in column 2 I find that a 1% increase in *democ* years increases night light intensity by 3.26%. Lastly, I find a longer history of *autoc* to be attenuated in column 3. A 1% increase in years with a high level of autocracy decreases night light intensity by 0.588%.

The effects of long histories of executive constraint, recruitment, and succession are all found to significantly increase modern economic activity. In column 4, a 1% increase in years with high *xrreg* is estimated to increase night light intensity by 4.012%. The effects of *xrcomp* and *xropen* are found to be around 15% to 35% from the previous table. I find that a 1% increase in years of high competition in executive recruitment increases night light intensity by 2.192% in column 5. A 1% longer history of more open executive recruitment is estimated to increase night light intensity by 4.391%. Column 7 shows that the estimated effect of a 1% increase in years with high *xconst* is a 2.594% increase in night light intensity, which is around six times larger than the previous table.

In the final two columns of Table 7, I find a negative effect from more political participation, while more political competition increases economic activity. I find that a 1% increase in years with high *parreg* is estimated to decrease night light intensity by 1.618% in column 8. The final column shows that 1% increase in years with high *parcomp* is estimated to increase night light intensity by 1.387%.

Table 8 presents the results when using both initial conditions and shocks as instruments for the institutional history of a grid-cell while still controlling for geography and country effects. I continue to find that a longer history of democracy increases night light intensity, while more autocracy decreases night light intensity. Here the effect of more open political institutions seems to be driven by more open executive recruitment (*xrcomp*, *xropen*) and constraint (*xconst*), without any significant effect from political participation and competition (*parreg*, *parcomp*).

The effect of a 1% increase in *polity*2 years is estimated to increase night light intensity by 2.153% in column 1. The magnitude of the effect of *polity*2 is split between about two-thirds coming from the positive effect of more *democ* and the other third from the negative effect of *autoc*. In column 2, I find that a 1% increase in *democ* years increase night light intensity by 1.654%. This is slightly over twice the size of a 1% increase in *autoc* estimated to decrease night light intensity by 0.745%. All effects are still found to be statistically significant and the Anderson LR-statistic suggests that institutional history is not under identified by the instruments.

The institutional history of executive recruitment and constraint is found to significantly

Table 7: Institutional History and Modern Economic Activity - IV Institutional Shocks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
History of *polity2*	4.207***								
	(0.498)								
History of *democ*		3.260***							
		(0.379)							
History of *autoc*			-0.588***						
			(0.050)						
History of *xrreg*				4.012***					
				(0.898)					
History of *xrcomp*					2.192***				
					(0.336)				
History of *xropen*						4.391***			
						(0.656)			
History of *xconst*							2.594***		
							(0.318)		
History of *parreg*								-1.618***	
								(0.512)	
History of *parcomp*									1.387**
									(0.609)
Observations	16448	16448	16448	16448	16448	16448	16448	16448	16448
Anderson LR-stat	168.645	115.847	12629.382	62.258	655.826	201.042	255.041	81.226	159.875
$p-value$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 8: Institutional History and Modern Economic Activity - IV Initial Institutions and Shocks

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
History of *polity2*	2.153***								
	(0.277)								
History of *democ*		1.654***							
		(0.216)							
History of *autoc*			-0.745***						
			(0.059)						
History of *xrreg*				0.057					
				(0.135)					
History of *xrcomp*					1.682***				
					(0.293)				
History of *xropen*						2.292***			
						(0.391)			
History of *xconst*							0.703***		
							(0.149)		
History of *parreg*								0.144	
								(0.147)	
History of *parcomp*									-0.117
									(0.273)
Observations	15355.000	15355.000	15355.000	15355.000	15355.000	15355.000	15355.000	15355.000	15355.000
Anderson LR-stat	383.970	246.930	11905.798	1272.098	1131.252	507.185	635.379	968.737	969.906
$p-value$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Additional covariates include indicators for a local area's biome, terrain ruggedness, elevation, malaria ecology, indicators for on coast, river, harbor, distance to coast, river, harbor, or lake, and continental dummies. Robust standard errors reported in the parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

increase night light intensity, however there is not a significant effect from a longer history of regulated executive succession. In column 4, a longer history of *xrreg* is estimated to increase the modern concentration of economic activity, although the magnitude is relatively small and not significant at standard levels. The largest effect comes from a longer history of *xropen* as a 1% increase in years with more open executive recruitment is estimated to increase night light intensity by 2.292% in column 6. A longer history of *xrcomp* is found to be significant in column 5 with a 1% increase in high competition for executive recruitment estimated to increase night light intensity by 1.682%. The smallest significant effect comes from a longer history of executive constraint where a 1% increase in high *xconst* history is estimated to increase night light intensity by 0.703% in column 7.

The institutional history of the subcomponents related to political participation and competition are not found to have a significant effect on modern economic activity when instrumenting with initial conditions and shocks. In column 8, the effect of an increase in *parreg* history is estimated to increase night light intensity although not significantly different from null. I find that a longer history of *parcomp* is estimated to decrease night light intensity in column 9, although again the effect is not significantly different from zero. This suggests that longer institutional histories of political participation and competition are not driving economic development.

4 Conclusion

This paper finds that there is a large degree of persistence in institutions at a local level. Using the persistence of institutions as a source of variation in institutional history, I find that areas with a longer history of more open institutions have higher concentrations of economic activity as measured by night light intensity. The evidence suggests that this is driven by more open and competitive recruitment and a higher degree of executive constraint rather than broad political participation and competition. Future research can uncover which mechanisms the persistence of these institutions related to the executive shape the concentration of economic activity.

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