"Time in Office" of City Mayors and Economic Convergence, c. 1870-Present

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ABSTRACT

According to various growth theories, technology is the main factor driving long-run growth and economic convergence. Yet this process is constrained by the features of a country's institutional background. In this paper, we investigate the relationship between economic convergence and countries' institutions, in particular by focusing on the duration of mayors' office terms. To this end, we built a novel institutional dataset covering 53 countries with mayors' tenures for the period c. 1870-2010. By using a rolling sample methodology with institutional thresholds based on the length of the mayors' tenures, we find, on the one hand, economic divergence between countries with similarly low levels of "time in office". On the other hand, we find a consistent process of convergence among countries with higher levels of time in office. Additionally, we argue that shorter mayoral tenures can have positive effects on economic convergence dynamics only for countries with good institutional fundamentals overall.

1. Introduction

Since the introduction of the growth theory (e.g. Solow, 1956; Mankiw et al., 1992) and the new growth theory (e.g. Romer, 1986), it has been argued that technology drives long-run growth. This implies that, on the condition that technological knowledge circulates to other countries without limitations, there is structural economic convergence (Clark and Feenstra, 2003). Examples of limits

to the free circulation of technological knowledge have been extensively discussed in the literature. Kremer (1993), for example, claims that technological change is also determined by population size. However, this does not necessarily exclude the free transfer of technology from more populated countries to other less populated areas, as the latter may "free-ride". Some other models of technology dissemination argue that technology spreads mainly to (and is developed in) countries with high levels of physical capital-to-labour ratio, and therefore that technology is mainly capital intensive (Basu and Weil, 1998; Acemoglu, 2002; Allen, 2012). Yet other studies focus on the quality of the institutional background as a major determinant in the process of technology spreading – and consequently on convergence dynamics. For example, government efficiency ensures the most appropriate environment for investment in unknown technologies (see e.g. Comin and Hobijn, 2004; Zhu et al., 2006; Galang, 2012; see also Acemoglu and Robinson, 2013).

There are thus various theories, each with its own factors, which attempt to explain the pace at which technology spreads among countries. In this paper, we build on this theoretical basis by focusing on an analysis of the relationship between institutions and economic growth over a time frame that runs from 1870 to the present. There are two ways to look at institutions: firstly as part of the growth equation alongside labour, human capital and physical capital, and secondly as a general environment. In the latter case, institutions determine the "efficiency" of the convergence dynamics, for example in the case of absolute convergence (richer countries experience slower per capita growth than poorer ones) (e.g. Knack, 1996). We test this by opting for a rolling sample analysis of GDP growth per capita on the natural log (ln) of GDP per capita per reference year (t), where the sample of countries included in the regressions varies by institutional threshold. This methodology allows for the identification of institutional quality thresholds in economic convergence dynamics among countries, once they are ordered based on the level of measured institutions. To this end, we use a novel institutional variable based on the length of mayors' terms of office ("time in office") to determine the

institutional thresholds for our rolling sample empirical model. We therefore start the next section with the creation of an institutional dataset consisting of the length of time in office of mayors for a group of cities in 53 countries. We discuss the novelty and limits of this newly created dataset. In Section 3, we use our institutional data to evaluate long-run economic convergence among countries based on a rolling sample regression analysis. We discuss our results in Section 4 and we end with a brief conclusion in Section 5.

2. A new institutional database

Using institutions to explain technological spread can be considered by definition as an incomplete exercise, since no existing institutional proxy captures all its variance. Indeed, when analysing institutions, a distinction can be already made between economic institutions, civil liberties, and political institutions. Economic institutions refer to, *inter alia*, property rights, entrepreneurship (e.g. Lafuente et al., 2020) and human capital enhancement (Aghion et al., 2005). Civil liberties include, for example, metrifications of categories such as "freedom of expression and belief" or "associational and organizational rights" (see Gastil, 1983; Scully, 1988). Political variables include, for example, monarchy dummies (De Long and Shleifer, 1993) and the Polity4 and Polity5 datasets on autocracy and democracy (Polity5 Project 1800-2018). These variables combine to provide the Polity2 variable, an index of autocracy–democracy ranging from total autocracy (-10) to total democracy (+10). A further political variable is the index of active parliaments (Van Zanden et al., 2012).

While economic indicators are obviously of direct importance for the transfer of technology, political indicators offer more immediate data availability (e.g. Beck et al., 2001; Commander and Nikoloski, 2011). Various studies therefore link political institutions with economic ones to use political actors as a long-run explanatory factor for economic growth. For example, political instability leads to higher costs (because of shorter tenures of officials) and weakened

property rights. This argument is used, for example, for the rise of active parliaments (defined as the number of years per century a parliament is in session). Active parliaments are argued to be related to constraints on the monarchy, which leads to more secure property rights and in turn to lower interest rates (e.g. Hoffman and Norberg, 1994; Van Zanden et al., 2012).

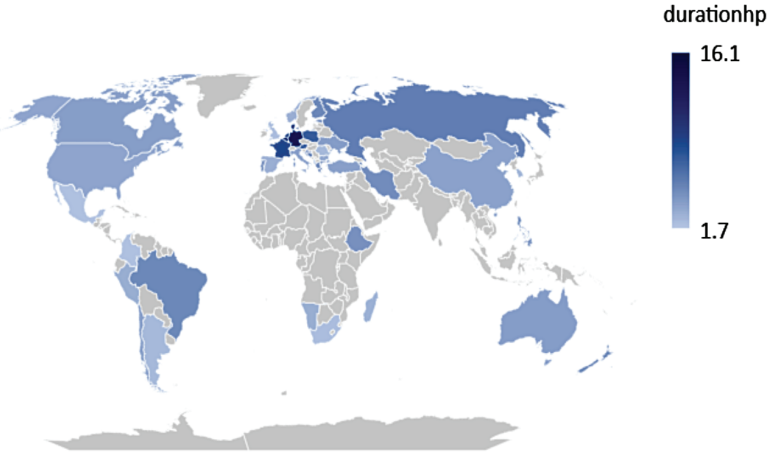
However, linking the stability of political institutions to their potential effect on a country's economic convergence is not without its problems. As pointed out by Knack and Kiefer (1995), a dictatorship environment might be efficient in repressing coups (thereby generating long tenures) but inefficient in securing property rights. To this, we may add that a dictatorship variable is only sensitive to unconstitutional change. It ignores lawful (constitutional) changes, which may also affect economic stability.

Finally, since the absolute maximum levels for measures like Polity2 are -10 or +10 – countries that are either totally democratic (+10) or totally autocratic (-10) –, their values cannot be increased or decreased any further. For example, after 1920 the value for the Netherlands is 10 (total democracy), thus supplying little information on trends in the past century (between 1920 and 2020).

To limit some of these problems, we used a new measure of the quality of the institutional background based on the duration of mayors' time in office in the capital city (or other major cities) for a group of 53 countries. We calculated "time in office" based on the start year and end year, using the following equation: end year – start year +1. The +1 was added to avoid setting the duration in office at zero for those mayors who were in office for less than one year. These series are, of course, prone to outliers when a specific mayor was in office for an exceptionally long period. So, after taking the mean by decade, we smoothed the data using a Hodrick–Prescott filter with a smoothing factor of 100.The results are reported in Figures 1a and 1b.

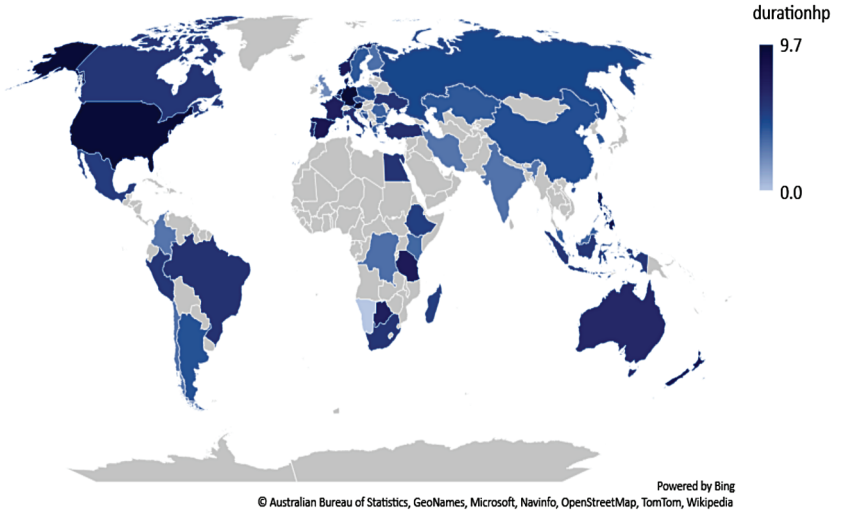
Compared to other institutional indicators, "time in office" has a few advantages. First, we drew the data from lists of mayors available on Wikipedia running back to the 19th century, and therefore

Figure 1a
Mayors' time in office (1900)



Source: duration index: see Appendix A.

Figure 1b
Mayors' time in office (2010)



Source: duration index: see Appendix A.

we cover a longer period compared to the previous literature (see Appendix A).[1] A second advantage is that the "time in office" series provides a value for each unit of the time scale that we consider, thereby avoiding long periods of unchanged institutions.

A third advantage of our indicator is that it allows us to incorporate *de facto* effects versus more formal ones described for example by political institutional variables previously used in the literature, such as Polity2. For example, an institutional indicator of a dictatorship only captures unlawful changes of power, while "time in office" can capture a wider range of effects on the overall institutional background, including continuity under different central political regimes. Indeed, as pointed out for example by Knack and Kiefer (1995), Malawi and Zambia are countries characterised by long-lasting central governments but low levels of secure property rights. So macro governments do not necessarily capture economic institutions the way local governments do. If we take the Democratic Republic of Congo during the 31-year presidency of Mobuto Sese Seko, we find that the average duration of the mayor's terms in office was only 4.4 years. Hence, Mobutu's long term as head of government was not indicative of fast economic development, and the short "time in office" was a potential indicator of bad economic fundamentals. Indeed, a weak correlation exists between "time in office" and an indicator such as Polity2, which not only focuses mainly on macro policy but also is structured so as to increase monotonically with the quality of governance. We report the correlation between the "mayors' time in office" variable and Polity2 in Figure 2.

However, there are some points to deal with. First, we retrieved our data from a group of lists of mayors found on Wikipedia.[2] In order to test the reliability of these lists, we cross-checked a sample of them with the original source where the list was retrieved.[3]

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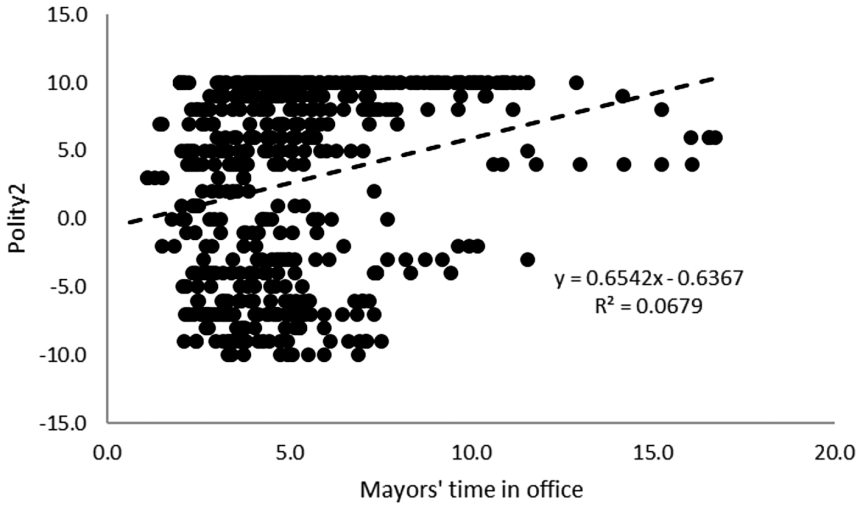
[1] While these series offer a valuable glimpse of a long-run perspective, they do have one limit: namely, the choice of cities is constrained by the availability of long-run information about mayors on Wikipedia.

[2] Https://en.wikipedia.org/wiki/Lists_of_mayors_by_country (consulted on 6 October 2023).

[3] To this end we used the lists of mayors found on the web pages of the city authorities

Figure 2
Correlation between Polity2 index and mayors' time in office



Source: Polity5 Project 1800-2018; duration index: see Appendix A.

Second, since long-run lists of mayors going back to the 19th century were only available for certain cities (not always the capital or the major economic cities), for several countries that have at least two cities with available lists of mayors we checked whether they have a low average difference in the number of years per mayor. We performed this test for several pairs of cities and obtained an average error of 0.8 years per decade mean.[4] Since this result is below the threshold value of 1, which is set as the lower bound for our institutional measure (see above), we therefore consider as justified the choice to take one city for each country under the assumption that the result is applicable by and large to the entire country.

for our sample. See e.g. Rome and Birmingham: https://www.comune.roma.it/web-resources/cms/documents/ELENCO_CONSILIATURE_WEB.pdf; https://www.birminghamal.gov/mayors-of-the-city-of-birmingham (consulted on 6 October 2023).

[4] We compared long-run series of mayors for: UK, the city of Birmingham with London; New Zealand, Wellington with Christchurch; the US, New York with Dallas; China, Beijing with Shanghai; Brazil, Porto Alegre with Rio de Janeiro. The decadal means were then smoothed by using a Hodrick–Prescott filter with a smoothing factor of 100.

Third, and most importantly, can "mayors' time in office", besides being a political variable, function as a proper economic variable? Analyses of municipality-level institutions and their relationship with economic growth have been somewhat neglected in the literature, in particular from a long-run perspective, mainly because of the lack of data for more disaggregated levels (see Balanguer-Coll et al., 2021). Moreover, this type of analysis has produced mixed results in literature. The basic assumption is that the average time in office of a mayor in the main cities of a country can work as an indicator of the efficiency of a *de facto*[5] institutional environment, since it can be used to approximate security of property rights, low interest rates and all kinds of other factors attributable to those "clusters of economic institutions" described by Acemoglu and Robinson (2006) (see also Foldvari, 2017). For example, Pribble (2018) finds that Chilean municipalities with longer mayoral tenures have higher "institutional effectiveness" compared with others where mayors have shorter terms. Zhou and Zeng (2018) find that promotion incentives for mayors in China have a positive effect on GDP growth rate, while Eaton and Kostka (2014) find that environmental policy implementation in China is more efficient when pursued at the local level by officials with longer tenures. Shi et al. (2018) find evidence of a positive relationship between municipal annual GDP per capita and the duration of the tenure of the leading municipal officials in China between 2002 and 2013. Akhtari et al. (2022), in the same way, argue for a negative relationship between political turnover at the local level and quality of public services in Brazil.

Conversely, Coviello and Gagliarducci (2017) find that in Italy

[5] As opposed to formal political power, namely the so-called *de jure* institutions (see e.g. North, 1981, 1990; Hall and Jones, 1999; Hodgson, 2006; Hansson, 2009), a more overarching perspective thus contemplates the co-existence and overlapping of both *de jure* and *de facto* institutions within the same country (see also Foldvari, 2017; Agarwala and Ginsberg, 2017; Mechkova et al., 2019) together with the presence of different gradations and manifestations of the overall institutional framework at the regional (see e.g. Charron et al., 2019) or municipal level (see Lin and Zhang, 2014; Rodriguez-Pose and Zhang, 2019; Hortas-Rico and Rios, 2019; Balaguer-Coll et al., 2022).

the longer tenures of Italian mayors are associated with worse economic outcomes compared to shorter tenures. In the same way, Garcia-Vega and Herce (2011) find a negative relationship between tenure in office and GDP growth for Spanish municipalities between 1980 and 1998. Wolman et al. (1996) empirically demonstrated that between 1974 and 1985 "changing mayors did matter" in US municipalities. Furthermore, they showed that mayoral change had greater policy effects, measured in terms of per capita expenditure by the mayoral administration, in the cities with more facilitative structures, rather than in those without. Finally, Connolly (2018) highlights a positive relationship between city managers' turnover in California during the recession phase from 2008 to 2011 and the expected fiscal outcomes of the municipalities between 2011 and 2012.

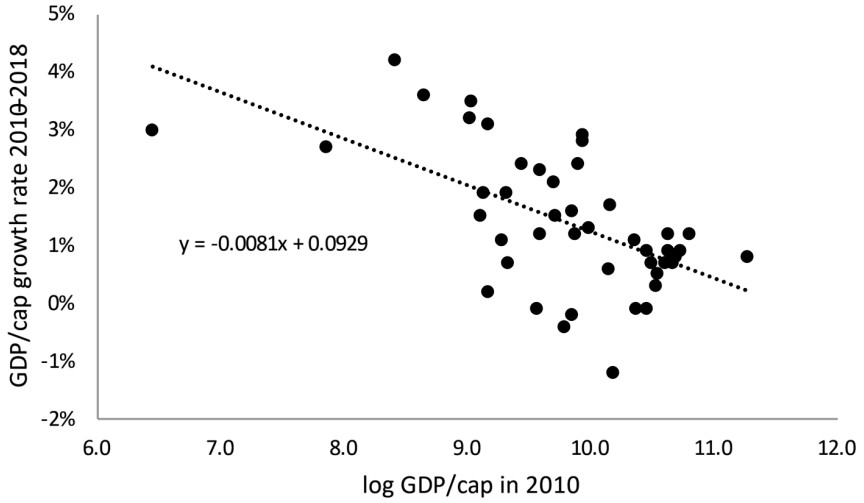
3. Mayors' time in office, institutional thresholds and economic convergence of countries in the long run

We can graphically depict the presence, or absence, of convergence as follows: the further away countries are from the mean per capita income, the faster they grow (Eichengreen et al., 2012; see also Musacchio and Werker, 2016). Essentially, the basic intuition behind this idea is that when countries with higher GDP per capita have lower GDP growth and countries with lower GDP per capita have higher GDP growth at the same time t (so with a resulting negative slope once linearly regressed), there is a global economic convergence among countries. This is shown, for example, in Figure 3 where the x-axis is the log of GDP per capita in 2010 and the y-axis compounds annual growth rates between 2010 and 2018.

The estimates of absolute convergence can be plotted against our new measure of institutions, thereby showing whether absolute convergence differs according to length of time in office. Yet before turning to regressions, we first need to distinguish between different growth patterns, based on the level of institutional quality and rate of growth, as suggested by Rodrik (2013:21) (Figure 4). One pattern,

for example, shows a rapid transition from traditional economic sectors into modern ones (e.g. from agriculture to industry) without changes to the institutional background (cells (1) to (2), Figure 4). Another pattern allows instead for a positive relationship between institutions and economic growth (cells (2) to (4), Figure 4).

Figure 3
GDP/cap growth rate 2010-2018 vs log GDP/cap in 2010



Source: Maddison Project Database, 2020 version.

Figure 4
Four growth outcomes with a given level of institutional quality and rate of economic growth

Level of institutional quality	Rate of growth: Slow	Rate of growth: Rapid
low	(1) no or very little growth	(2) episodic growth
high	(3) slow growth	(4) rapid, sustained growth

Source: Rodrik (2013: 42).

Each cell refers to a certain type of country. Cell (1) consists of countries with low GDP per capita that didn't improve their fundamentals or experience economic transformation when shifting from traditional sectors to modern ones. Cell (3) contains countries with increasing fundamentals that nevertheless experience limited growth (e.g. the Philippines for the benchmark decade 2010s). Cells (2) and (4) are fast-growing countries. Cell (2) shows episodic growth, and like Rodrik we define the countries in this cell as "miracle growth" countries. Cell (4) contains countries characterised by sustained growth and stable accumulation of human capital and institutional capabilities (mostly Western countries, but also, again depending on the year, East Asian economies such as South Korea in the 2010s).

Table 1
Miracle growth countries with at least 4.5% yearly growth over a 30-year period

Episodic Growth				
Country	Start period	End period	Max growth rate in period	Institutional value
Australia	1820	1872	29.1%	6.0
Greece	1941	1985	7.6%	4.6
Italy	1942	1980	34.4%	4.8
Spain	1945	1980	10.9%	6.4
Portugal	1949	1989	11.1%	7.1
South Korea	1939	2016	12.8%	3.6
Botswana	1950	2010	22.7%	4.8
Malaysia	1900	1937	26.9%	
	1963	2005	11.8%	4.7
Indonesia	1966	1997	12.2%	5.0
China	1972	2018	10.6%	4.9
Brazil	1945	1977	11.1%	4.8

Keeping this in mind, we therefore used the following model for the rolling sample regressions, ordered by progressively increasing the levels of our mayoral tenure institutional indicator:

$$GDPcapGrowth = \beta GDPcap + \delta s$$

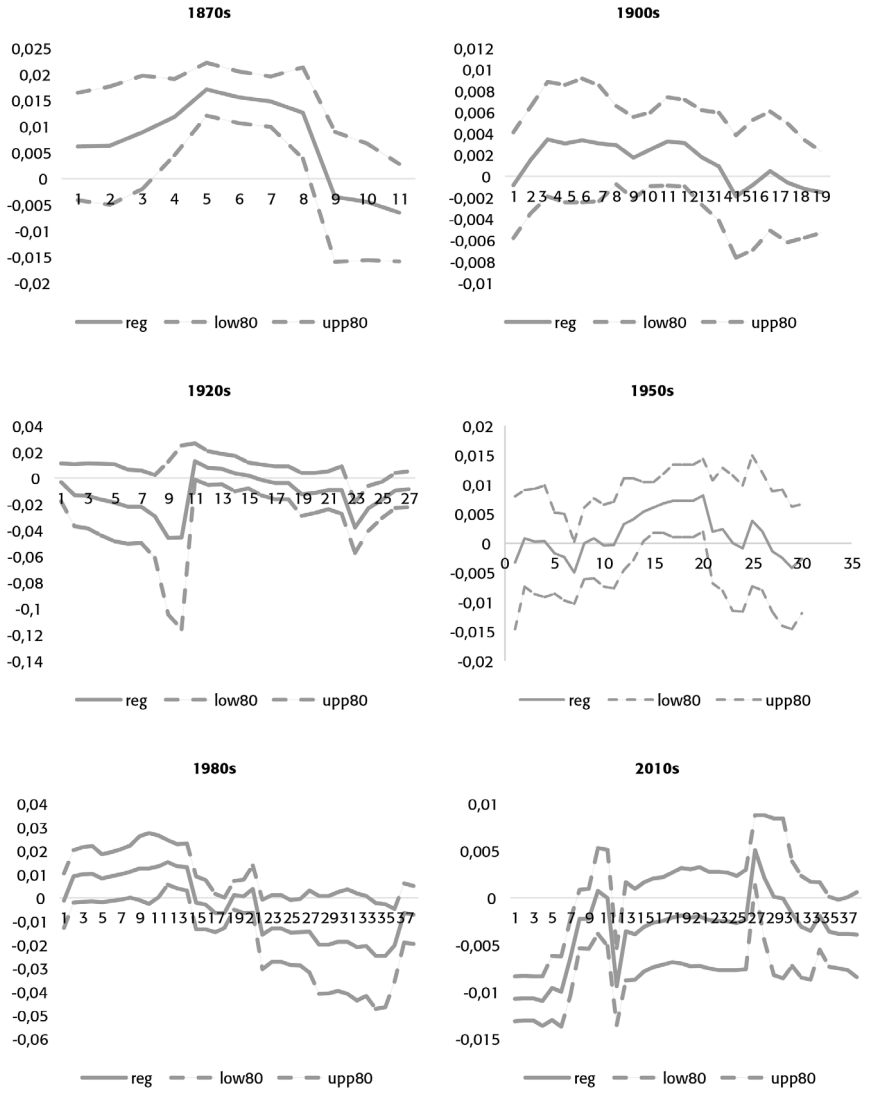
where $\delta 1$, $\delta 2$ and $\delta 3$ are respectively three dummies for countries in Rodrik's cells 1, 2 and 3. $\delta 1$ is a dummy for countries with below-median growth and below-median institutions, where institutions are measured with the Polity2 variable. $\delta 2$ is a dummy for countries with below-median institutions and above-median growth. $\delta 3$ is a dummy for countries with below-median growth and above-median institutions. Polity2 therefore determines the attribution of the dummies, while the "time in office" variable does not directly enter the equation but determines the composition of the rolling groups of countries for the regressions.

The results are depicted in Figure 5, and show, on the left hand of the figures, the countries with the lowest tenure values. With each iteration, the regression moves to the right, so that countries with higher mayoral tenure indicator values are gradually added, while countries with lower levels are removed. At the very right of the spectrum, there are therefore countries with the highest levels of time in office. In this way, we can evaluate the degree of convergence/divergence per group of countries, ordered by the progressively increasing length of their mayors' tenure.

4. Discussion

Figure 5 shows a consistent trend throughout the time frame analysed in this paper towards divergence among the groups of countries with shorter time in office for mayors (so the left part of the graphs in Figure 5) and convergence among the groups of countries with longer time in office for mayors (the right part of the graphs). Divergence in the shorter tenure groups is led by countries with higher GDP per capita, better average institutional background (measured by the Polity2 variable) and faster average long-run trend GDP growth. In these groups, for example, from the 19th century until the first half of the 20th century we consistently find the UK, the US, Norway and South Africa, together with several South American countries (e.g. Colombia) and Eastern European countries

Figure 5
Moving regression with countries grouped per increasing institutional threshold ("time in office")



Note: The six panels in this figure depict the outcomes of our rolling sample regressions for each reference decade (top of the panel). The Y-axis represents the slope of the regressed line for each institutional group, while the X-axis indicates the ordinal number assigned to the institutional groups (with higher numbers corresponding to higher institutional thresholds). The dotted line is the 80% confidence interval.

(e.g. Romania). In the second half of the 20th century, in the short-tenure groups we find countries such as Finland and the UK, Congo, Kenya, India, Iran, South Korea, Colombia and Chile.

Convergence (when significant) in the right-side groups (with longer mayoral tenures) is instead led throughout the overall time frame by the GDP growth of countries with lower GDP per capita but varying levels of institutional quality – ranging for example from the -10 of the Polity2 variable for Moscow and Tehran in 1900 to the high values for the Philippines in most of the reference years of our sample.

One can say indeed that only those countries that steadily enhanced their institutional and economic fundamentals eventually converged. As pointed out by Rodrik (2013), countries that experienced growth without fundamentals (defined as "episodic" or "miracle growth" in cell (2) in Figure 5) can also experience convergence during certain periods. However, as soon as the shift of production to modern sectors has ended, this growth peters out. Indeed, many growth miracles that occurred in the second half of the 20th century did not improve institutions (or lead to investment in fundamentals like human capital) during the period of fast growth. Low-institution countries can converge in these moments of boosted growth, but once their economy is no longer dual (i.e. a shift to modern sectors is no longer possible) they exhaust their convergence thrust (see also Barro, 2012). Convergence in the long run takes place only in the context of long-term investment in countries with high-quality institutional backgrounds.

Time in office of mayors is one of the features of the institutional background. The results presented in Figure 5 suggest a positive relationship between longer mayoral terms in countries with lower-than-average GDP per capita and better economic performance, which eventually leads towards economic convergence dynamics with richer countries. At the same time, countries with sustained GDP growth in a context of stronger institutional fundamentals can benefit from shorter mayoral terms. As shown for 1920 and 2010 – which are indeed the two reference decades where the average value

of Polity2 amongst the countries in our sample is the highest, respectively 3.9 and 7.4 –, we also detect economic convergence in the shorter tenure groups. Institutional improvement once again appears to be one of the factors ensuring economic convergence.

In the context of this paper, among the other factors contributing to economic convergence, we can for example mention the globalisation-driven effects. In the 19th century, Europe witnessed wage convergence, making labour-saving technology more productive in all European countries, with land-intensive countries like those in Latin America delivering primary products in exchange for manufactured products from Europe (O'Rourke, 2002). Since European countries were predominantly high-level institutional countries, the resulting convergence mostly occurred at high institutional levels. When globalisation declined as a result of the dynamics of the interwar years, the spillover effects became a determinant for converging growth of total factor productivity among countries in a phase of global income convergence (Milanovic, 2006), as argued for example by van Leeuwen et al. (2023). In addition, as Lucas points out in his constant hazard rates model of the start of access to industrialisation (Lucas, 2000), countries may leave behind their non-industrial past at a random time, partly because of the spread of knowledge and technology produced elsewhere. This leads to convergence for lower GDP per capita countries mainly starting somewhere between 1920 and 1960. In 2010, globalisation was again linked to convergence and, combined with the continuing Lucas effect of countries randomly joining the Industrial Revolution, this became associated with a global improvement in institutional background, including in countries with lower GDP per capita.

5. Conclusions

Technology is a decisive factor for long-run growth, but its implementation is limited by the quality of the institutional background. We use a new detailed dataset of mayors' "time in office" to intro-

duce a further indicator of the features of the institutional background of a country.

The basic hypothesis that we present in this paper is that mayoral terms have different effects on the economic performance based on different characteristics of the institutional settings in the countries where mayors are in office. Shorter mayoral terms can result in negative effects on economic performance in countries with lower GDP per capita and lower levels of overall institutions (measured with the Polity2 variable). Longer terms are associated instead with positive effects for countries with lower GDP per capita at any level of institutional quality.

By performing a rolling sample analysis making use of the "time in office" variable to determine institutional thresholds, we consistently find the above-mentioned pattern for our sample of 53 countries over the period between 1870 and 2010. Partial exceptions emerge in the 1920s and the 2010s, with both decades showing economic convergence regardless of term length. While global convergence dynamics in the interwar years and the second globalisation wave played a role in this outcome, we also interpret this result as further evidence corroborating the hypothesis that countries with stronger institutional fundamentals can benefit from shorter mayoral terms and increased turnover of leading local officials.

References

Acemoglu D. (2002), "Directed Technical Change", in *Review of Economic Studies*, no. 69, pp. 781-809.

Acemoglu D., Johnson S., Robinson J.A. (2005), "Institutions as a Fundamental Cause of Long-Run Growth", in P. Aghion, S.N. Durlauf (eds.), *Handbook of Economic Growth*, Vol. 1A, Elsevier, Amsterdam, pp. 385-472.

– (2006), "De Facto Political Power and Institutional Persistence", in *American Economic Review*, 96(2), pp. 325-330.

Acemoglu D., Robinson J.A. (2013), *Why Nations Fail: The Origins of Power, Prosperity and Poverty*, Profile Books, London.

Aghion P., Meghir C., Vandenbussche J. (2005), *Growth, Distance to Frontier and Composition of Human Capital*, CEPR Discussion Paper No. 4860, Centre for Economic Policy Research, London.

Agarwala M., Ginsberg J.R. (2017), "Untangling Outcomes of De Jure and De Facto Community-Based Management of Natural Resources", in *Conservation Biology*, no. 31, pp. 1232-1246.

Allen R.C. (2012), "Technology and the Great Divergence: Global Economic Development since 1820", in *Explorations in Economic History*, no. 49, pp. 1-16.

Akhtari M., Moreira D., Trucco L. (2022), "Political Turnover, Bureaucratic Turnover, and the Quality of Public Services", in *American Economic Review*, 112(2), pp. 442-493.

Balaguer-Coll M.T., Narbón-Perpiñá I., Peiró-Palomino J., Tortosa-Ausina E. (2022), "Quality of Government and Economic Growth at the Municipal Level: Evidence from Spain", in *Journal of Regional Science*, no. 62, pp. 96-124.

Barro R.J. (2012), *Convergence and Modernization Revisited*, NBER Working Paper No. 18295, National Bureau of Economic Research, Cambridge, MA.

Basu S., Weil D.N. (1998), "Appropriate Technology and Growth", in *Quarterly Journal of Economics*, no. 113(4), pp. 1025-1054.

Beck T., Clarke G., Groff A., Keefer P., Walsh P. (2001), "New Tools in Comparative Political Economy: The Database of Political Institutions", in *World Bank Economic Review*, no. 15(1), pp. 165-176.

Bolt J., Van Zanden J.L. (2020), *Maddison Project Database, version 2020, Maddison Style Estimates of the Evolution of the World Economy. A New 2020 Update*.

Bosker M., Buringh E., Van Zanden J.L. (2013), "From Baghdad to London: Unraveling Urban Development in Europe and the Arab World, 800-1800", in *Review of Economics and Statistics*, no. 95(4), pp. 1418-1437.

Charron N., Lapuente V., Annoni P. (2019), "Measuring quality of government in EU regions across space and time", in *Papers in Regional Science*, no. 98(5), pp. 1925-1953.

Clark G., Feenstra R.C. (2003), "Technology in the Great Divergence", in M.D. Bordo, A.M. Taylor, A.M. Williamson (eds.), *Globalization in Historical Perspective*, University of Chicago Press, Chicago, pp. 277-321.

Comin D., Mestieri M. (2018), "If Technology Has Arrived Everywhere, Why Has Income Diverged?", in *American Economic Journal: Macroeconomics*, no. 10(3), pp. 137-178.

Comin D., Hobijn B. (2004), "Cross-Country Technology Adoption: Making the Theories Face the Facts", in *Journal of Monetary Economics*, no. 51(1).

Commander S., Nikoloski Z. (2011), "Institutions and Economic Performance: What Can Be Explained?", in *Review of Economics and Institutions*, no. 2(2), pp. 1-36.

Connolly J.M. (2018), "Can Managerial Turnover Be a Good Thing? The Impact of City Manager Change on Local Fiscal Outcomes", in *Public Administration Review*, 78.3, pp. 338-349.

Coviello D., Gagliarducci S. (2017), *Tenure in Office and Public Procurement*, CEP Discussion Paper No. 1465, January.

De Long J.B., Shleifer A. (1993), "Princes and Merchants: European City Growth before the Industrial Revolution", in *Journal of Law and Economics*, no. 30, pp. 671-702.

Eaton S., Kostka G. (2004), "Authoritarian Environmentalism Undermined? Local Leaders' Time Horizons and Environmental Policy Implementation in China", in *The China Quarterly*, 218, pp. 359-380.

Eichengreen B., Park D., Shin K. (2012), "When Fast-Growing Economies Slow Down: International Evidence and Implications for China", in *ASEAN Economic Papers*, no. 11(1), pp. 42-87.

Foldvari P. (2017), "De Facto Versus de Jure Political Institutions in the Long-Run: A Multivariate Analysis, 1820-2000", in *Social Indicators Research*, no. 130, pp. 759-777.

Galang R.M.N. (2017), "Government Efficiency and International Technology Adoption: The Spread of Electronic Ticketing Among Airline", in *Journal of International Business Studies*, no. 43, pp. 631-654.

García-Vega M., Herce J.A. (2011), "Does Tenure in Office Affect Regional Growth? The Role of Public Capital Productivity", in *Public Choice*, 146, pp. 75-92.

Gastil R.D. (1983), *Freedom in the World*, Greenwood, Westport, CT.

Glaeser E., La Porta R., Lopez-de-Silanes L., Schleifer A. (2004), "Do Institutions Cause Growth?", in *Journal of Economic Growth*, no. 9(3), pp. 271-303.

Gilles R.P., Lazarova E.A., Ruys P.H.M. (2015), "Stability in a Network Economy: The Role of Institutions", in *Journal of Economic Behavior & Organization*, Elsevier, vol. 119(C), pp. 375-399.

Hall R.E., Jones C. (1999), "Why do Some Countries Produce So Much More Output Per Worker than Others?", in *The Quarterly Journal of Economics*, no. 114(1), pp. 83-116.

Hodgson G.M. (2006), "What are Institutions?", in *Journal of Economic Issues*, no. 40(1), pp. 1-25.

Hoffman P.T., Norberg K. (1994), "Conclusion", in P. Hoffman, K. Norberg (eds.), *Fiscal Crises, Liberty, and Representative Government 1450-1789*, Stanford University Press, Stanford, CA, pp. 299-310.

Hortas-Rico M., Rios V. (2019), "The Drivers of Local Income Inequality: A Spatial Bayesian Model-Averaging Approach", in *Regional Studies*, no. 53(8), pp. 1207-1220.

Knack S. (1996), "Institutions and the Convergence Hypothesis: The Cross-National Evidence", in *Public Choice*, 87(3/4), pp. 207-228.

Knack S., Kiefer P. (1995), "Institutions and Economic Performance: Cross-country Tests Using Alternative Institutional Measures", in *Economics & Politics*, no. 79(3), pp. 207-227.

Kremer M. (1993), "Population Growth and Technological Change: One Million B.C. to 1990", in *The Quarterly Journal of Economics*, no. 108(3), pp. 681-716.

Lafuente E., Acs Z.J., Sanders M., Szerb L. (2020), "The Global Technology Frontier: Productivity Growth and the Relevance of Kirznerian and Schumpeterian Entrepreneurship", in *Small Business Economics*, no. 55(1), pp. 153-178.

Lin G.C., Zhang A.Y. (2015), "Emerging Spaces of Neoliberal Urban-

ism in China: Land Commodification, Municipal Finance and Local Economic Growth in Prefecture-Level Cities", in *Urban Studies*, no. 52(15), pp. 2774-2798.

Lucas R.E. (2000), "Some Macroeconomics for the 21st Century", in *Journal of Economic Perspectives*, no. 14(1), pp. 159-168.

Mankiw N.G., Romer D., Weil D.N. (1992), "A Contribution to the Empirics of Economic Growth", in *Quarterly Journal of Economics*, no. 107(2), pp. 407-437.

Marquetti A., Foley D. (2011), *Extended Penn World Tables v. 4.0 – EPWT 4.0*, August, https://sites.google.com/a/newschool.edu/duncan-foley-homepage/home/EPWT, accessed March 2012.

Mechkova V., Lührmann A., Lindberg S.I. (2019), "The Accountability Sequence: from De-Jure to De-Facto Constraints on Governments", in *Studies in Comparative International Development*, no. 54, pp. 40-70.

Milanovic B. (2006), "Economic Integration and Income Convergence: Not Such a Strong Link?", in *Review of Economics and Statistics*, 88(4), pp. 659-670.

Musacchio A., Werker E. (2016), "Mapping Frontier Economies: Where to Play and How to Win", in *Harvard Business Review*, no. 94, pp. 40-48.

North D.C. (1981), *Structure and Change in Economic History*, Norton and Co, New York.

– (1990), *Institutions, Institutional Change, and Economic Performance*, Cambridge University Press, New York.

O'Rourke K.H. (2002), "Globalization and Inequality: Historical Trends", in *Swiss Institute for International Economics and Applied Economics Research*, no. 57(01), pp. 65-104.

Pribble J. (2015), "The Politics of Building Municipal Institutional Effectiveness in Chile", in *Latin American Politics and Society*, 57(3), pp. 100-121.

Polity5 Project (2022), *(1800-2018). Political Regime Characteristics and Transitions*, http://www.systemicpeace.org/inscrdata.html, accessed 20 February 2022.

Rodrik D. (2013), "*The Past, Present, and Future of Economic Growth*, Working Paper 1, Global Citizens Foundation, Uttar Pradesh.

Rodríguez-Pose A., Zhang M. (2019), "Government Institutions and the Dynamics of Urban Growth in China", in *Journal of Regional Science*, no. 59(4), pp. 633-668.

Romer P.M. (1986), "Increasing Returns and Long-Run Growth", in *Journal of Political Economy*, no. 94(5), pp. 1002-1037.

Scully G.W. (1988), "The Institutional Framework and Economic Development", in *Journal of Political Economy*, no. 96, pp. 52-62.

Shi Y., Chang C.P., Jang C.L., Hao Y. (2018), "Does Economic Performance Affect Officials' Turnover? Evidence from Municipal Government Leaders in China", in *Quality and Quantity*, 52, pp. 1873-1891.

Solow R.M. (1956), "A Contribution to the Theory of Economic Growth", in *Quarterly Journal of Economics*, no. 70(1), pp. 65-94.

van Leeuwen B., Calabrese M., Wang M. (2023), "Italy's Total Factor Productivity in a Global Economy: Growth and Spillover Effects (c. 1400-2010)", in *Italian Economic Journal*.

van Leeuwenand B., Li J. (2021), "Inequality in Educational Achievement", in J.L. van Zanden, M. Mira d'Ercole, M. Malinowski, A. Rijpma (eds.), *How Was Life?, Volume II: New Perspectives on Well-Being and Global Inequality since 1820*, OECD Publishing, Paris, pp. 147-162.

Van Zanden J.L., Buringh E., Bosker M. (2012), "The Rise and Decline of European Parliaments, 1188-1789", in *Economic History Review*, no. 65, pp. 835-861.

Wolman H., Strate J., Melchior A. (1996), "Does Changing Mayors Matter?", in *The Journal of Politics*, 58, no. 1, pp. 201-223.

Zhou Q., Zeng J. (2018), *Promotion Incentives, GDP Manipulation and Economic Growth in China: How Do Sub-National Officials Behave under Performance Pressure?*, 19 October, https://ssrn.com/abstract=3269645 or http://dx.doi.org/10.2139/ssrn.3269645.

Zhu K., Dong S., Xu S.X., Kraemer K.L. (2006), "Innovation Diffusion in Global Contexts: Determinants of Post-Adoption Digital Transformation of European Companies", in *European Journal of Information Systems*, no. 15(6).

APPENDIX A
List of Data by Country and Time Period

Country	City	Start Year	End Year	Link
Albania	Tirana	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Tirana
Armenia	Yerevan	1870	2010	https://en.wikipedia.org/wiki/Mayor_of_Yerevan
Austria	Linz	1840	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Linz
Argentina	Buenos Aires	1880	2010	https://en.wikipedia.org/wiki/List_of_mayors_and_chiefs_of_government_of_Buenos_Aires_City
Australia	Darwin	1850	2010	https://en.wikipedia.org/wiki/List_of_mayors_and_lord_mayors_of_Hobart
Belgium	Brussels	1580	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_the_City_of_Brussels
Bosnia	Sarajevo	1890	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Sarajevo
Botswana	Gaborone	1960	2010	https://en.wikipedia.org/wiki/Gaborone_City_Council#List_of_mayors
Brazil	Porto Alegre	1890	2010	https://en.wikipedia.org/wiki/Mayor_of_Porto_Alegre
Bulgaria	Sofia	1870	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Sofia
Canada	Saint John	1820	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Saint_John,_New_Brunswick
Chile	Las Condes	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Las_Condes
China	Beijing	1900	2010	https://en.wikipedia.org/wiki/Politics_of_Beijing
Colombia	Bogota	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Bogot%C3%A1
Croatia	Split	1800	2010	https://en.wikipedia.org/wiki/Mayor_of_Split
Czech Republic	Brno	1970	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Brno
Democratic Republic of the Congo	Kinshasa	1960	2010	https://en.wikipedia.org/wiki/List_of_governors_of_Kinshasa
Denmark	Copenhagen	1900	2010	https://en.wikipedia.org/wiki/List_of_lord_mayors_of_Copenhagen
Egypt	Cairo	1950	2010	https://en.wikipedia.org/wiki/List_of_governors_of_Cairo_Governorate
Estonia	Tallinn	1870	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Tallinn
Ethiopia	Addis Ababa	1900	2010	https://en.wikipedia.org/wiki/Mayor_of_Addis_Ababa
Finland	Helsinki	1870	2010	https://en.wikipedia.org/wiki/City_Council_of_Helsinki#Mayor
France	Bordeaux	1790	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Bordeaux
Germany	Bonn	1800	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Bonn
Greece	Athens	1830	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Athens
India	Mumbai	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Mumbai
Indonesia	Jakarta	1940	2010	https://en.wikipedia.org/wiki/Governor_of_Jakarta
Iran	Tehran	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Tehran
Italy	Rome	1870	2010	https://en.wikipedia.org/wiki/Mayor_of_Rome#List_of_Mayors_of_Rome
Kazakhstan	Almaty	1990	2010	https://en.wikipedia.org/wiki/%C3%84kim_of_Almaty#List
Kenya	Nairobi	1920	2010	https://en.wikipedia.org/wiki/Mayor_of_Nairobi
Madagascar	Antananarivo	1890	2010	https://en.wikipedia.org/wiki/Mayor_of_Antananarivo
Malaysia	Kuala Lumpur	1980	2010	https://en.wikipedia.org/wiki/Mayor_of_Kuala_Lumpur
Mexico	Mexico City	1880	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Mexico_City
Namibia	Windhoek	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Windhoek
Netherlands	Amsterdam	1410	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Amsterdam

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Country	City	Start Year	End Year	Link
New Zealand	Wellington	1840	2010	https://en.wikipedia.org/wiki/Mayor_of_Wellington
Norway	Oslo	1830	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Oslo
Peru	Lima	1860	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Lima
Philippines	Manila	1900	2010	https://en.wikipedia.org/wiki/Mayor_of_Manila
Poland	Warsaw	1780	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Warsaw
Portugal	Lisbon	1840	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Lisbon
Romania	Bucharest	1860	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Bucharest
Russia	Moscow	1900	2010	https://en.wikipedia.org/wiki/Mayor_of_Moscow#List_of_heads_of_Moscow_government
South Africa	Johannesburg	1890	2010	https://en.wikipedia.org/wiki/Mayor_of_Johannesburg#List_of_Mayors
South Korea	Seoul	1940	2010	https://en.wikipedia.org/wiki/Mayor_of_Seoul
Spain	Madrid	1450	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Madrid
Sweden	Stockholm	1920	2010	https://en.wikipedia.org/wiki/List_of_municipal_commissioners_for_finance_of_Stockholm
Tanzania	Dar es Salaam	1940	2010	https://en.wikipedia.org/wiki/Mayor_of_Dar_es_Salaam
Turkey	Ankara	1900	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Ankara
Ukraine	Odessa	1790	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Odessa,_Ukraine
UK	Birmingham	1830	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_Birmingham
USA	New York	1660	2010	https://en.wikipedia.org/wiki/List_of_mayors_of_New_York_City