# The political economy of productivity growth

Fernando Alexandre [a], Pedro Bação [b], Francisco José Veiga [a],[*]

[a] *Universidade do Minho, Escola de Economia e Gestão & NIPE, Braga, Portugal*
[b] *Universidade de Coimbra, CeBER, Faculty of Economics, Coimbra, Portugal*

ABSTRACT

This paper empirically evaluates the importance of institutions and political stability for productivity growth. We explore this relation in a novel way by evaluating the impact of political and institutional variables on the structural change and within-sector components of labor productivity growth. Our results do not provide robust evidence that democracy/autocracy affects productivity growth, either through structural change or within-sector productivity growth. However, political instability appears to have adverse effects on both components of productivity growth. Our estimates also show that economic freedom is associated with within-sector productivity growth. More precisely, our results suggest that an institutional context that favors business dynamism, that is, free entry, the growth of the more productive firms and the exit of the less productive, may be crucial for long-run productivity growth and economic development.

## 1. Introduction

This paper contributes to the discussion of the causes of sluggish productivity growth in the last decades by assessing the importance of institutions and political stability for the structural change and within-sector components of productivity growth. The topic of productivity growth has been a central issue, not only because of its importance for the economic development of individual countries, but also in light of the recent evolution of the world economy, which has been marked by the decline of the West and the rise of developing countries, namely in East Asia and, most importantly, of China. The implications of the rise of the East extend far beyond its growing share of world GDP. The fact that the Western political and economic regime appears to be failing to produce robust economic growth and development, in sharp contrast with the single-party regime of China, has caused considerable soul-searching in the West, especially in Europe. This context has brought to the centerstage questions about which institutional features are more growth-friendly and may foster economic development.

One explanation for the slowdown in aggregate productivity growth emphasizes the role of the misallocation of resources (Decker et al., 2017), which is influenced by the business environment created by institutional and political features. In fact, there is a large literature indicating that institutions are important determinants of economic growth and development.[1] Among institutions, the degree of democracy has received special attention and has fueled controversy, in contrast with the consensus in the literature regarding the positive effects of economic freedom on economic growth (Olson, 1982; Barro, 1996; Acemoglu et al., 2019). Non-democratic regimes are often associated with extensive government intervention in, and control of, the economy (de Haan and Sturm, 2003; Rode and Gwartney, 2012). The historical performance of such high levels of intervention is poor, especially given the collapse of the Soviet Union, which indeed appeared to mark the "end of history" (Fukuyama, 1992) for planned economies. Milanovic

---

* Corresponding author.
  *E-mail addresses:* falex@eeg.uminho.pt (F. Alexandre), pmab@fe.uc.pt (P. Bação), fjveiga@eeg.uminho.pt (F.J. Veiga).
  [1] See, among others, North (1990), Hall and Jones (1999), Acemoglu et al. (2005), de Haan et al. (2006), Acemoglu and Robinson (2012).

(2019, p. 2) argues that capitalism became "not only the dominant, but the sole socio-economic system in the world". Capitalism's popularity may have been enhanced by the fact that economic freedom appears to impact positively on the labor share, thus benefitting a substantial part of the population (Young and Lawson, 2014; Ng, 2015). Iversen and Soskice (2019) go further and argue that there is a symbiotic relationship between capitalism and democracies. However, the strong growth of China and other East Asian countries gave new support to the possibility that non-democratic regimes, or less than fully democratic regimes, may be more efficient in reallocating resources. Evidence in favor of the hypothesis that democracy may be detrimental to growth is provided by Barro (1996) and Tavares and Wacziarg (2001). Nevertheless, Tavares and Wacziarg (2001) add that there are certain dimensions of democracy that favor growth by stimulating investment in human capital.

A rebuttal of the negative view of democracy is offered in Acemoglu et al. (2019), who argue that democracy does cause growth in a significant and sizeable way, by stimulating investment, schooling, economic reforms and public goods provision, and by reducing social unrest. However, Acemoglu et al. (2019) find no evidence of an impact of democracy on total factor productivity.

In this paper, we focus on the relevance of institutions and political stability to productivity growth by distinguishing their effects on the structural change and within-sector components (McMillan et al., 2014). The structural change component captures the impact on productivity growth from a better allocation of resources across sectors. The within-sector component measures the impact on productivity resulting from resources being used more efficiently within sectors.

Our empirical analysis is based on two panel datasets, one covering a very long period (1950–2007) and the other covering more recent decades (1990–2018). The paper provides two main contributions to the literature. First, it is among the first studies to make use of a novel dataset (de Vries et al., 2021), which provides sector level data for a larger number of developing countries than previously available datasets, and that covers the period following the international financial crisis. Second, to the best of our knowledge, this is the first study investigating the impact of institutions and political stability on the structural change and within-sector components of labor productivity growth. Our main findings are the following. Regarding the effect of democracy, our results cast doubt on the relevance of the political regime for labor productivity growth. Additionally, the econometric results suggest that government stability has a positive effect on both the within-sector and the structural change components of productivity growth. Finally, economic freedom has a positive effect only on within-sector productivity growth.

The paper is organized as follows. Section 2 reviews the literature on institutions and productivity growth. Section 3 describes the data and the decomposition of productivity growth into the within-sector and structural change components. Section 4 presents the econometric models, and Section 5 reports and discusses the results. Section 6 concludes.

## 2. Institutions, political stability and productivity growth

In this paper, we contribute to the literature on the effects of institutions on economic growth and development by investigating the link between political and institutional variables on the two components of productivity growth (within and structural change) defined above. These two components have played significantly different roles over the different stages of economic development.

Historically, economic growth is associated with a major structural change: the reallocation of resources from agriculture to manufacturing. The shift of resources from agriculture to manufacturing had a strong positive impact on aggregate productivity growth — see, for example, Herrendorf et al. (2014) and McMillan et al. (2017). More recently, lower productivity growth has been associated to the reallocation of resources from manufacturing to services (Atolia et al., 2020). This structural change has been associated with lower aggregate productivity growth as the services sector is labor intensive and, in most cases, productivity gains are limited (Baumol, 2012). However, structural change is an ongoing process, fueled by events and innovations that shift demand from one sector to another, leading to changes in the weight of sectors. When resources flow towards the most productive sectors, productivity increases and GDP grows faster.[2]

Besides the productivity gains that arise from the reallocation of labor from less productive to more productive sectors, another source of productivity growth consists of changes that reduce the misallocation of resources within sectors (McMillan et al., 2014), such as the introduction of new technologies and new management processes, the entry of new and more innovative firms, and the exit of unproductive firms. The issue of the exit (or rather the survival) of unproductive firms has become especially relevant in the face of two recent developments. First, recent studies on the productivity slowdown in OECD countries conclude that the stagnation in aggregate productivity is the result of an increasing polarization between frontier and laggard firms (Andrews et al., 2016). That polarization between frontier and laggard firms has been linked to changes in technological processes, namely digitalization and other dimensions of the industrial revolution 4.0, that increase the complexity of the production processes and require a combination of intangible capital and high-skilled labor (Haskel and Westlake, 2017). Second, the increasing productivity gap between frontier and laggard firms is an indicator of misallocation, as discussed in Hsieh and Klenow (2009).

Policies that facilitate the entry and exit of firms may play a role in decreasing polarization and reducing the misallocation of resources within sectors, - see, for example, Andrews et al. (2016) and Ciccone and Papaioannou (2007). An implication of this is the expectation that higher degrees of economic freedom, in the form of a smaller regulatory burden, greater freedom to trade, and smaller government intervention in the economy are associated with greater within sector productivity growth rates (e.g., Decker et al. (2018)). For similar reasons, economic freedom may also be important for structural change. We investigate this issue in our empirical analysis.

---

[2] McMillan et al. (2014) and Timmer et al. (2015) provide an overview of this process in developing countries, while Rodrik (2011) discusses policy choices.

Another kind of rights—political rights—may also influence within-sector and structural change productivity growth. Nevertheless, as mentioned in the Introduction, the relation between democracy and growth is highly controversial. For example, Aghion et al. (2008) present evidence that democracy may be a constraint on economic growth for countries with low levels of development, but add that political rights may foster growth in more advanced sectors. Aghion et al. (2008) argue that one possible explanation for that relation is the positive effect of democracy and political rights on the freedom of entry in markets.[3] In the same vein, Acemoglu and Robinson (2012) argue that history and evidence support the hypothesis that democratic and open economies are more prone to innovation and, therefore, favor economic growth. However, recent technological advances in China (e.g., 5G technology and Artificial Intelligence) indicate that the relation between political rights, innovation, and economic growth is more complex than suggested by Acemoglu and Robinson (2012) or by the modernization hypothesis proposed by Lipset (1959).

Two reasons why democracy may in some cases be a hindrance to economic growth have to do with the incentives created by the political cycle. First, the growth of some economic sectors may result, not only in a growing economic power, but also in a stronger political power of the groups representing the growing sectors (Acemoglu et al., 2005). This power may give those groups the capacity to influence policies that affect their position in the economy. Namely, those groups may use their influence to block adverse changes, i.e., to block the structural change of the economy. Second, even if such political power does not exist, the weight of some industries in terms of output and employment may be so high that their contraction can result in recessionary effects that are not compensated for by ongoing growth in smaller and more productive industries. In that case, the political cycle may induce governments to favor short-sighted policies and delay the structural change in the economy, especially when elections are near or when the average tenure of governments is short (Rodrik, 1996).

On the other hand, in a democratic regime it may be easier to control the power of interest groups, which might otherwise be favored by a dictatorship (Acemoglu and Robinson, 2012). In this context, the setup of regulation agencies and of an institutional environment that promotes business dynamism, may be crucial for achieving higher efficiency through the reallocation of resources.

The development of political rights may be more important for within sector productivity growth than for structural change productivity growth, for restrictions on business dynamism often take the form of bureaucratic demands that burden prospective entrants. In a society where political rights are strong, entrepreneurs negatively affected by those restrictions may find it easier to make their voices heard (Aghion et al., 2008).

In the case of structural change, the social disruption caused by it — with workers of failed firms facing long unemployment spells or the need to move to faraway locations — may be such that the democratic process may actually lead to decisions that block the reallocation of resources across sectors. Regardless of the political regime, the literature suggests that political instability has a negative impact on growth (Alesina et al., 1996; Chen and Feng, 1996; Jong-A-Pin, 2009; Aisen and Veiga, 2013; Alcántar-Toledo and Venieris, 2014), inhibiting investment and total factor productivity growth. Thus, we expect that political stability has a positive impact on both the within-sector and the structural change components of labor productivity growth.

The above views on the relation between democracy and growth are closely related to the concept of "political capitalism" discussed in Holcombe (2018). According to Holcombe (2018), capitalist economies appear to have a tendency to evolve towards political capitalism, i.e., a system in which economic outcomes are essentially determined by political connections rather than by innovation and productivity growth. Its defining feature is the cooperation between the economic and political elites with the goal of maintaining or reinforcing their status, a cooperation which may emerge under both democratic and autocratic regimes. The analysis of Holcombe (2018) implies that one of the main economic casualties of political capitalism is productivity. Under political capitalism, the economic elite will use its access to public instruments (granted to it by the connections to the political elite) to reduce business dynamism and thus maintain the status quo. Consequently, in that economic and political system productivity growth will be below potential.

Based on the above, our main testable hypotheses are the following:

**Hypothesis 1:** Democracy has positive effects on within-sector and structural change productivity growth.

**Hypothesis 2:** Economic freedom promotes within-sector and structural change productivity growth.

**Hypothesis 3:** Political stability fosters within-sector and structural change productivity growth.

## 3. Data

In this section, we start by providing a brief description of the two datasets compiled. We then present the method used to decompose labor productivity into a within sector effect and a structural change effect. This decomposition plays a major role in our econometric approach, which is described in the next section.

---

[3] de Haan and Sturm (2003) and Rode and Gwartney (2012) provide additional empirical evidence that democracies are more supportive of economic freedom. Likewise, the empirical evidence presented in Méon and Sekkat (2021) indicates that democratic transitions improve a variety of institutional outcomes, such as corruption and law and order.

**Table 1**
The GGDC 10-Sector and Economic Transformations Databases.

| 10-Sector Database | | Economic Transformations Database | |
|---|---|---|---|
| ISIC Rev. 3.1 code | Sector name | ISIC Rev. 4 code | Sector name |
| AtB | Agriculture | A | Agriculture |
| C | Mining | B | Mining |
| D | Manufacturing | C | Manufacturing |
| E | Utilities | D+E | Utilities |
| F | Construction | F | Construction |
| G+H | Trade services | G+I | Trade services |
| I | Transport services | H | Transport services |
| J+K | Business services | J+M+N | Business services |
| L,M,N | Government services | K | Financial services |
| O,P | Personal services | L | Real estate |
| | | O+P+Q | Government services |
| | | R+S+T+U | Other services |

### 3.1. Description of the datasets

Data on value added and employment at the sector level were first obtained from the Groningen Growth and Development Center (GGDC) 10-Sector Database (de Vries et al., 2015; Timmer et al., 2015), which covers 42 countries and the period from 1950 to, at most, 2012. In order to increase country coverage, these data were complemented with that of the EU KLEMS Database (O'Mahony and Timmer, 2009) and that of the OECD's STAN Database for Structural Analysis. In order to assure the compatibility of these three databases, data based on ISIC Rev. 3.1 were always used and aggregated into the 10 sectors of the GGDC 10-Sector Database — see Table 1. The combined dataset covers a maximum of 64 countries (see Table A.1 in Appendix A), 23 of which are advanced economies and 41 are emerging/developing economies (we use Barro and Lee (2010) for the identification of the advanced economies). Since the KLEMS database based on ISIC Rev. 3.1 only has data until 2007, we restrict this dataset (henceforth, Dataset 1) to the 1950–2007 period.

A second dataset was compiled using the recently released GGDC's Economic Transformations Database - ETD (de Vries et al., 2021), which covers 51 economies in Africa, Asia, and Latin America, for 12 sectors of the total economy, from 1990 until 2018. Again, to increase country coverage, we complemented the ETD with data from the latest versions of the EU KLEMS and of the OECD's STAN databases. To assure the compatibility of these three databases, data based on ISIC Rev. 4 were always used and aggregated into the 12 sectors of the GGDC's ETD Database — see Table 1. This second dataset (henceforth, Dataset 2) covers a total of 83 countries (23 advanced and 60 emerging), for the period 1990–2018 (see Table A.2 in Appendix A).

Annual data on economic, political and institutional variables, starting in 1950, were gathered for as many countries as possible, covering all regions of the world. The sources of macroeconomic and financial data were the Penn World Table (PWT) Version 10.0 (Feenstra et al., 2013) and the World Bank's Databank, with most variables obtained from the World Development Indicators (WDI). Education data was obtained from Barro and Lee (2010). Political and institutional data were obtained from the Polity5 Database (Marshall and Gurr, 2020), the Database of Political Institutions - DPI (Cruz et al., 2018), the Varieties of Democracy (V-dem) Database (Coppedge et al., 2020), the Economic Freedom of the World Annual Report - EFW (Gwartney et al., 2020), the International Country Risk Guide (ICRG), the Cross National Time Series Data Archive - CNTS (Banks and Wilson, 2019), and the Worldwide Governance Indicators - WGI (Kaufmann et al., 2010).

The list of institutional and political variables considered is extensive. As measures of democracy we employ the *Autocracy–Democracy index* (Polity5), the *Checks and Balances* indicator (DPI), and the *Regimes of the World* index (V-dem). The *Autocracy–Democracy* and the *Regimes of the World* indices increase as the political regime moves from full autocracy to full democracy. The Checks and Balances indicator increases with the importance of independent institutions and alternative candidates.

To proxy economic freedom, we use the *Economic Freedom of the World Index* (EFW), its five subindices (government size, legal system and property rights, sound money, trade, and regulation), and several of their components. The indices are defined so that larger values indicate an environment of greater economic freedom. Therefore, the government size index increases when the size of the government decreases (which presupposes that bigger governments—which tax more, spend more, and are proner to debt crises—are associated with an environment that negatively affects private businesses). The legal system and property rights index increases when the legal system is perceived to function better and provides an effective enforcement of property rights. The sound money index increases when inflation is stable and low, and prices are free from administrative controls. The trade index increases when the level of trade tariffs and of other barriers to international trade decrease. Finally, the regulation index increases when the regulatory burden on the credit, labor, and business markets is lower.

Several alternative proxies of political (in)stability are considered. From the ICRG dataset we make use of *Government Stability* (evaluated on the basis of government unity, legislative strength and popular support), *External Conflict* (with high values reflecting absence of conflicts), and *Ethnic Tensions* (with high values reflecting low risks stemming from ethnic tensions). From the CNTS data archive we use the data on *General Strikes* (the number of major strikes contesting the national government), *Anti-Government Demonstrations* (major demonstrations contesting the national government), and *Government Crises* (the number of crises affecting the national government). Finally, from the WGI database we use the indicator for *Political stability and absence of violence/terrorism*.

**Table 2**

Growth rates and shares of value added by sector (Dataset 1 - ISIC 3).

*Source:* 10-Sector Database and EU KLEMS (GGDC) and STAN (OECD).

| Sector | Average of the Annual Growth Rates of Value Added (1970–2007) | | Average Sector Shares of Value Added | | | |
| | Advanced Economies | Emerging Economies | Advanced Economies | | Emerging Economies | |
| | | | 1970 | 2007 | 1970 | 2007 |
| --- | --- | --- | --- | --- | --- | --- |
| Agriculture | 1.68 | 3.05 | 3.79 | 2.10 | 26.68 | 11.87 |
| Mining | 2.28 | 5.07 | 2.39 | 2.61 | 10.08 | 4.93 |
| Manufacturing | 2.43 | 5.76 | 19.52 | 17.78 | 14.28 | 18.49 |
| Utilities | 3.27 | 6.72 | 2.01 | 2.14 | 1.10 | 2.39 |
| Construction | 1.44 | 5.37 | 11.46 | 6.74 | 7.13 | 6.07 |
| Trade services | 2.83 | 5.56 | 15.96 | 15.98 | 15.09 | 17.03 |
| Transport services | 4.06 | 6.89 | 5.34 | 8.05 | 4.77 | 9.35 |
| Business services | 5.11 | 7.72 | 11.85 | 21.41 | 4.21 | 12.88 |
| Government services | 2.54 | 5.11 | 22.72 | 19.15 | 11.54 | 12.21 |
| Personal services | 2.49 | 5.77 | 4.96 | 4.03 | 5.12 | 4.78 |
| Total Economy | 2.76 | 4.86 | | | | |
| Observations/Countries | 821 | 1173 | 20 | 21 | 24 | 34 |

### 3.2. Decomposition of labor productivity growth

Labor productivity growth can be decomposed in two components. First, capital accumulation, technological change, or reduction of misallocation across plants can lead to higher productivity within economic sectors. Second, the movement of labor from low-productivity to high-productivity sectors can increase the overall labor productivity in the economy.

Following McMillan et al. (2014), we decompose changes in labor productivity—measured by the ratio of value added to employment—as follows:

$$\Delta P_t = \sum_{i=1}^{10(11)} S_{i,t-k}(p_{i,t} - p_{i,t-k}) + \sum_{i=1}^{10(11)} p_{i,t}(S_{i,t} - S_{i-t-k}). \qquad (1)$$

where $P_t$ and $p_{i,t}$ refer to, respectively, economy-wide and sectoral levels of the productivity of labor at time $t$, $S_{i,t}$ is the share of employment in sector $i$ at time $t$, the $\Delta$ operator denotes the change in productivity from $t - k$ to $t$, with $k$ being the length of the time period considered.

The first term in the right-hand side of Eq. (1) is the sum of labor productivity growth within the individual 10 (or 11) sectors,[4] weighted by the sector employment shares at the beginning of the time period considered. The second term measures the productivity effect of labor re-allocations across different sectors. Following McMillan et al. (2014), we call the first term the "within" component of productivity growth, while the second term is the "structural change" component.

In order to obtain the decomposition of the growth rate of labor productivity over period $t-k$ to $t$, we divide both sides of Eq. (1) by $P_{t-k}$.

$$\frac{\Delta P_t}{P_{t-k}} = \underbrace{\frac{\sum_{i=1}^{10(11)} S_{i,t-k}(p_{i,t} - p_{i,t-k})}{P_{t-k}}}_{\text{Within}} + \underbrace{\frac{\sum_{i=1}^{10(11)} p_{i,t}(S_{i,t} - S_{i-t-k})}{P_{t-k}}}_{\text{Structural change}}. \qquad (2)$$

Table 2 presents the sector averages of the annual growth rates of value added, for advanced and emerging economies, using Dataset 1 (based on ISIC Rev. 3.1) from 1970 to 2007. The sector shares of value added in 1970 and 2007 are also presented.[5] One striking feature of Table 2 is that average growth rates in emerging economies are much higher than in advanced economies across all sectors. This reflects the rapid economic convergence of emerging economies, which have been approximating the standards of living in advanced economies. Both in advanced and in emerging economies, the fastest growing sectors are associated with services, in particular business services. Unsurprisingly, in our sample, structural change appears to have been much more significant in emerging economies than in advanced economies. In fact, the only major change in the structure of advanced economies was the increase in the share of business services, while in emerging economies there have been large changes in several sectors. Namely, the importance of agriculture and mining declined, and the share of manufacturing, transport services and business services increased markedly.

Fig. 1 illustrates the decomposition of labor productivity growth (in percentage points), from 1950 to 2007, for the full sample, for emerging and advanced economies, and for three subperiods, using the first dataset described above (based on the 10-Sector

---

[4] Due to the high volatility of the Real Estate sector, it was excluded from the analysis of Dataset 2. That is, we work with 11 of the 12 sectors of that database. This exclusion was not possible in Dataset 1, as the real estate is included in the Business Services sector.

[5] We start in 1970 (instead of 1950) because of missing sector data for many countries in the 1950s and 1960s, and also because our most relevant estimations cover the period starting in 1970. Similar statistics for Dataset 2 (based on ISIC Rev. 4, 1990–2018) are presented in Table A.3 of Appendix A.
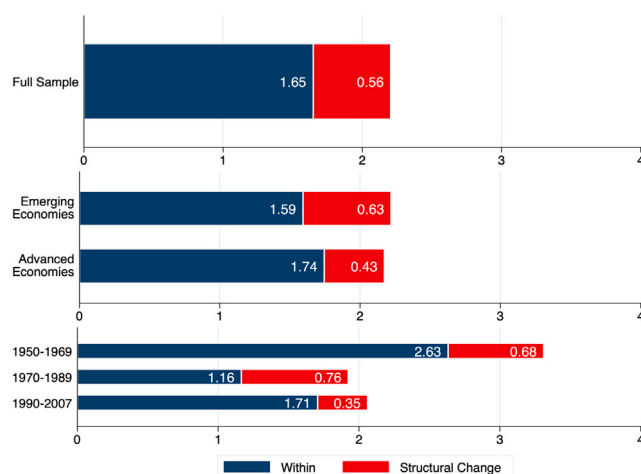
**Fig. 1.** Decomposition of the average annual growth rate of labor productivity, in percentage points, 1950–2007 (based on ISIC Rev. 3.1).

Database). On average, there is a considerably larger contribution of the within component (1.65%) than of structural change (0.56%) for the average annual growth rate of labor productivity (2.21%). The average within effect is higher in advanced than in emerging economies, while the opposite is true for the structural change effect. This difference is to be expected as greater opportunities for labor re-allocations from less productive sectors to more productive ones tend to exist in emerging economies, some of which may still have large employment shares in agriculture and other primary sectors—see McMillan et al. (2014). Overall, labor productivity growth was higher in emerging (2.62%) than in advanced economies (2.17%).

The structure of the world economy has changed considerably over recent decades, in particular since 1990, with the acceleration of globalization and the revolution in information and communication technologies, besides the collapse of the Soviet Union and the integration of China into world trade. When splitting the sample in three sub-periods, we see that overall productivity growth and the contribution of the within component were considerably larger in the period 1950–69 than in the later periods. Labor productivity since 1990 was higher than from 1970 to 1989, mainly due to the within effect. In fact, the contribution of the structural change component since 1990 was much smaller than in the previous two periods. This may be due to the fact that many opportunities for productivity promoting labor re-allocations were taken advantage of before 1990.

Fig. 2, based on Dataset 2, covers the period 1990–2018. Again, the within effect is greater than the structural change component for the full sample and for all subsamples. Both components were larger for emerging economies than for advanced ones, and before the international financial crisis (1990–2007) than after it.[6] The contribution of the within component is only marginal in advanced economies, while in emerging countries it accounted for 28% of total productivity growth.

In Fig. 3, the decomposition of labor productivity growth is made over the three sub-periods, by group of countries. While productivity growth was higher in advanced than in emerging economies over the first two subperiods, it was considerably smaller after 1990. This evolution reflects the well-known process of economic convergence between emerging and developed countries since the 1990s, dubbed the "Great Convergence" by Baldwin (2016). It should also be noticed that the contribution of structural change decreased over time in advanced economies, becoming very small in the last period (1990–2007). The contribution of structural change also declined in emerging economies since 1990, but not as dramatically as in advanced economies. Thus, in the last period the within component became an even more important source of productivity gains.

Fig. 4 illustrates the large decrease in the annual growth rate of labor productivity (from 1.96% to 0.42%) which occurred in advanced economies after the start of the international financial crisis in 2007. Although there was also a decrese in emerging economies, it was much smaller (from 2.65% to 2.30%). It is also worth noting that the contribution of the structural change component became negative in the last period.

In the next sections we employ econometric models to assess the relevance of the political regime, institutions and stability to productivity growth, distinguishing between the impact on within and structural change productivity growth.

## 4. Econometric models

A first set of estimations analyzes the effects of democracy, economic freedom and political instability on labor productivity growth. Then, in order to identify the channels through which those effects are transmitted to productivity, we conduct separate estimations using the within and structural change components as dependent variables. We next describe the econometric models used in the labor productivity growth estimations and in those for its components.

---

[6] Since the numbers of countries and of sectors considered in the two datasets are different, it is not strange that the values indicated in Fig. 2 for the subperiod 1990–2007 are not equal to those shown in Fig. 1.
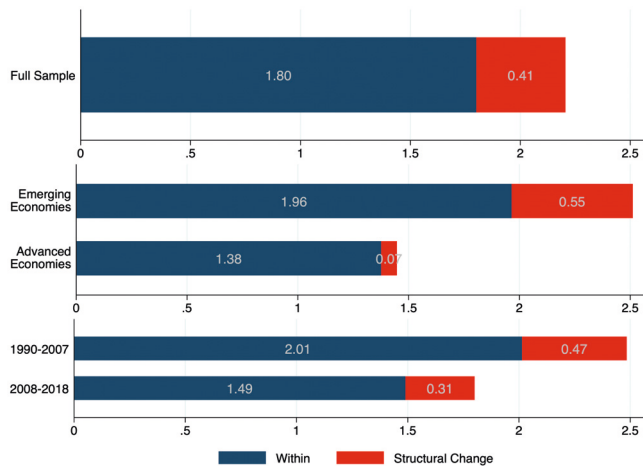
**Fig. 2.** Decomposition of the average annual growth rate of labor productivity, in percentage points, 1990–2018 (based on ISIC Rev. 4).
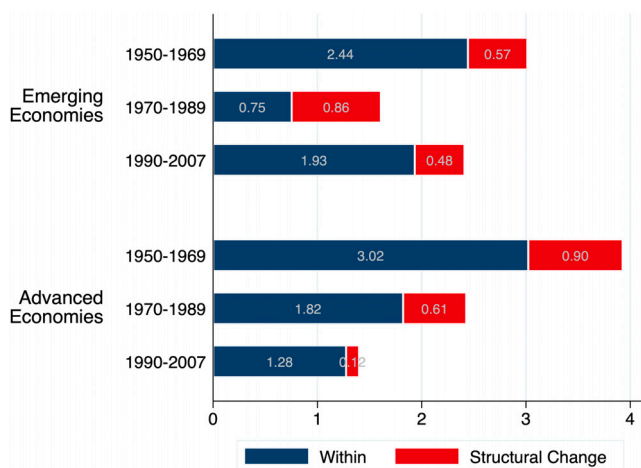


**Fig. 3.** Decomposition of average annual labor productivity growth: Country groups and sub-periods, in percentage points (based on ISIC Rev. 3.1).
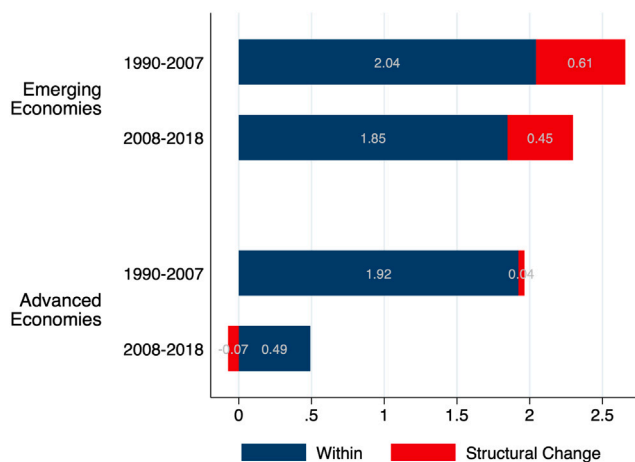


**Fig. 4.** Decomposition of average annual labor productivity growth: Country groups and sub-periods, in percentage points (based on ISIC Rev. 4).

**Table 3**
Labor productivity growth - Data based on ISIC Rev. 3.1 (1950–2007).

|  | (1) FE | (2) Sys-GMM | (3) FE | (4) Sys-GMM | (5) FE | (6) Sys-GMM |
|---|---|---|---|---|---|---|
| L. Log(Labor Productivity) | −0.0316*** | −0.0169** | −0.0406*** | −0.0169* | −0.0433*** | −0.0170** |
|  | (−3.138) | (−2.319) | (−4.220) | (−1.717) | (−2.697) | (−2.317) |
| Investment (%GDP) | 0.123*** | 0.173*** | 0.0595* | 0.161** | 0.00135 | 0.0329 |
|  | (3.683) | (2.592) | (1.893) | (2.105) | (0.0397) | (0.698) |
| L. Years of schooling | −0.000841 | 0.00137 | −0.00392* | 0.00194 | −0.00632** | 0.00140 |
|  | (−0.386) | (0.309) | (−1.686) | (0.485) | (−2.028) | (0.389) |
| Population growth rate | −0.331 | −1.399* | −0.747** | −0.704 | −0.962** | −2.520*** |
|  | (−0.953) | (−1.820) | (−2.462) | (−0.582) | (−2.532) | (−4.566) |
| Trade (% GDP) | 0.00793 | 0.0255* | 0.0132** | 0.00814 | 0.0221*** | 0.00359 |
|  | (1.190) | (1.807) | (2.194) | (0.323) | (3.966) | (0.216) |
| Autocracy-Democracy | −0.000589 | −0.000819 | −0.000819** | −0.00205** | −0.000123 | −0.00166** |
|  | (−1.431) | (−0.953) | (−2.023) | (−1.971) | (−0.248) | (−2.386) |
| Economic Freedom |  |  | 0.00941*** | 0.0159** | 0.00963*** | 0.00470 |
|  |  |  | (4.251) | (2.090) | (3.169) | (0.621) |
| Government Stability |  |  |  |  | 0.00417*** | 0.00663*** |
|  |  |  |  |  | (3.365) | (3.080) |
| Initial year | 1950 | 1950 | 1970 | 1970 | 1980 | 1980 |
| Observations | 505 | 505 | 449 | 449 | 320 | 320 |
| Number of countries | 61 | 61 | 61 | 61 | 60 | 60 |
| Adj. R-squared | 0.268 |  | 0.335 |  | 0.411 |  |
| Instruments |  | 60 |  | 51 |  | 53 |
| Hansen, p-value |  | 0.140 |  | 0.231 |  | 0.325 |
| AR1, p-value |  | 0.00219 |  | 0.00177 |  | 0.0125 |
| AR2, p-value |  | 0.410 |  | 0.433 |  | 0.690 |

Notes: Fixed effects and System-GMM regressions, including 5-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

## 4.1. Labor productivity growth regressions

The baseline empirical model used in the estimations for the growth rate of labor productivity can be presented as follows:

$$\ln P_{i,t} - \ln P_{i,t-k} = \beta \ln P_{i,t-k} + \gamma E_{i,t-k} + \mathbf{X}'_{i,t}\delta + \mathbf{I}'_{i,t}\phi + \mu_i + \eta_t + \epsilon_{i,t} \tag{3}$$

where $\ln P_{i,t}$ is the natural logarithm of labor productivity for country $i$ at time $t$, and $k$ is the length of the periods considered. $E_{i,t-k}$ is initial education (proxied by years of schooling $k$ years ago) and $\mathbf{X}_{i,t}$ is a vector of other control variables, calculated as $k$-year averages. $\mathbf{I}_{i,t}$ is a vector of political and institutional variables, also calculated as $k$-year averages. $\mu_i$ are the individual fixed effects of country $i$, $\eta_t$ are the time-specific effects of period $t$, and $\epsilon_{i,t}$ is the error term. This model, essentially adds proxies of democracy, economic freedom and political instability to the set of variables considered in the seminal empirical literature on economic growth (Mankiw et al., 1992; Islam, 1995; Hall and Jones, 1999). Lagged logarithm of average labor productivity ($\ln P_{i,t-k}$) controls for the fact that productivity may have more room to grow when initial average productivity is low. The other control variables, in vector $\mathbf{X}_{i,t}$, are the investment share of GDP (more capital helps increase labor productivity), years of schooling (a more educated labor force facilitates the adoption of new technologies), and trade openness (greater exposure to foreign competition forces firms to become more productive).

The use of annual data to study the determinants of labor productivity growth and of its within and structural change components may not be appropriate, as annual growth rates could be affected by short term shocks which could bias the results. Thus, following the common practice in the empirical growth literature, we use consecutive and non-overlapping 5-year periods (that is, $k = 5$).[7] Thus, the dependent variable is the average annual growth rate of labor productivity from $t − 5$ to $t$, and the explanatory variables in vectors $\mathbf{X}_{i,t}$ and $\mathbf{I}_{i,t}$ are averaged over each 5-year period. The descriptive statistics for the baseline samples of 5-year periods are presented in Tables A.4 and A.5 in Appendix A. In robustness checks, we also work with 10-year and 3-year periods.

We estimate the model of Eq. (3) by Fixed Effects (FE) and System Generalized Method of Moments (System-GMM). Although the number of cross-sections is not high (at most 82 countries), it is still considerably higher than the number of time periods available. Thus, FE estimations are likely to suffer from dynamic panel bias (Nickell, 1981), as the lagged dependent variable is correlated with the mean of the error term. Arellano and Bond (1991) developed a Difference-GMM estimator for linear dynamic panel data models that avoids this problem by taking first differences of the baseline equation and instrumenting the lags of the

---

[7] For the first dataset, based on ISIC Rev. 3.1, the initial year is 1950 and the periods are: 1951–55, 1956–60, ..., 2001–05, and 2006–07. For the second dataset, based on ISIC Rev. 4, the initial year is 1990 and the periods are: 1991–95, 1996–2000, 2011–15, and 2016–18. Since the sample periods are not exact multiples of 5, the last period of each database is shorter than 5 years.

first-differenced dependent variable with series constructed to correspond to the "initial conditions" that the level of the dependent variable in one period is uncorrelated with the error terms in later periods. (The same approach can be applied to other explanatory variables suspected of endogeneity.) A statistical problem of the Difference-GMM estimator is that lagged levels of the dependent variable are weak instruments for the first differences if the series are persistent over time. Therefore, we use the alternative System-GMM estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998), which augments the difference estimator by combining the regression in differences with the regression in levels in a system where the two equations are separately instrumented. This System-GMM estimator has been widely used in growth regressions since the seminal paper of Levine et al. (2000).[8]

Although we treat all explanatory variables as endogenous in our System-GMM estimations, this method is not a final solution to potential endogeneity problems. In fact, Bellemare et al. (2017) show that lagging explanatory variables may not be a correct way of dealing with endogeneity, as it sometimes leads to larger biases than ignoring endogeneity. They report that GMM estimation fares better in their Monte Carlo tests than fixed effects with lagged explanatory variables, but there is still some bias.[9] Wang and Bellemare (2020) analyze the use of lagged explanatory variables as instruments. They show that when lagged IVs violate the independence assumption, but not the exclusion assumption, the lagged IV method mitigates endogeneity. The exclusion assumption is not violated if the lagged explanatory variable does not affect the dependent variable directly, but only through the serial correlation of the explanatory variable. We believe that it is reasonable to assume that democracy and the other institutional variables respect the exclusion assumption.[10] Therefore, although our System-GMM estimations are not a final solution to potential endogeneity problems, it is reasonable to assume that they mitigate those problems.

### 4.2. Regressions for components of productivity growth

The second part of the empirical analysis tests our three hypotheses, analyzing the economic, institutional and political determinants of the within and structural change components of labor productivity growth. That is, we estimate models in which those components are the dependent variables. The empirical models can be presented as follows:

$$W_{i,t} = \mathbf{C}'_{W,i,t}\delta + \mathbf{Z}'_{W,i,t}\lambda + \mu_i + \eta_t + \epsilon_{i,t} \tag{4}$$

$$SC_{i,t} = \mathbf{C}'_{SC,i,t}\nu + \mathbf{Z}'_{SC,i,t}\rho + \mu_i + \eta_t + \epsilon_{i,t} \tag{5}$$

where $W_{i,t}$ and $SC_{i,t}$ are, respectively, the within and the structural change components of labor productivity growth, $\mathbf{C}_{W,i,t}$ and $\mathbf{C}_{SC,i,t}$ are vectors of control variables, and $\mathbf{Z}_{W,i,t}$ and $\mathbf{Z}_{SC,i,t}$ are vectors of other economic, institutional and political variables which may affect the within and/or the structural change components.

Regarding the control variables, $\mathbf{C}_{W,i,t}$ will include four variables: lagged logarithm of average labor productivity (as within sector productivity may have more room to grow when initial average productivity is low); investment share of GDP (as more capital helps increase labor productivity); years of schooling (since a more educated labor force facilitates the adoption of new technologies); and trade openness (as greater exposure to foreign competition forces firms to become more productive). We also experimented adding other control variables, but doing so considerably reduced the sample size, or tended to produce statistically insignificant coefficients. Those additional controls included the share of bank non-performing loans, a real exchange rate index, variables related to technology and innovation (High-technology exports, ICT exports and Patent applications), additional indicators of financial development/efficiency, the share of raw materials in total exports, foreign direct investment flows, and a rigidity of employment index.

In $\mathbf{C}_{SC,i,t}$ we will include three control variables. First, the lagged share of employment in the agricultural sector, which may be seen as a proxy for initial structural gaps (McMillan et al., 2014), and may increase the potential for structural-change induced growth. Second, the investment share of GDP. Third, the lagged (initial) average years of schooling of the population above 15 years old. As in the case of the within-sector component, other variables were tried, but were seldom or never statistically significant when included. That was the case of *Trade (% GDP)*, *Rigidity of Employment Index* (Word Bank), of indicators of financial development, of the share of raw materials in total exports, and of a real effective exchange rate index.

Given the static nature of these panel data models, they are estimated by Fixed Effects, with standard errors clustered by country and robust to heteroskedasticity. As in the models for labor productivity growth, consecutive and non-overlapping 5-year periods are used (see footnote 7).

---

[8] Even though the System-GMM estimator is theoretically the most appropriate for the estimation of our growth models, its results can vary significantly with the instruments chosen when the sample size is relatively small. Thus, it is advisable to compare its results with those of FE estimations, whose signs and pattern of statistical significance tend to be correct.

[9] Bellemare et al. (2017) illustrate the trade-offs that arise when researchers do not have access to a perfect research design, which is also our case, as finding a natural experiment to test our hypotheses is practically impossible. Researchers face the question of whether it is better to ignore endogeneity or to use lagged explanatory variables. Since the results of our System-GMM estimations are mostly consistent with those of FE, BCLS and BCFE regressions, which do not use lagged explanatory variables to deal with endogeneity, it seems that, in our setting, it does not make much difference to use lags or not. This is somewhat reassuring, as it is indicative that our results are robust.

[10] When lags of the institutional variables are included alongside their contemporaneous values in estimations only the latter are statistically significant.

**Table 4**
Labor productivity growth - Data based on ISIC Rev. 4 (1990–2018).

| VARIABLES | (1) FE | (2) Sys-GMM | (3) FE | (4) Sys-GMM | (5) FE | (6) Sys-GMM |
|---|---|---|---|---|---|---|
| L. Log(Labor Productivity) | −0.0491*** | −0.00596 | −0.0618*** | −0.0160*** | −0.0607*** | −0.0154*** |
|  | (−5.015) | (−1.459) | (−5.958) | (−2.739) | (−5.684) | (−2.811) |
| Investment (%GDP) | 0.133*** | 0.105 | 0.0766* | 0.0565 | 0.0804** | 0.103** |
|  | (3.484) | (1.214) | (1.908) | (1.069) | (1.994) | (2.123) |
| L. Years of schooling | −0.00137 | −0.00261 | −0.00130 | −0.000987 | −0.00175 | 0.00153 |
|  | (−0.536) | (−1.223) | (−0.595) | (−0.455) | (−0.755) | (0.584) |
| Population growth rate | 0.294 | −1.724*** | 0.179 | −1.850*** | −0.860* | −1.487*** |
|  | (0.561) | (−4.363) | (0.467) | (−4.502) | (−1.870) | (−4.107) |
| Trade (% GDP) | −0.0176** | −0.00399 | −0.0171** | −0.00908 | −0.0134 | −0.0117* |
|  | (−2.070) | (−0.663) | (−2.014) | (−1.054) | (−1.547) | (−1.776) |
| Autocracy-Democracy | 0.000247 | −0.00165 | −0.000381 | −0.00229** | −0.000234 | −0.00140 |
|  | (0.416) | (−1.547) | (−0.595) | (−2.484) | (−0.384) | (−1.655) |
| Economic Freedom |  |  | 0.0198*** | 0.0217** | 0.0162*** | 0.00949 |
|  |  |  | (4.103) | (2.202) | (3.196) | (0.993) |
| Government Stability |  |  |  |  | 0.00257** | 0.00357 |
|  |  |  |  |  | (2.122) | (1.156) |
| Observations | 432 | 432 | 420 | 420 | 393 | 393 |
| Number of countries | 77 | 77 | 77 | 77 | 71 | 71 |
| Adj. R-squared | 0.186 |  | 0.264 |  | 0.262 |  |
| Instruments |  | 52 |  | 60 |  | 68 |
| Hansen, p-value |  | 0.110 |  | 0.593 |  | 0.567 |
| AR1, p-value |  | 0.00869 |  | 0.00400 |  | 0.00290 |
| AR2, p-value |  | 0.0781 |  | 0.112 |  | 0.0716 |

Notes: Fixed effects and System-GMM regressions, including 5-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table 5**
Within effect.

| VARIABLES | (1) Dataset 1 - ISIC Rev. 3.1 (1950–2007) | (2) | (3) | (4) Dataset 2 - ISIC Rev. 4 (1990–2018) | (5) | (6) |
|---|---|---|---|---|---|---|
| L. Log(Labor Productivity) | −0.0205** | −0.0289*** | −0.0397*** | −0.0446*** | −0.0565*** | −0.0553*** |
|  | (−2.388) | (−3.408) | (−2.875) | (−4.251) | (−5.083) | (−4.701) |
| Investment (%GDP) | 0.0853** | 0.0218 | −0.0150 | 0.0868* | 0.0386 | 0.0286 |
|  | (2.579) | (0.677) | (−0.447) | (1.863) | (0.826) | (0.601) |
| L. Years of schooling | −0.000220 | −0.00191 | −0.00325 | −0.00151 | −0.00118 | −0.00109 |
|  | (−0.128) | (−1.089) | (−1.260) | (−0.535) | (−0.470) | (−0.404) |
| Trade (% GDP) | 0.00867 | 0.0118 | 0.0295*** | −0.00977 | −0.00955 | −0.00804 |
|  | (1.147) | (1.576) | (4.561) | (−1.086) | (−1.067) | (−0.881) |
| Autocracy-Democracy | −0.000406 | −0.000579** | 8.16e−05 | 0.000114 | −0.000326 | −0.000387 |
|  | (−1.478) | (−2.039) | (0.207) | (0.194) | (−0.559) | (−0.618) |
| Economic Freedom |  | 0.0103*** | 0.0103*** |  | 0.0160*** | 0.0151*** |
|  |  | (5.554) | (3.616) |  | (3.480) | (2.892) |
| Government Stability |  |  | 0.00335*** |  |  | 0.00106 |
|  |  |  | (2.670) |  |  | (0.739) |
| Observations | 506 | 449 | 320 | 432 | 420 | 393 |
| Number of countries | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.171 | 0.239 | 0.359 | 0.104 | 0.169 | 0.159 |

Notes: Fixed Effects estimations, including 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

## 5. Empirical results

This section presents the results of labor productivity growth regressions and of the estimation of models for the within and structural change components of labor productivity growth. Following the discussion presented in Section 2, the objective is to test whether democracy, economic freedom and political stability have positive effects on productivity growth and on its within-sector and structural change components.

It is worth noting that our results do not prove causality. Creating a research design that would allow us to effectively address causality would require finding a natural experiment in the context of productivity growth in a panel of countries, which is practically impossible. Thus, our results and conclusions, based on conditional correlations, should be interpreted as indicative.

**Table 6**
Within effect - Alternative proxies of democracy and (in)stability.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Dataset 1 - ISIC Rev. 3.1 (1980–2007) | | | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
| Autocracy-Democracy | | | 3.77e−05 | −0.000529* | −0.000631** | | | −0.000312 |
| | | | (0.0862) | (−1.804) | (−2.223) | | | (−0.480) |
| Checks and Balances | 0.00119 | | | | | −0.000640 | | |
| | (1.026) | | | | | (−0.356) | | |
| Regimes of the World (0–9) | | 0.000996 | | | | | −0.00204 | |
| | | (1.001) | | | | | (−1.068) | |
| Economic Freedom | 0.00943*** | 0.0103*** | 0.0107*** | 0.00979*** | 0.00977*** | 0.0146*** | 0.0150*** | 0.0150*** |
| | (3.129) | (3.287) | (3.193) | (4.916) | (5.315) | (2.958) | (2.966) | (3.336) |
| Government Stability | 0.00347*** | 0.00300** | | | | 0.00112 | 0.00115 | |
| | (2.797) | (2.500) | | | | (0.743) | (0.790) | |
| External Conflict (lack of thereof) | | | 0.00190** | | | | | |
| | | | (2.031) | | | | | |
| General Strikes | | | | −0.00522** | | | | |
| | | | | (−2.004) | | | | |
| Anti-Government Demonstrations | | | | | −0.00179** | | | |
| | | | | | (−2.636) | | | |
| Government Crises | | | | | | | | −0.0162*** |
| | | | | | | | | (−3.492) |
| Observations | 326 | 333 | 320 | 449 | 449 | 395 | 402 | 348 |
| Number of countries | 62 | 63 | 60 | 61 | 61 | 72 | 73 | 77 |
| Adj. R-squared | 0.361 | 0.348 | 0.338 | 0.244 | 0.254 | 0.157 | 0.165 | 0.229 |

Notes: Fixed Effects estimations, including 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table 7**
Within effect - Economic Freedom - ISIC Rev. 3.1 (1980–2007).

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Autocracy-Democracy index | −0.000279 | 0.000172 | −0.000113 | −0.000486 | 0.000256 | 0.000103 | −0.000184 | 0.000381 | 0.000220 | 0.000405 | −0.00108 | 0.000164 | −0.000590 |
| | (−0.626) | (0.422) | (−0.286) | (−1.054) | (0.678) | (0.236) | (−0.438) | (1.002) | (0.550) | (1.153) | (−0.891) | (0.405) | (−0.588) |
| Area1 - Government Size | 0.000625 | 0.00337* | | | | | | | | | | | |
| | (0.300) | (1.703) | | | | | | | | | | | |
| Area2 - Legal system & prop. rights | 0.00800*** | | 0.00922*** | | | | | | | | | | |
| | (3.509) | | (4.618) | | | | | | | | | | |
| A2A Judicial independence | | | | 0.00966*** | | | | | | | | | |
| | | | | (3.302) | | | | | | | | | |
| A2C Protection of property rights | | | | | 0.00699** | | | | | | | | |
| | | | | | (2.271) | | | | | | | | |
| A2E Integrity of the legal system | | | | | | 0.00406* | | | | | | | |
| | | | | | | (1.763) | | | | | | | |
| A2G Regulatory restrictions on the sale of real assets | | | | | | | 0.00823* | | | | | | |
| | | | | | | | (1.741) | | | | | | |
| Area3 - Access to sound money | 0.000311 | | | | | | | 0.00189** | | | | | |
| | (0.291) | | | | | | | (2.282) | | | | | |
| Area4 - Freedom to trade | 0.00320* | | | | | | | | 0.00459** | | | | |
| | (1.682) | | | | | | | | (2.417) | | | | |
| A4A Tariffs | | | | | | | | | | 0.00478*** | | | |
| | | | | | | | | | | (3.402) | | | |
| A4Bi Nontariff trade barriers | | | | | | | | | | | 0.00550** | | |
| | | | | | | | | | | | (2.432) | | |
| Area5 - Regulation | 0.00492 | | | | | | | | | | | 0.00706* | |
| | (1.279) | | | | | | | | | | | (1.830) | |
| A5C Business regulations | | | | | | | | | | | | | 0.00519* |
| | | | | | | | | | | | | | (1.848) |
| Government Stability | 0.00281** | 0.00399** | 0.00359** | 0.00390** | 0.00389** | 0.00366** | 0.00319 | 0.00388** | 0.00311** | 0.00287** | 0.00188 | 0.00362*** | 0.00223 |
| | (2.614) | (2.635) | (2.328) | (2.536) | (2.551) | (2.363) | (1.639) | (2.605) | (2.653) | (2.239) | (1.270) | (2.908) | (1.395) |
| Observations | 320 | 320 | 320 | 320 | 320 | 320 | 272 | 320 | 320 | 320 | 207 | 320 | 214 |
| Number of countries | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| Adj. R-squared | 0.376 | 0.317 | 0.336 | 0.328 | 0.322 | 0.320 | 0.279 | 0.321 | 0.345 | 0.364 | 0.346 | 0.339 | 0.320 |

Notes: Fixed Effects estimations, including control variables and 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

## 5.1. Labor productivity growth

Labor productivity growth regressions—Eq. (3)—are reported in Table 3 (where the dataset based on ISIC Rev. 3.1 is used—recall Section 3.1) and Table 4 (using the ISIC Rev. 4 dataset). In order to test our three hypotheses, the *Autocracy–Democracy* index (from Polity5) is added to the control variables in the estimations of columns 1 and 2, the *Economic Freedom* index (from EFW) is also considered in columns 3 and 4, and *Government Stability* (from ICRG) is added in columns 5 and 6.[11] The results shown in columns 1 and 2 of Tables 3 and 4, where the *Autocracy–Democracy* index is the only institutional variable considered, and where the number

---

[11] Although the sample based on ISIC Rev. 3.1 covers 64 countries, the *Autocracy-Democracy* index is not available for Iceland, Hong Kong and Malta, bringing the number of countries to 61 in columns 1 and 2 of Table 3. The number of observations drops in the following columns because data on the *Economic Freedom* index and on *Government Stability* only become available in the 1970s and 1980s, respectively (the initial year for each estimation is indicated at the foot of

**Table 8**

Within effect - Economic Freedom - ISIC Rev. 4 (1990–2018).

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Autocracy-Democracy | −0.000364 | 8.11e−05 | 8.83e−05 | −0.000339 | 7.66e−05 | −6.09e−05 | −0.000376 | −0.000370 | 0.000180 | 0.000132 | −0.000397 |
| | (−0.667) | (0.117) | (0.148) | (−0.452) | (0.140) | (−0.0947) | (−0.570) | (−0.513) | (0.294) | (0.164) | (−0.465) |
| Area1 - Size of government | 0.00400 | 0.00461 | | | | | | | | | |
| | (1.208) | (1.375) | | | | | | | | | |
| Area2 - Legal system & property rights | 0.00421 | | 0.00592 | | | | | | | | |
| | (0.961) | | (1.413) | | | | | | | | |
| A2A Judicial independence | | | | 0.00903* | | | | | | | |
| | | | | (1.903) | | | | | | | |
| Area3 - Access to sound money | 0.00417* | | | | 0.00394 | | | | | | |
| | (1.821) | | | | (1.660) | | | | | | |
| Area4 - Freedom to trade | 0.00492* | | | | | 0.00682** | | | | | |
| | (1.752) | | | | | (2.417) | | | | | |
| A4A Tariffs | | | | | | | 0.00655*** | | | | |
| | | | | | | | (3.048) | | | | |
| A4Bi Nontariff trade barriers | | | | | | | | 0.00769*** | | | |
| | | | | | | | | (4.060) | | | |
| Area5 - Regulation | −0.00478 | | | | | | | | −9.33e−05 | | |
| | (−0.960) | | | | | | | | (−0.0207) | | |
| A5Cv Licensing restrictions | | | | | | | | | | 0.00475** | |
| | | | | | | | | | | (2.007) | |
| A5Cvi Tax compliance | | | | | | | | | | | 0.00369** |
| | | | | | | | | | | | (2.253) |
| Government Stability | 0.000789 | 0.00149 | 0.00222 | 0.00227 | 0.00145 | 0.00131 | 0.00125 | 0.000516 | 0.00190 | 0.00166 | 0.000729 |
| | (0.523) | (0.951) | (1.453) | (1.527) | (1.009) | (0.918) | (0.880) | (0.332) | (1.193) | (1.015) | (0.447) |
| Observations | 391 | 395 | 396 | 396 | 392 | 393 | 393 | 356 | 394 | 276 | 341 |
| Number of countries | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 71 | 71 |
| Adj. R-squared | 0.181 | 0.145 | 0.125 | 0.133 | 0.144 | 0.145 | 0.175 | 0.176 | 0.121 | 0.202 | 0.162 |

Notes: Fixed Effects estimations, including control variables and 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

of observations is highest, suggest that the political regime does not affect productivity growth; the *Autocracy–Democracy* index is not statistically significant in these estimations. When the other institutional variables are also included (columns 3–6), there is some indication (mainly in Table 3) that democracy may have a small negative effect on productivity growth. Overall, it is clear that Hypothesis 1, that democracy has positive effects on labor productivity growth, is not supported by the results shown in Tables 3 and 4.[12]

The index of *Economic Freedom* is positive and statistically significant in the estimations of columns 3, 4 and 5 of Tables 3 and 4, providing support for Hypothesis 2, that economic freedom has positive effects on labor productivity growth. This result is consistent with previous literature that found positive effects of economic freedom on productivity and GDP growth (Barro, 1996; de Haan et al., 2006; Aisen and Veiga, 2013). Finally, *Government Stability* also seems to have a positive effect on labor productivity (see columns 5 and 6), providing support for Hypothesis 3. This is consistent with the results of several studies showing negative effects of political instability on economic growth (Alesina et al., 1996; Jong-A-Pin, 2009; Aisen and Veiga, 2013).

According to the modernization hypothesis (Lipset, 1959), the level of economic development drives the creation and consolidation of democracy. Since productivity growth is related to income and economic development, if the latter cause democracy, there could be a problem of reverse causality with respect to the *Autocracy-Democracy* index. Eventually, the same issue could emerge in relation to the other institutional variables. Although this is a theoretical possibility, we believe it is not a major problem in the context of our analysis. First, our dependent variable is the rate of labor productivity growth over a 5-year period, and periods of high productivity growth may occur in low income developing countries that, according to the modernization hypothesis, would not be prone to adopt democracy.[13] Second, Acemoglu et al. (2009) find no evidence of a significant causal effect of income on democracy. They argue that omitted variables and historical factors appear to have shaped the divergent political and economic development paths of various societies, leading to the positive association between economic performance and democracy.[14] Finally, according to North (1990), it is hardly controversial that institutions affect the performance of economies, and that the differential performance of economies over time is fundamentally influenced by the way institutions evolve. Based on North (1990), Acemoglu et al. (2005), Acemoglu and Robinson (2012), and on most of the empirical literature on institutions and economic growth, we believe that the direction of causality goes from institutions to economic performance.

Regarding the control variables, the results are generally consistent with conditional beta productivity convergence, with positive effects of the investment share of GDP, with negative effects of population growth, and with positive effects of openness to trade. All these results are in line with the previous literature. Surprisingly, the initial average years of schooling of the population has a negative coefficient in two of the estimations reported in Table 3 and is not statistically significant in the remaining estimations.

---

Table 3). Reduced country coverage explains the drop in the number of countries covered in Table 4 relative to the 83 in the database based on ISIC Rev. 4. The initial year is 1990 for all estimations reported in Table 4.

[12] The results obtained are similar when the *Regimes of the World* index (V-dem) is used instead of *Autocracy-Democracy* index (variable *polity2* of Polity5) – see Table B.6 in Appendix B. Using *Checks and Balances* (from DPI) as a proxy of democracy also leads to similar results (not shown).

[13] It is worth noting that the correlation between labor productivity growth and GDP per capita in our samples is just 5.75% when using ISIC 3.1 and 7.9% when using ISIC 4.0. Thus, the possibility that income levels cause democracy does not necessarily imply that the rate of productivity growth over a 5-year period also causes democracy.

[14] Acemoglu and Robinson (2019) describe several cases in which countries that were in similar income levels exhibited different paths with respect to the "narrow corridor". Those cases provide additional evidence against the modernization hypothesis and in favor of the "critical junctures" hypothesis.

The Fixed Effects and System-GMM results presented in Tables 3 and 4 are similar, but not exactly coincident. However, as remarked in footnote 8, the results of System-GMM estimations in small samples such as ours should be interpreted with caution. Therefore, we proceed by checking the robustness of our results to the use of two alternative dynamic panel data methods: the Bias-Corrected Least Squares Dummy Variables (Bruno, 2005); and the Bootstrap-Corrected Dynamic Fixed Effects (de Vos et al., 2015). The results, presented in Table B.7 in Appendix B, are very similar to those of the fixed effects estimations of Tables 3 and 4, reinforcing our conclusion that there is no empirical support for Hypothesis 1, while there is robust support for Hypotheses 2 and 3.

In order to check if the effects of the institutional variables depend on the level of development, we interacted them with a dummy variable that takes the value of one for advanced and of zero for emerging economies (see the country lists in Tables A.1 and A.2). The results reported in Table B.8 in Appendix B are very similar to those of Tables 3 and 4 and do not suggest a clear distinction of the effects of institutional variables for advanced or emerging economies.

### 5.2. Determinants of the within-sector productivity component

In this subsection we move the focus to the impact of the political regime, economic freedom and political stability on within-sector productivity growth—Eq. (4). The estimates are reported in Table 5.

The *Autocracy-Democracy index* (Polity5) is generally not statistically significant, except in column 2 where it has a negative coefficient. Thus, regarding the within component, there is no support for Hypothesis 1. Since the *Economic Freedom* index (EFW) is always positive and statistically significant, the results clearly suggest that economic freedom has a positive effect on within sector productivity growth, thus supporting Hypothesis 2. Finally, *Government Stability* (ICRG) is positive and statistically significant in column 3, but not in column 6. Thus, we only find support for Hypothesis 3 when using the first dataset, based on ISIC Rev. 3.1. This may be due to a smaller prevalence of extreme cases of political instability in more recent years than in the 20th century, when coups and revolutions were more frequent.[15] The results reported in Table 5 suggest that, for within productivity growth, as for labor productivity growth in general, the essential freedom is economic rather than political. This is closer to the conclusions of Barro (1996) and Aisen and Veiga (2013) than to those of Aghion et al. (2008) and Acemoglu et al. (2019).

Several alternative proxies of democracy/autocracy and political stability were used in the estimations shown in Table 6. In each estimation, one of the institutional variables was replaced by a suitable alternative. As reported in columns 1–2 and 6–7, the results regarding democracy remain essentially the same when replacing the *Autocracy–Democracy* index (Polity5), with *Checks and Balances* (DPI) or with the *Regimes of the World (0–9)* index (V-dem). Other proxies of democracy — *Executive Constraints* (Polity5), *Regimes of the World (0–3)* index (V-dem), *Democratic Accountability* (ICRG), and *Military in Politics* (ICRG) — are also statistically insignificant when included (the results are available upon request). In sum, there is no support for Hypothesis 1 regardless of the variable that is used to proxy democracy/autocracy.

Three alternative indicators of political (in)stability were used instead of *Government Stability* in columns 3–5 of Table 6. Consistent with Hypothesis 3, *External Conflict (lack of thereof)*, from ICRG, has positive effects, while more frequent *General Strikes* (CNTS) and *Anti-Government Demonstrations* (CNTS) have negative effects on within-sector productivity growth. The results are weaker for Dataset 2, for which *Government Stability* and the above-referred to alternative proxies are not statistically significant (results for the latter are not shown). In fact, we only find support for Hypothesis 3 when using the average number of *Government Crises* (CNTS) as a proxy of political instability (column 8). In sum, there is robust support of Hypothesis 3 when using Dataset 1 (based on ISIC Rev. 3.1), but very weak support when using Dataset 2 (based on ISIC Rev. 4), which covers more recent years. As indicated above, this may be due to a lower incidence of extreme cases of political instability in recent years.

Next we analyze the effects of economic freedom in greater detail. Starting with Dataset 1, we include the five areas of the *Economic Freedom* index (EFW), simultaneously in column 1 of Table 7. Then, in the following columns, we include the five areas and some of their components, individually. All main five areas seem to have positive effects on the within component when included individually (see columns 2, 3, 8, 9, and 12), but only *Area2 - Legal system & security of property rights* and *Area4 - Freedom to trade* are statistically significant when the five areas are included simultaneously.

Regarding the components of Area 2, judicial independence, protection of property rights, integrity of the legal system, and smaller regulatory restrictions on the sale of real assets[16] seem to contribute to higher rates of within-sector labor productivity growth. Tariff and non-tariff barriers seem to be the most relevant components of Area4 (Freedom to trade), while business regulations are the only statistically significant component of Area 5 (Regulation).[17] The significance of those proxies of *Economic Freedom*, namely, the protection of property rights and regulatory restrictions, suggest that an institutional setting that favors free entry and business dynamism play an important role in enhancing productivity growth.

The results reported in Table 8 are somewhat weaker, as of the five main areas only *Area3 - Access to sound money* and *Area4 - Freedom to trade* are statistically significant when the five main areas are included simultaneously, and only *Area4 - Freedom to trade* is significant when included individually. The results for the components are more similar to those shown in Table 7, as they

---

[15] As done for labor productivity growth, we checked if the effects of the institutional variables depend on the level of development, by interacting them with a dummy variable for advanced economies. The results reported in Table B.9 in Appendix B are similar to those of Table 5 and do not suggest a robust distinction of the effects of institutional variables for advanced or emerging economies.

[16] Note that higher values of the Economic Freedom of the World variables imply greater freedom or smaller restrictions/barriers and more flexible regulation.

[17] The components related to credit and labor market regulations are not statistically significant when included.

**Table 9**
Structural Change effect.

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | Dataset 1 - ISIC Rev. 3.1 (1950–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
| L.Agriculture (%Employment) | 0.0746*** | 0.0857*** | 0.0925*** | 0.109*** | 0.110*** | 0.106*** |
| | (4.571) | (4.509) | (3.527) | (5.426) | (5.477) | (5.180) |
| Investment (%GDP) | 0.0335 | 0.0490*** | 0.0227 | 0.0603*** | 0.0450*** | 0.0448*** |
| | (1.444) | (2.908) | (0.995) | (4.073) | (3.253) | (3.444) |
| L. Years of schooling | 0.000914 | 0.00109 | 0.000435 | 0.000355 | −0.000192 | −0.000336 |
| | (0.692) | (0.839) | (0.342) | (0.360) | (−0.213) | (−0.386) |
| Autocracy-Democracy | 0.000224 | 0.000291 | 0.000171 | 0.000190 | 4.24e−05 | 0.000118 |
| | (0.963) | (1.205) | (0.764) | (0.789) | (0.151) | (0.472) |
| Economic Freedom | | −0.00171 | −0.000601 | | 0.00450* | 0.00235 |
| | | (−0.786) | (−0.302) | | (1.724) | (1.344) |
| Government Stability | | | 0.00159** | | | 0.00146** |
| | | | (2.280) | | | (2.361) |
| Observations | 506 | 449 | 320 | 432 | 420 | 393 |
| Number of countries | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.153 | 0.181 | 0.148 | 0.164 | 0.176 | 0.204 |

Notes: Fixed Effects estimations, including 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the structural change component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

again suggest the importance of judicial independence, lower tariff and non-tariff trade barriers, and business regulations (related to licensing and tax compliance) for within-sector labor productivity growth.

Overall, the results reported in Tables 7 and 8 reinforce the support for Hypothesis 2 already found in Table 6, clearly showing that economic freedom, and several of its areas, contribute to higher rates of labor productivity growth through their positive effects on the within-sector component.

Although it is arguable that freedom to trade is compatible with an autocratic regime, it is more debatable that *Judicial independence* or *Protection of property rights* are compatible with non-democratic regimes. Therefore, the econometric results for those indicators of *Economic Freedom* suggest that the relation between the political regime and productivity growth needs further investigation.

### 5.3. Determinants of the structural change productivity component

Table 9 reports the results of estimations of Eq. (5) for the determinants of the structural change component of labor productivity growth. Three variables are included as controls in all estimations. First, the lagged share of employment in the agricultural sector, which may be seen as a proxy for initial structural gaps (McMillan et al., 2014), and may increase the potential for structural-change induced growth. Second, the investment share of GDP, as labor re-allocations may be easier under higher investment levels. Third, the lagged (initial) average years of schooling of the population above 15 years old, as more educated workers tend to have greater flexibility to move to different sectors. While the share of agriculture in employment is always statistically significant, and the investment share of GDP is significant in most estimations, the years of schooling are surprisingly always insignificant.[18]

Regarding the institutional dimension, the political regime variable, *Autocracy-Democracy*, is never statistically significant and the variable *Economic Freedom* is only marginally significant in column 5. Thus, there is no indication that autocracy/democracy has positive effects on structural change, and very weak evidence for a positive effect of economic freedom. On the contrary, *Government Stability* is positive and statistically significant for both datasets (columns 3 and 6). In sum, the results reported in Table 9 provide strong support for Hypothesis 3, but not for Hypotheses 1 and 2.[19]

Table 10 reports the results obtained when using several alternative proxies of democracy and (in)stability. Regarding democracy, there is some indication that more *Checks and Balances* (DPI) may foster structural change (column 1), but this result is only obtained for Dataset 1. The *Regimes of the World (0–9)* index (V-dem) is never statistically significant, and the same applies to the *Autocracy-Democracy* index. As for the index of *Economic Freedom*, it is only marginally statistically significant in column 9 and insignificant in all other estimations. Thus, there is no support for Hypothesis 2. Finally, *Government Stability* is always positive and statistically

---

[18] Other economic variables were tried, but were seldom or never statistically significant when included. That was the case of *Trade (% GDP)*, *Rigidity of Employment Index* (Word Bank), of indicators of financial development, and of the share of raw materials in total exports. The real effective exchange rate index is statistically significant, with a negative sign, when included in the estimations of columns 1 to 3, indicating that overvaluation hinders structural change. Due to many missing values, the inclusion of this variable leads to a considerable drop in the number of observations. Additionally, it is not statistically significant when included in the estimations of columns 4 to 6. For these reasons, we prefer not to include it in the set of control variables. All these results are available upon request.

[19] Again, we checked if the effects of the institutional variables depend on the level of development. The results reported in Table B.10 in Appendix B do not suggest a robust distinction of the effects of institutional variables for advanced or emerging economies. Although there is a surprising indication that *Economic Freedom* has a negative effect in advanced economies, this only happens for Dataset 1. *Government Stability* also becomes insignificant for Dataset 1.

**Table 10**

Structural Change effect - Alternative proxies of democracy and (in)stability.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Dataset 1 - ISIC Rev. 3.1 (1970–2007) | | | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | | | |
| Autocracy-Democracy | | | 0.000115 | 0.000291 | −0.000106 | | | 3.29e−06 | 0.000283 | 0.000479 |
| | | | (0.514) | (1.214) | (−0.222) | | | (0.0127) | (0.851) | (1.416) |
| Checks and Balances | 0.00128** | | | | | 0.000510 | | | | |
| | (2.111) | | | | | (0.965) | | | | |
| Regimes of the World (0-9) | | −0.000387 | | | | | 0.000661 | | | |
| | | (−0.630) | | | | | (1.152) | | | |
| Economic Freedom | 3.50e−06 | 0.000225 | 0.000110 | −0.00163 | −0.0101 | 0.00239 | 0.00252 | 0.00244 | 0.00479* | −0.00166 |
| | (0.00208) | (0.110) | (0.0597) | (−0.769) | (−1.663) | (1.443) | (1.418) | (1.451) | (1.687) | (−0.951) |
| Government Stability | 0.00130** | 0.00134* | | | | 0.00153** | 0.00144** | | | |
| | (2.130) | (1.842) | | | | (2.433) | (2.312) | | | |
| Ethnic Tensions | | | 0.00233** | | | | | 0.00249*** | | |
| | | | (2.240) | | | | | (3.068) | | |
| Government Crises | | | | 0.00235 | | | | | −0.00638*** | |
| | | | | (0.970) | | | | | (−2.668) | |
| Political Stability and Absence of Violence/Terrorism | | | | | 0.00810** | | | | | 0.00575** |
| | | | | | (2.086) | | | | | (2.379) |
| Observations | 326 | 333 | 320 | 449 | 179 | 395 | 402 | 393 | 348 | 370 |
| Number of ifs | 62 | 63 | 60 | 61 | 61 | 72 | 73 | 71 | 77 | 77 |
| Adj. R-squared | 0.146 | 0.131 | 0.142 | 0.182 | 0.150 | 0.207 | 0.199 | 0.206 | 0.156 | 0.192 |

Notes: Fixed Effects estimations, including 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the structural change component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table 11**

Structural Change effect - Economic Freedom.

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| | Dataset 1 - ISIC Rev. 3.1 (1970–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | | | | |
| Autocracy-Democracy | 0.000198 | 0.000932** | 0.000222 | 0.000208 | 0.000195 | 6.50e−05 | 0.000215 | 0.000153 | 0.000709* |
| | (0.874) | (2.229) | (0.869) | (0.785) | (0.839) | (0.271) | (0.940) | (0.651) | (1.962) |
| Area1 - Size of government | 0.000748 | | | −0.000689 | | | | | |
| | (0.775) | | | (−0.613) | | | | | |
| Area2 - Legal system & prop. rights | −0.00170 | | | −0.00108 | | | | | |
| | (−1.256) | | | (−0.621) | | | | | |
| A2C Protection of property rights | | | | | 0.00317** | | | | |
| | | | | | (2.470) | | | | |
| Area3 - Access to sound money | −0.000149 | | | 0.000156 | | | | | |
| | (−0.281) | | | (0.211) | | | | | |
| Area4 - Freedom to trade | −0.000414 | | | 0.00263 | | | | | |
| | (−0.474) | | | (1.532) | | | | | |
| A4A Tariffs | | | | | | 0.00164* | | | |
| | | | | | | (1.982) | | | |
| A4Bi Nontariff trade barriers | | | | | | | 0.00203** | | |
| | | | | | | | (2.471) | | |
| A4Diii Freedom of foreigners to travel | | 0.153** | | | | | | | |
| | | (2.381) | | | | | | | |
| Area5 - Regulation | 0.000206 | | | −0.000306 | | | | | |
| | (0.145) | | | (−0.209) | | | | | |
| A5A Credit market regulations | | | | | | | | 0.00129* | |
| | | | | | | | | (1.876) | |
| A5Aii Private sector credit | | | 0.00106** | | | | | | |
| | | | (2.068) | | | | | | |
| A5Ci Administrative requirements | | | | | | | | | 0.00161** |
| | | | | | | | | | (2.002) |
| Government Stability | 0.00169** | 0.000682 | 0.00142** | 0.00143** | 0.00114* | 0.00143** | 0.000828 | 0.00135** | 0.00106* |
| | (2.379) | (0.550) | (2.224) | (2.199) | (1.857) | (2.390) | (1.560) | (2.200) | (1.792) |
| Observations | 320 | | | 391 | 396 | 393 | 356 | 392 | 327 |
| Number of ifs | 60 | | | 71 | 71 | 71 | 71 | 71 | 71 |
| Adj. R-squared | 0.143 | | | 0.206 | 0.203 | 0.216 | 0.259 | 0.210 | 0.248 |

Notes: Fixed Effects estimations, including 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the structural change component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

significant, and there is also indication that lack of *Ethnic Tensions* (ICRG), smaller frequency of *Government Crises*, and greater *Political Stability and Absence of Violence/Terrorism* (WGI) favors structural change.

The estimations whose results are shown in Table 11 analyze the effects of economic freedom on the structural change productivity component in greater detail. Consistent with the insignificance of the index of *Economic Freedom* in Tables 9 and

**Table A.1**

List of countries - Dataset 1 (based on ISIC Rev. 3.1, 1950–2007).

| Advanced Economies (23) | Emerging/Developing Economies (41) | |
|---|---|---|
| | *Africa (10)* | *Asia (10)* |
| Australia (1970–2007) | Botswana (1964–2010) | China (1952–2010) |
| Austria (1970–2007) | Ghana (1960–2011) | Hong Kong (1974–2011) |
| Belgium (1970–2007) | Kenya (1969–2011) | India (1960–2010) |
| Canada (1970–2008) | Malawi (1966–2010) | Indonesia (1961–2012) |
| Denmark (1950–2009) | Mauritius (1970–2011) | Korea (1963–2010) |
| Finland (1970–2007) | Morocco (1960–2012) | Malaysia (1975–2011) |
| France (1950–2009) | Senegal (1970–2010) | Philippines (1971–2012) |
| Germany (1970–2007) | South Africa (1960–20011) | Singapore (1970–2011) |
| Greece (1970–2007) | Tanzania (1960–2011) | Taiwan (1963–2012) |
| Iceland (1990–2008) | Zambia (1965–2010) | Thailand (1960–2011) |
| Ireland (1970–2007) | | |
| Italy (1951–2009) | | |
| Japan(1953–2011) | *Latin America (9)* | *Eastern Europe (8)* |
| Luxembourg (1970–2007) | Argentina (1950–2011) | Czech Republic (1995–2007) |
| Netherlands (1960–2009) | Bolivia (1950–2010) | Estonia (1995–2007) |
| New Zealand (1989–2008) | Brazil (1950–2011) | Hungary (1992–2007) |
| Norway (1970–2009) | Chile (1950–2011) | Latvia (1995–2007) |
| Portugal (1970–2006) | Colombia (1950–2010) | Lithuania (1995–2007) |
| Spain (1950–2009) | Costa Rica (1950–2011) | Poland (1995–2006) |
| Sweden (1950–2009) | Mexico (1950–2011) | Slovakia (1995–2007) |
| Switzerland (1990–2008) | Peru (1960–2011) | Slovenia (1995–2006) |
| United Kingdom (1950–2009) | Venezuela (1950–2011) | |
| United States (1950–2010) | | *Middle East (4)* |
| | | Cyprus (1995–2007) |
| | | Egypt (1960–2012) |
| | | Israel (2000–2008) |
| | | Malta (1995–2007) |

**Table A.2**

List of countries - Dataset 2 (based on ISIC Rev. 4, 1990–2018).

| Advanced Economies (23) | Emerging/Developing Economies (60) | |
|---|---|---|
| | *Africa (20)* | *Asia (18)* |
| Australia (1990–2018) | Botswana (1990–2018) | Bangladesh (1990–2018) |
| Austria (1990–2018) | Burkina Faso (1990–2018) | Cambodia (1990–2018) |
| Belgium (1995–2018) | Cameroon (1990–2018) | China (1990–2018) |
| Canada (1997–2016) | Ethiopia (1990–2018) | China, Hong Kong (1990–2018) |
| Denmark (1990–2018) | Ghana (1990–2018) | India (1990–2018) |
| Finland (1990–2018) | Kenya (1990–2018) | Indonesia (1990–2018) |
| France (1990–2018) | Lesotho (1990–2018) | Lao People's DR (1990–2018) |
| Germany (1991–2018) | Malawi (1990–2018) | Malaysia (1990–2018) |
| Greece (1995–2015) | Mauritius (1990–2018) | Myanmar (1990–2018) |
| Iceland (1997–2015) | Morocco (1990–2018) | Nepal (1990–2018) |
| Ireland (1998–2015) | Mozambique (1990–2018) | Pakistan (1990–2018) |
| Italy (1992–2018) | Namibia (1990–2018) | Philippines (1990–2018) |
| Japan (1990–2018) | Nigeria (1990–2018) | Republic of Korea (1990–2018) |
| Luxembourg (1995–2018) | Rwanda (1990–2018) | Singapore (1990–2018) |
| Netherlands (1990–2018) | Senegal (1990–2018) | Sri Lanka (1990–2018) |
| New Zealand (1990–2018) | South Africa (1990–2018) | Taiwan (1990–2018) |
| Norway (1990–2018) | Tanzania (1990–2018) | Thailand (1990–2018) |
| Portugal (1995–2018) | Tunisia (1990–2018) | Viet Nam (1990–2018) |
| Spain (1995–2018) | Uganda (1990–2018) | |
| Sweden (1993–2015) | Zambia (1990–2018) | *Eastern Europe (8)* |
| Switzerland (1995–2018) | | Czech Republic (1993–2018) |
| United Kingdom (1995–2018) | *Latin America (10)* | Estonia (1995–2018) |
| United States (1998–2018) | Argentina (1990–2018) | Hungary (1995–2018) |
| | Bolivia (1990–2018) | Latvia (1995–2018) |
| | Brazil (1990–2018) | Lithuania (1995–2018) |
| | Chile (1990–2018) | Poland (1995–2018) |
| | Colombia (1990–2018) | Slovakia (1995–2018) |
| | Costa Rica (1990–2018) | Slovenia (1995–2018) |
| | Ecuador (1990–2018) | |
| | Mexico (1990–2018) | *Middle East (4)* |
| | Peru (1990–2018) | Cyprus (1995–2015) |
| | Venezuela (1990–2018) | Egypt (1990–2018) |
| | | Israel (1990–2018) |
| | | Turkey (1990–2018) |

**Table A.3**

Growth rates and shares of value added by sector (Dataset 2 - ISIC Rev. 4).

*Source:* Economic Transformations Database and EU KLEMS (GGDC) and STAN (OECD), all based on ISIC Rev. 4.

| Sector | Average of the Annual Growth Rates of Value Added (1990–2018) | | Average Sector Shares of Value Added | | | |
| | Advanced Economies | Emerging Economies | Advanced Economies | | Emerging Economies | |
| | | | 1990 | 2018 | 1990 | 2018 |
|---|---|---|---|---|---|---|
| Agriculture | 1.48 | 2.92 | 2.30 | 1.60 | 20.58 | 11.67 |
| Mining | 3.45 | 5.33 | 3.44 | 1.78 | 5.65 | 4.14 |
| Manufacturing | 2.32 | 4.97 | 14.33 | 14.03 | 14.91 | 15.92 |
| Utilities | 2.40 | 5.24 | 3.33 | 2.57 | 2.39 | 2.56 |
| Construction | 1.74 | 6.02 | 8.01 | 5.69 | 5.31 | 6.43 |
| Trade services | 2.87 | 5.31 | 12.59 | 14.19 | 13.80 | 15.84 |
| Transport services | 3.44 | 5.78 | 5.16 | 4.93 | 4.81 | 6.02 |
| Business services | 5.34 | 8.08 | 9.44 | 14.76 | 4.59 | 9.17 |
| Financial services | 3.34 | 7.92 | 5.06 | 6.89 | 3.43 | 5.30 |
| Real estate | 3.46 | 5.51 | 10.75 | 11.57 | 7.10 | 6.27 |
| Government services | 2.38 | 4.73 | 22.02 | 18.95 | 13.80 | 13.32 |
| Other services | 3.32 | 5.05 | 3.58 | 3.04 | 3.64 | 3.35 |
| Total Economy | 2.62 | 4.63 | | | | |
| Obs./Countries | 718 | 1633 | 11 | 18 | 51 | 58 |

**Table A.4**

Descriptive Statistics of Dataset 1 (Based on ISIC Rev. 3.1, 1950–2007).

| Variables | (1) Observ. | (2) Mean | (3) St.Dev. | (4) Min. | (5) Max. |
|---|---|---|---|---|---|
| Growth rate of labor productivity | 519 | 0.02 | 0.03 | −0.05 | 0.16 |
| Within effect of labor productivity growth | 519 | 0.02 | 0.03 | −0.06 | 0.15 |
| Structural change effect on labor productivity growth | 519 | 0.01 | 0.01 | −0.06 | 0.08 |
| Employment share of Agriculture | 519 | 0.26 | 0.24 | 0.00 | 0.92 |
| PWT10 - Average share of gross capital formation in GDP | 519 | 0.24 | 0.09 | 0.03 | 0.63 |
| PWT10 - Population average annual growth rate | 519 | 0.01 | 0.01 | −0.01 | 0.05 |
| PWT10 - Average share of trade in GDP | 519 | 0.56 | 0.59 | 0.02 | 5.08 |
| Barro&Lee - Average years of total schooling, age 15+, total | 458 | 7.00 | 2.86 | 0.71 | 12.86 |
| Barro&Lee - Advanced economies | 519 | 0.38 | 0.49 | 0.00 | 1.00 |
| Polity5 - Autocracy-Democracy index (−10 to 10) | 505 | 4.92 | 6.53 | −9.00 | 10.00 |
| DPI - Checks and Balances | 416 | 3.39 | 1.73 | 1.00 | 17.00 |
| V-dem - Regimes of the World (0-9) | 519 | 5.77 | 3.15 | 0.00 | 9.00 |
| EFW - Economic Freedom of the World index | 463 | 6.61 | 1.30 | 2.81 | 9.06 |
| Area1 - Government Size | 465 | 6.18 | 1.21 | 2.69 | 9.46 |
| Area2 - Legal system & security of property rights | 467 | 6.01 | 1.60 | 2.28 | 8.47 |
| A2A - Judicial independence | 467 | 5.54 | 1.55 | 1.53 | 8.00 |
| A2C - Protection of property rights | 467 | 5.85 | 1.07 | 2.34 | 7.89 |
| A2E - Integrity of the legal system | 467 | 6.71 | 1.66 | 2.25 | 8.93 |
| A2G - Regulatory restrictions on the sale of real assets | 289 | 7.29 | 1.76 | 1.03 | 9.93 |
| Area3 - Access to sound money | 467 | 7.59 | 2.10 | 0.00 | 9.84 |
| Area4 - Freedom to trade | 460 | 6.92 | 2.11 | 0.00 | 9.97 |
| A4A - Tariffs | 460 | 7.06 | 2.24 | 0.00 | 10.00 |
| A4Bi - Nontariff trade barriers | 220 | 6.79 | 1.47 | 3.33 | 9.69 |
| A4Diii - Freedom of foreigners to travel | 125 | 5.85 | 2.50 | 0.10 | 10.00 |
| Area5 - Regulation | 463 | 6.34 | 1.36 | 1.58 | 9.43 |
| A5A - Credit market regulations | 463 | 7.62 | 2.15 | 0.00 | 10.00 |
| A5Aii - Private sector credit | 444 | 8.14 | 1.74 | 0.05 | 10.00 |
| A5C - Business regulations | 227 | 6.78 | 1.37 | 2.90 | 9.54 |
| A5Ci - Administrative requirements | 177 | 4.75 | 1.93 | 0.96 | 8.54 |
| A5Cv - Licensing restrictions | 122 | 7.39 | 1.78 | 0.90 | 9.98 |
| A5Cvi - Tax compliance | 182 | 6.61 | 2.47 | 0.00 | 9.45 |
| ICRG - Government Stability | 333 | 7.90 | 1.74 | 2.50 | 11.00 |
| ICRG - External Conflict | 333 | 10.31 | 1.56 | 4.58 | 12.00 |
| ICRG - Ethnic Tensions | 333 | 4.34 | 1.29 | 0.62 | 6.00 |
| CNTS - Anti-Government Demonstrations | 509 | 0.85 | 1.92 | 0.00 | 25.60 |
| CNTS - General Strikes | 509 | 0.18 | 0.43 | 0.00 | 4.20 |
| CNTS - Government Crises | 509 | 0.22 | 0.39 | 0.00 | 3.20 |
| WGI - Political stability and absence of violence/terrorism | 188 | 0.40 | 0.88 | −2.16 | 1.66 |

11, none of the five main areas is statistically significant when all are included simultaneously (columns 1 and 4). The same is true when they are included individually (results not shown). Despite these results, we undertake a deeper analysis, checking the

**Table A.5**

Descriptive Statistics of Dataset 2 (Based on ISIC Rev. 4, 1990–2018).

| Variables | (1) Observ. | (2) Mean | (3) St.Dev. | (4) Min. | (5) Max. |
|---|---|---|---|---|---|
| Growth rate of labor productivity | 368 | 0.03 | 0.03 | −0.05 | 0.16 |
| Within effect of labor productivity growth | 368 | 0.02 | 0.03 | −0.05 | 0.16 |
| Structural change of labor productivity growth | 368 | 0.00 | 0.01 | −0.07 | 0.07 |
| Employment Share of Agriculture | 368 | 0.27 | 0.25 | 0.00 | 0.95 |
| PWT10 - Average share of gross capital formation in GDP | 368 | 0.23 | 0.07 | 0.05 | 0.59 |
| PWT10 - Population average annual growth rate | 368 | 0.01 | 0.01 | −0.04 | 0.06 |
| PWT10 - Average share of trade in GDP | 368 | 0.65 | 0.65 | 0.07 | 5.08 |
| Barro&Lee - Average years of total schooling, age 15+, total | 368 | 8.39 | 2.89 | 0.93 | 15.49 |
| Barro&Lee - Advanced economies | 368 | 0.26 | 0.44 | 0.00 | 1.00 |
| Polity5 - Autocracy-Democracy index (−10 to 10) | 360 | 5.68 | 5.48 | −7.20 | 10.00 |
| DPI - Checks and Balances | 363 | 3.35 | 1.57 | 1.00 | 14.40 |
| V-dem - Regimes of the World (0-9) | 368 | 5.97 | 2.95 | 0.00 | 9.00 |
| EFW - Economic Freedom Index | 356 | 6.97 | 1.01 | 2.80 | 9.06 |
| Area1 - Government size | 366 | 6.52 | 1.18 | 0.79 | 9.15 |
| Area2 - Legal system & security of property rights | 368 | 5.85 | 1.52 | 2.63 | 8.47 |
| A2A - Judicial independence | 368 | 5.38 | 1.50 | 1.90 | 8.00 |
| A2C - Protection of property right | 368 | 5.63 | 1.07 | 3.28 | 7.89 |
| A2E - Integrity of the legal syste | 368 | 6.70 | 1.42 | 3.45 | 8.93 |
| A2G - Regulatory restrictions on t | 365 | 7.14 | 1.84 | 1.03 | 9.94 |
| Area3 - Access to sound money | 355 | 8.15 | 1.65 | 0.00 | 9.84 |
| Area4 - Freedom to trade | 355 | 7.29 | 1.48 | 0.00 | 9.73 |
| A4A - Tariffs | 356 | 7.26 | 1.75 | 0.00 | 10.00 |
| A4Bi - Nontariff trade barriers | 313 | 6.32 | 1.39 | 3.11 | 9.69 |
| A4Diii - Freedom of foreigners to travel | 234 | 5.81 | 2.89 | 0.00 | 10.00 |
| Area5 - Regulation | 357 | 6.89 | 1.11 | 3.13 | 9.40 |
| A5A - Credit market regulations | 356 | 8.21 | 1.57 | 0.61 | 10.00 |
| A5Aii - Private sector credit | 358 | 8.35 | 1.68 | 0.05 | 10.00 |
| A5C - Business regulations | 330 | 6.70 | 1.34 | 2.88 | 9.54 |
| A5Ci - Administrative requirements | 283 | 4.45 | 1.70 | 1.43 | 8.54 |
| A5Cv - Licensing restrictions | 231 | 7.50 | 1.73 | 0.90 | 9.99 |
| A5Cvi - Tax compliance | 300 | 6.69 | 2.30 | 0.00 | 9.45 |
| ICRG - Government Stability | 338 | 8.10 | 1.48 | 4.43 | 11.00 |
| ICRG - Ethnic Tensions | 338 | 4.10 | 1.25 | 1.00 | 6.00 |
| ICRG - External Conflict | 338 | 10.27 | 1.20 | 5.60 | 12.00 |
| CNTS - Anti-Government Demonstrations | 363 | 1.10 | 3.35 | 0.00 | 41.00 |
| CNTS - General Strikes | 363 | 0.19 | 0.59 | 0.00 | 6.67 |
| CNTS - Government Crises | 363 | 0.14 | 0.27 | 0.00 | 1.40 |
| WGI - Political stability and absence of violence/terrorism | 312 | 0.16 | 0.93 | −2.59 | 1.66 |

eventual effects of components and sub-components of the five main areas of economic freedom. For Dataset 1, only the *Freedom of foreigners to travel* and regulations regarding *Private sector credit* seem to promote structural change. When using Dataset 2, we obtain results that are more similar to those obtained for the within effect, indicating that greater *Protection of property rights*, lower *Tariffs* and *Nontariff trade barriers*, more flexible *Credit market regulations*, and less *Administrative requirements* for businesses may promote structural change. Although the results presented in Table 11 do not provide robust support for Hypothesis 3, they indicate that some specific components of economic freedom may help foster the movement of workers from less to more productive sectors.

Overall, the empirical results for the structural change component of labor productivity growth provide little or no evidence of a positive effect of democracy/autocracy (Hypothesis 1). Although the support for Hypothesis 2 is weak, there is some indication that specific components of economic freedom may have positive effects on the structural change component of labor productivity growth. On the contrary, there is clear evidence that political instability has adverse effects (Hypothesis 3).

### 5.4. Robustness checks

In this section, we briefly discuss the results of a series of estimations undertaken to check the robustness of the results presented above to the use of periods of different lengths.[20]

The results of the estimation of the labor productivity growth model of Eq. (3), using panel datasets with 10-year periods are reported in Table C.11 in Appendix C. They are similar to those shown in Table 3, although the evidence regarding positive effects of *Government Stability* is somewhat weaker for Dataset 2. Table C.12 reports the results for the within and structural change components of productivity growth when 10-year period datasets are used. These results are similar to those shown in Tables 5

---

[20] The results of robustness checks which were already referred to are presented in Appendix B.

**Table B.6**
Labor productivity growth - *Regimes of the World* (V-dem) as proxy for democracy.

| | (1) FE | (2) Sys-GMM | (3) FE | (4) Sys-GMM | (5) FE | (6) Sys-GMM |
|---|---|---|---|---|---|---|
| *Dataset 1 - Based on ISIC Rev. 3.1 (1950–2007)* | | | | | | |
| Regimes of the World (0-9) | −0.00128 | −0.000774 | −0.00126 | 0.000177 | 0.000226 | −0.00200 |
| | (−1.094) | (−0.394) | (−1.301) | (0.0893) | (0.234) | (−0.873) |
| Economic Freedom | | | 0.00943*** | 0.0108 | 0.00979*** | 0.00692 |
| | | | (4.176) | (1.543) | (2.893) | (0.950) |
| Government Stability | | | | | 0.00365*** | 0.00361 |
| | | | | | (2.953) | (1.193) |
| Observations | 519 | 519 | 463 | 463 | 333 | 333 |
| Number of countries | 64 | 64 | 64 | 64 | 63 | 63 |
| Adj. R-squared | 0.257 | | 0.319 | | 0.397 | |
| Instruments | | 60 | | 51 | | 53 |
| Hansen, p-value | | 0.0881 | | 0.166 | | 0.154 |
| AR1, p-value | | 0.00158 | | 0.00243 | | 0.0224 |
| AR2, p-value | | 0.590 | | 0.747 | | 0.882 |
| *Dataset 2 - Based on ISIC Rev. 4 (1990–2018)* | | | | | | |
| Regimes of the World (0-9) | −0.000622 | −0.00369* | −0.00136 | −0.00360** | −0.00121 | −0.00323** |
| | (−0.427) | (−1.688) | (−0.796) | (−2.508) | (−0.715) | (−2.338) |
| Economic Freedom | | | 0.0195*** | 0.0190** | 0.0159*** | 0.0124 |
| | | | (4.082) | (2.206) | (3.220) | (1.355) |
| Government Stability | | | | | 0.00275** | 0.00471 |
| | | | | | (2.235) | (1.641) |
| Observations | 441 | 441 | 429 | 429 | 402 | 402 |
| Number of countries | 79 | 79 | 79 | 79 | 73 | 73 |
| Adj. R-squared | 0.186 | | 0.262 | | 0.267 | |
| Instruments | | 52 | | 60 | | 68 |
| Hansen, p-value | | 0.0993 | | 0.263 | | 0.287 |
| AR1, p-value | | 0.0151 | | 0.00583 | | 0.00262 |
| AR2, p-value | | 0.0487 | | 0.0708 | | 0.0592 |

Notes: Fixed effects and System-GMM regressions, including 5-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table B.7**
Labor productivity growth - Alternative dynamic panel data methods.

| | (1) BC-LSDV | (2) BCFE | (3) BC-LSDV | (4) BCFE | (5) BC-LSDV | (6) BCFE |
|---|---|---|---|---|---|---|
| *Dataset 1 - Based on ISIC Rev. 3.1 (1950–2007)* | | | | | | |
| Autocracy-Democracy | −0.00134 | −0.00334* | −0.00250* | −0.00412* | 0.00130 | 0.000982 |
| | (−0.980) | (−1.653) | (−1.820) | (−1.934) | (0.686) | (0.294) |
| Economic Freedom | | | 0.0406*** | 0.0547*** | 0.0438*** | 0.0386** |
| | | | (4.573) | (4.763) | (4.569) | (2.534) |
| Government Stability | | | | | 0.0197*** | 0.0184*** |
| | | | | | (4.412) | (2.718) |
| Observations | 505 | 505 | 449 | 449 | 320 | 320 |
| Number of countries | 61 | 61 | 61 | 61 | 60 | 60 |
| *Dataset 2 - Based on ISIC Rev. 4 (1990–2018)* | | | | | | |
| Autocracy-Democracy | .0003685 | 0.000499 | −.000114 | −0.000544 | .0000446 | −0.000422 |
| | (.0005) | (0.675) | (.0005) | (−0.636) | (.0005) | (−0.499) |
| Economic Freedom | | | .0034412*** | 0.0262*** | .0033275*** | 0.0216*** |
| | | | (4.14) | (4.536) | (3.26) | (3.988) |
| Government Stability | | | | | .0012591** | 0.00296* |
| | | | | | (1.98) | (1.957) |
| Observations | 432 | 432 | 420 | 420 | 393 | 393 |
| Number of countries | 77 | 77 | 77 | 77 | 71 | 71 |

Notes: Bias-corrected Least Squares Dummy Variables (BC-LSDV) and Bootstrap-Corrected dynamic Fixed Effects (BCFE) regressions, including control variables and 5-year period dummies. BC-LSDV bootstrapped standard errors, with bias correction initialized by Blundell and Bond estimator, and with a variance–covariance matrix calculated using 250 repetitions. BCFE with confidence bounds for the t-distribution calculated with bootstrapped standard errors and inference performed with non-parametric bootstrap using 250 iterations. The dependent variable is the average annual growth rate of labor productivity, over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table B.8**

Labor productivity growth - Interaction with dummy for Advanced Economies.

|  | (1) FE | (2) Sys-GMM | (3) FE | (4) Sys-GMM | (5) FE | (6) Sys-GMM |
|---|---|---|---|---|---|---|
| *Dataset 1 - Based on ISIC Rev. 3.1 (1950–2007)* | | | | | | |
| Autocracy-Democracy | −0.000494 | −0.000714 | −0.000880* | −0.00191 | −0.000192 | −0.00237** |
|  | (−1.194) | (−0.716) | (−1.853) | (−1.246) | (−0.354) | (−2.135) |
| Autocracy-Democracy * Advanced Economies | −0.000593 | 3.17e−05 | 2.54e−05 | −0.000246 | −0.000296 | −0.00142 |
|  | (−0.648) | (0.00734) | (0.0236) | (−0.0658) | (−0.0718) | (−0.112) |
| Economic Freedom |  |  | 0.0101*** | 0.0175** | 0.0103*** | 0.0165** |
|  |  |  | (3.834) | (2.198) | (3.037) | (2.213) |
| Economic Freedom * Advanced Economies |  |  | −0.00376 | −0.0137 | −0.00399 | −0.0208* |
|  |  |  | (−0.803) | (−1.012) | (−0.947) | (−1.949) |
| Government Stability |  |  |  |  | 0.00379*** | 0.00571* |
|  |  |  |  |  | (2.820) | (1.936) |
| Government Stability * Advanced Economies |  |  |  |  | 0.000612 | 0.00357 |
|  |  |  |  |  | (0.483) | (0.810) |
| Observations | 505 | 505 | 449 | 449 | 320 | 320 |
| Number of countries | 61 | 61 | 61 | 61 | 60 | 60 |
| Adj. R-squared | 0.268 |  | 0.334 |  | 0.407 |  |
| Instruments |  | 61 |  | 52 |  | 54 |
| Hansen, p-value |  | 0.130 |  | 0.185 |  | 0.441 |
| AR1, p-value |  | 0.00245 |  | 0.00161 |  | 0.0163 |
| AR2, p-value |  | 0.376 |  | 0.360 |  | 0.711 |
| *Dataset 2 - Based on ISIC Rev. 4 (1990–2018)* | | | | | | |
| Autocracy-Democracy | 0.000189 | −0.000207 | −0.000394 | −0.000816 | −0.000244 | 0.00147 |
|  | (0.315) | (−0.157) | (−0.635) | (−0.620) | (−0.410) | (0.992) |
| Autocracy-Democracy * Advanced Economies | 0.00588* | 0.0121 | 0.00122 | 0.0147 | 0.000787 | 0.0203 |
|  | (1.947) | (0.551) | (0.501) | (0.503) | (0.365) | (0.725) |
| Economic Freedom |  |  | 0.0175*** | 0.00611 | 0.0142*** | −0.00749 |
|  |  |  | (3.736) | (0.469) | (2.858) | (−0.647) |
| Economic Freedom * Advanced Economies |  |  | 0.0438** | 0.0397 | 0.0398** | 0.0316 |
|  |  |  | (2.151) | (0.812) | (2.282) | (0.670) |
| Government Stability |  |  |  |  | 0.00250* | 0.00418 |
|  |  |  |  |  | (1.748) | (0.987) |
| Government Stability * Advanced Economies |  |  |  |  | 9.16e−05 | −0.00576 |
|  |  |  |  |  | (0.0456) | (−0.667) |
| Observations | 432 | 432 | 420 | 420 | 393 | 393 |
| Number of countries | 77 | 77 | 77 | 77 | 71 | 71 |
| Adj. R-squared | 0.186 |  | 0.273 |  | 0.268 |  |
| Instruments |  | 36 |  | 41 |  | 46 |
| Hansen, p-value |  | 0.754 |  | 0.784 |  | 0.959 |
| AR1, p-value |  | 0.0128 |  | 0.00839 |  | 0.0395 |
| AR2, p-value |  | 0.0514 |  | 0.147 |  | 0.0831 |

Notes: Fixed effects and System-GMM regressions, including control variables and 5-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

and 9, indicating that democracy does not matter for productivity growth, that the positive effects of economic freedom operate through within sector gains, and that government stability affects productivity growth through both of its components (with more robust results for structural change).

Appendix D shows the results obtained when using 3-year periods. Again, the results for labor productivity growth D.13 and for its components (Table D.14) are similar to those obtained when using 5-year periods (Tables 3, 5 and 9).

Overall, our results are robust to the use of periods of longer or shorter lengths,[21] and our conclusions regarding the support for the three hypothesis remain the same.

## 6. Conclusion

This paper revisits the question of the role played by institutions and political stability in the process of productivity growth and economic development. We contribute to this discussion by distinguishing between two sources of productivity growth: within sector and structural change. These two components have different natures and their contribution to labor productivity growth varies across countries, time, and stages of economic development. The within component is the major source of productivity growth in

---

[21] Although we believe that it is not appropriate to study the determinants of labor productivity growth and its components using annual data, we nevertheless used it in robustness checks. The results, available upon request, are similar to those obtained for longer periods.

**Table B.9**

Within effect - Interaction with dummy for Advanced Economies.

| | Dataset 1 - ISIC Rev. 3.1 (1950–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Autocracy-Democracy | −0.000211 | −0.000501 | −2.46e−05 | 4.30e−05 | −0.000350 | −0.000415 |
| | (−0.759) | (−1.478) | (−0.0544) | (0.0727) | (−0.622) | (−0.686) |
| Autocracy-Democracy * Advanced Economies | −0.00129*** | −0.00116** | 0.00234 | 0.00722*** | 0.00285 | 0.00278 |
| | (−3.523) | (−2.029) | (0.467) | (2.810) | (1.208) | (1.145) |
| Economic Freedom | | 0.0113*** | 0.0108*** | | 0.0137*** | 0.0126** |
| | | (4.939) | (3.391) | | (2.990) | (2.397) |
| Economic Freedom * Advanced Economies | | −0.00389 | −0.00462 | | 0.0477** | 0.0459** |
| | | (−0.852) | (−0.880) | | (2.171) | (2.049) |
| Government Stability | | | 0.00318** | | | 0.000848 |
| | | | (2.447) | | | (0.512) |
| Government Stability * Advanced Economies | | | −0.000281 | | | 0.000617 |
| | | | (−0.235) | | | (0.271) |
| Observations | 506 | 449 | 320 | 432 | 420 | 393 |
| Number of ifs | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.175 | 0.247 | 0.356 | 0.105 | 0.180 | 0.169 |

Notes: Fixed Effects estimations, including control variables and 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table B.10**

Structural Change - Interaction with dummy for Advanced Economies.

| | Dataset 1 - ISIC Rev. 3.1 (1950–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Autocracy-Democracy | 0.000213 | 6.93e−05 | 8.55e−05 | 0.000169 | 3.13e−05 | 0.000115 |
| | (0.899) | (0.266) | (0.366) | (0.695) | (0.111) | (0.452) |
| Autocracy-Democracy * Advanced Economies | 7.85e−05 | 0.00103 | 0.00328** | 0.00206 | 0.00134 | 0.00117 |
| | (0.134) | (1.527) | (2.160) | (1.237) | (0.891) | (0.739) |
| Economic Freedom | | −0.00104 | −0.000162 | | 0.00439 | 0.00206 |
| | | (−0.494) | (−0.0772) | | (1.566) | (1.138) |
| Economic Freedom * Advanced Economies | | −0.00457*** | −0.00389** | | 0.000592 | 0.00493 |
| | | (−3.617) | (−2.071) | | (0.0863) | (0.768) |
| Government Stability | | | 0.00128 | | | 0.00150** |
| | | | (1.476) | | | (2.101) |
| Government Stability * Advanced Economies | | | 0.000228 | | | −0.000206 |
| | | | (0.301) | | | (−0.297) |
| Observations | 506 | 449 | 320 | 432 | 420 | 393 |
| Number of ifs | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.151 | 0.194 | 0.148 | 0.163 | 0.172 | 0.198 |

Notes: Fixed Effects estimations, including control variables and 5-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within component of annual labor productivity growth over a 5-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

both emerging and advanced economies. Since the 1990s, the structural change component has contributed very little to productivity growth in advanced economies, and its importance in emerging economies has also declined. In fact, in advanced economies, the structural change component gave a negative contribution to productivity growth after the international financial crisis.

To address the issue of the effect of institutions and political instability on within-sector and structural change productivity growth, we estimated econometric models of productivity growth featuring institutional and political variables. We used the econometric models to test three hypotheses: (1) democracy has positive effects on within-sector and structural change productivity growth; (2) economic freedom promotes within-sector and structural change productivity growth; and (3) political stability fosters within-sector and structural change productivity growth.

Our main results are threefold. First, democracy (autocracy) has no robust impact, positive or negative, on either component of productivity growth. Second, political stability is positively associated with both components of productivity growth. Third, economic freedom seems to foster within-sector productivity growth, but has no robust effect on structural change.

A more detailed analysis of the economic freedom dimension suggests that the legal system and property rights, freedom to trade, and lower regulatory burden have positive effects on within-sector productivity growth. One possible interpretation of these results is that an institutional context that favors business dynamism, i.e., the intensity of reallocation of resources between firms, especially between incumbents and innovators, may be crucial for long-run productivity growth and economic development.

**Table C.11**

Labor productivity growth - Panels of 10-year periods.

| | (1) FE | (2) Sys-GMM | (3) BC-LSDV | (4) BCFE | (5) FE | (6) Sys-GMM | (7) BC-LSDV | (8) BCFE | (9) FE | (10) Sys-GMM | (11) BC-LSDV | (12) BCFE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Dataset 1 - Based on ISIC Rev. 3.1 (1950–2007)* | | | | | | | | | | | | |
| Autocracy-Democracy | −0.000900 | −0.000296 | −0.00465 | −0.0105* | −0.000992 | −0.00105 | −0.00599* | −0.0124** | −0.000375 | −0.00186 | −0.000681 | −0.00335 |
| | (−1.408) | (−0.356) | (−1.320) | (−1.754) | (−1.645) | (−0.942) | (−1.767) | (−2.180) | (−0.601) | (−0.819) | (−0.133) | (−0.388) |
| Economic Freedom | | | | | 0.00672*** | 0.00197 | 0.0608*** | 0.106*** | 0.0103*** | 0.00150 | 0.0957*** | 0.0663* |
| | | | | | (3.316) | (0.306) | (2.979) | (4.075) | (2.921) | (0.171) | (3.252) | (1.800) |
| Government Stability | | | | | | | | | 0.00532*** | 0.00222 | 0.0409*** | 0.0550*** |
| | | | | | | | | | (3.038) | (0.576) | (2.823) | (2.660) |
| Observations | 243 | 243 | 243 | 235 | 228 | 228 | 228 | 220 | 154 | 154 | 154 | 146 |
| Number of countries | 59 | 59 | 59 | 51 | 59 | 59 | 59 | 51 | 58 | 58 | 58 | 50 |
| Adj. R-squared | 0.449 | | | | 0.512 | | | | 0.569 | | | |
| Instruments | | 41 | | | | 39 | | | | 26 | | |
| Hansen, p-value | | 0.224 | | | | 0.0936 | | | | 0.136 | | |
| AR1, p-value | | 0.0147 | | | | 0.101 | | | | 0.0218 | | |
| AR2, p-value | | 0.947 | | | | 0.470 | | | | | | |
| *Dataset 2 - Based on ISIC Rev. 4 (1990–2018)* | | | | | | | | | | | | |
| Autocracy-Democracy | −0.000717 | −0.000834 | −0.000459 | −0.00450 | −0.00140 | −0.000694 | −0.00471 | −0.0178 | −0.00141 | 0.000941 | −0.00409 | −0.0164 |
| | (−0.888) | (−0.439) | (−0.0798) | (−0.513) | (−1.527) | (−0.198) | (−0.830) | (−1.541) | (−1.433) | (0.375) | (−0.698) | (−1.305) |
| Economic Freedom | | | | | 0.0165** | 0.0129 | 0.120*** | 0.295*** | 0.0151* | −0.0228 | 0.110** | 0.280*** |
| | | | | | (2.274) | (0.601) | (2.761) | (4.170) | (1.799) | (−1.019) | (2.550) | (3.366) |
| Government Stability | | | | | | | | | −0.000170 | 0.0100 | 0.00959 | 0.00427 |
| | | | | | | | | | (−0.0846) | (1.635) | (0.529) | (0.228) |
| Observations | 211 | 211 | 211 | 210 | 206 | 206 | 206 | 204 | 192 | 192 | 192 | 191 |
| Number of countries | 77 | 77 | 77 | 76 | 77 | 77 | 77 | 75 | 71 | 71 | 71 | 70 |
| Adj. R-squared | 0.392 | | | | 0.441 | | | | 0.439 | | | |
| Instruments | | 20 | | | | 23 | | | | 26 | | |
| Hansen, p-value | | 0.0843 | | | | 0.255 | | | | 0.688 | | |
| AR1, p-value | | 0.0825 | | | | 0.140 | | | | 0.0323 | | |

Notes: Fixed effects, System-GMM, BC-LSDV and BCFE regressions, including control variables and 5-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 10-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table C.12**

Within and Structural Change effects - Panels of 10-year periods.

| | Dataset 1 - ISIC Rev. 3.1 (1950–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Within Effect* | | | | | | |
| Autocracy-Democracy | −0.000625 | −0.000645 | 4.88e−05 | −0.000736 | −0.00142* | −0.00150 |
| | (−1.595) | (−1.476) | (0.0903) | (−0.968) | (−1.741) | (−1.652) |
| Economic Freedom | | 0.00770*** | 0.00850** | | 0.0150** | 0.0155** |
| | | (4.092) | (2.399) | | (2.206) | (2.004) |
| Government Stability | | | 0.00430* | | | −0.00153 |
| | | | (1.991) | | | (−0.608) |
| Observations | 244 | 228 | 154 | 211 | 206 | 192 |
| Number of countries | 59 | 59 | 58 | 77 | 77 | 71 |
| Adj. R-squared | 0.334 | 0.353 | 0.450 | 0.281 | 0.359 | 0.358 |
| *Structural Change Effect* | | | | | | |
| Autocracy-Democracy | 0.000307 | 0.000343 | 4.80e−05 | 4.85e−05 | 6.85e−05 | 0.000108 |
| | (1.142) | (1.340) | (0.163) | (0.183) | (0.245) | (0.388) |
| Economic Freedom | | −0.00290 | 9.75e−05 | | 0.00161 | 0.000950 |
| | | (−1.234) | (0.0402) | | (0.722) | (0.389) |
| Government Stability | | | 0.00212* | | | 0.00139* |
| | | | (1.791) | | | (1.771) |
| Observations | 244 | 228 | 154 | 211 | 206 | 192 |
| Number of countries | 59 | 59 | 58 | 77 | 77 | 71 |
| Adj. R-squared | 0.318 | 0.392 | 0.245 | 0.182 | 0.196 | 0.230 |

Notes: Fixed Effects estimations, including control variables and 10-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within effect or the structural change component of annual labor productivity growth over a 10-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

According to our results, a democratic regime appears not to yield any growth dividend, while economic freedom does seem to raise productivity growth, leading to the conclusion that, regarding productivity, the "essential freedom is economic rather than political". However, it must be stressed that democracy and economic freedom tend to be highly correlated. In our sample, countries where a low level of democracy is accompanied by a high level of economic freedom are clearly exceptions, the most prominent of which is Singapore. Moreover, it is quite uncommon that dimensions of economic freedom like *Judicial independence* or *Protection of property rights*, which are relevant for productivity growth and are associated with economic development, are maintained at high levels in non-democratic regimes. Therefore, it remains to be seen if economic freedom and economic development are sustainable in the long run in non-democratic countries.

**Table D.13**

Labor productivity growth - Panels of 3-year periods.

| | (1) FE | (2) Sys-GMM | (3) BC-LSDV | (4) BCFE | (5) FE | (6) Sys-GMM | (7) BC-LSDV | (8) BCFE | (9) FE | (10) Sys-GMM | (11) BC-LSDV | (12) BCFE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Dataset 1 - Based on ISIC Rev. 3.1 (1950–2007)* | | | | | | | | | | | | |
| Autocracy-Democracy | −0.000448 | −0.000923 | −0.000816 | −0.00157 | −0.000547 | −0.00138* | −0.00112 | −0.00178 | 0.000202 | −0.00200* | 0.000658 | 0.000957 |
| | (−1.287) | (−1.471) | (−1.033) | (−1.575) | (−1.499) | (−1.903) | (−1.312) | (−1.386) | (0.390) | (−1.934) | (0.538) | (0.413) |
| Economic Freedom | | | | | 0.00948*** | 0.0141* | 0.0260*** | 0.0321*** | 0.00812*** | 0.00471 | 0.0263*** | 0.0222** |
| | | | | | (4.753) | (1.688) | (5.102) | (4.885) | (3.052) | (0.847) | (3.647) | (2.067) |
| Government Stability | | | | | | | | | 0.00236* | 0.00373 | 0.00651** | 0.00907** |
| | | | | | | | | | (1.961) | (1.092) | (2.483) | (2.091) |
| Observations | 776 | 776 | 776 | 776 | 657 | 657 | 657 | 657 | 425 | 425 | 425 | 425 |
| Number of countries | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 61 | 60 | 60 | 60 | 60 |
| Adj. R-squared | 0.225 | | | | 0.268 | | | | 0.262 | | | |
| Instruments | | 55 | | | | 56 | | | | 56 | | |
| Hansen, p-value | | 0.149 | | | | 0.0692 | | | | 0.0268 | | |
| AR1, p-value | | 0.000322 | | | | 1.40e−05 | | | | 0.000272 | | |
| AR2, p-value | | 0.458 | | | | 0.481 | | | | 0.293 | | |
| *Dataset 2 - Based on ISIC Rev. 4 (1990–2018)* | | | | | | | | | | | | |
| Autocracy-Democracy | 0.000179 | 0.00173 | 0.000841 | 0.000595 | −0.000474 | −0.00187 | −0.000821 | −0.00243 | −0.000330 | 0.000244 | −0.000904 | −0.00188 |
| | (0.324) | (1.149) | (0.648) | (0.312) | (−0.867) | (−0.985) | (−0.590) | (−1.178) | (−0.631) | (0.168) | (−0.618) | (−0.855) |
| Economic Freedom | | | | | 0.0168*** | 0.0170 | 0.0348*** | 0.0680*** | 0.0134*** | −0.00121 | 0.0249** | 0.0541*** |
| | | | | | (3.649) | (1.388) | (3.922) | (4.102) | (3.001) | (−0.185) | (2.568) | (3.318) |
| Government Stability | | | | | | | | | 0.00344*** | 0.00449 | 0.00347 | 0.0121*** |
| | | | | | | | | | (2.867) | (1.356) | (1.338) | (2.858) |
| Observations | 645 | 645 | 645 | 645 | 621 | 621 | 621 | 621 | 584 | 584 | 584 | 584 |
| Number of countries | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 77 | 71 | 71 | 71 | 71 |
| Adj. R-squared | 0.144 | | | | 0.196 | | | | 0.224 | | | |
| Instruments | | 62 | | | | 64 | | | | 80 | | |
| Hansen, p-value | | 0.190 | | | | 0.213 | | | | 0.662 | | |
| AR1, p-value | | 0.0103 | | | | 0.0110 | | | | 0.0288 | | |
| AR2, p-value | | 0.00358 | | | | 0.000314 | | | | 0.00179 | | |

Notes: Fixed effects, System-GMM, BC-LSDV and BCFE regressions, including control variables and 3-year period dummies. FE estimations use standard errors clustered by country and robust to heteroskedasticity. All variables are treated as endogenous in System-GMM estimations. The dependent variable is the average annual growth rate of labor productivity, over a 3-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

**Table D.14**

Within and Structural Change effects - Panels of 3-year periods.

| | Dataset 1 - ISIC Rev. 3.1 (1950–2007) | | | Dataset 2 - ISIC Rev. 4 (1990–2018) | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| *Within Effect* | | | | | | |
| Autocracy-Democracy | −0.000435* | −0.000435 | 0.000386 | −0.000295 | −0.000857 | −0.000894 |
| | (−1.751) | (−1.554) | (0.982) | (−0.535) | (−1.552) | (−1.430) |
| Economic Freedom | | 0.00924*** | 0.00693*** | | 0.0147*** | 0.0142*** |
| | | (5.723) | (2.959) | | (3.331) | (2.914) |
| Government Stability | | | 0.00225* | | | 0.00135 |
| | | | (1.796) | | | (0.869) |
| Observations | 777 | 657 | 425 | 645 | 621 | 584 |
| Number of countries | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.134 | 0.183 | 0.202 | 0.0432 | 0.0712 | 0.0697 |
| *Structural Change Effect* | | | | | | |
| Autocracy-Democracy | 0.000321 | 0.000409* | 0.000273 | 0.000527 | 0.000536 | 0.000615 |
| | (1.434) | (1.721) | (1.262) | (1.410) | (1.270) | (1.275) |
| Economic Freedom | | −0.000746 | 0.000872 | | 0.00183 | 5.30e−06 |
| | | (−0.437) | (0.453) | | (0.873) | (0.00283) |
| Government Stability | | | 0.000590 | | | 0.00204** |
| | | | (1.098) | | | (2.190) |
| Observations | 777 | 657 | 425 | 645 | 621 | 584 |
| Number of countries | 61 | 61 | 60 | 77 | 77 | 71 |
| Adj. R-squared | 0.115 | 0.0958 | 0.119 | 0.0670 | 0.0655 | 0.0786 |

Notes: Fixed Effects estimations, including control variables and 3-year period dummies. Standard errors clustered by country and robust to heteroskedasticity. The dependent variable is the within effect or the structural change component of annual labor productivity growth over a 3-year period. T-statistics are in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Data availability

The data will be shared in Mendeley when the paper is accepted for publication. Replication files with data and codes were attached along with the other paper files.

## Acknowledgments

## Appendix A. Country lists and descriptive statistics

See Tables A.1–A.5.

## Appendix B. Robustness checks - Panel datasets of 5-year periods

See Tables B.6–B.10.

## Appendix C. Robustness checks - Panel datasets of 10-year periods

See Tables C.11 and C.12.

## Appendix D. Robustness checks - Panel datasets of 3-year periods

See Tables D.13 and D.14.

## Appendix E. Supplementary data

Supplementary material related to this article can be found online at https://doi.org/10.1016/j.ejpoleco.2022.102185.

## References

Acemoglu, D., Johnson, S., Robinson, J.A., 2005. Institutions as the fundamental cause of long-run growth. In: Aghion, P., Durlauf, S. (Eds.), Handbook Of Economic Growth. North Holland, Amsterdam, pp. 385–472.

Acemoglu, D., Johnson, S., Robinson, J.A., Yared, P., 2009. Reevaluating the modernization hypothesis. J. Monet. Econ. 56 (8), 1043–1058.

Acemoglu, D., Naidu, S., Restrepo, P., Robinson, J.A., 2019. Democracy does cause growth. J. Political Econ. 127 (1), 47–100.

Acemoglu, D., Robinson, J.A., 2012. Why Nations Fail: The Origins Of Power, Prosperity And Poverty. Crown, New York.

Acemoglu, D., Robinson, J.A., 2019. The Narrow Corridor: States, Societies, And The Fate Of Liberty. Penguin Press, New York.

Aghion, P., Alesina, A., Trebbi, F., 2008. Democracy, technology and growth. In: Institutions And Economic Performance. Harvard University Press, Cambridge, MA.

Aisen, A., Veiga, F.J., 2013. How does political instability affect economic growth? European J. Political Econ. 29, 151–157.

Alcántar-Toledo, J., Venieris, Y.P., 2014. Fiscal policy, growth, income distribution and sociopolitical instability. European J. Political Econ. 34, 315–331.

Alesina, A., Özler, S., Roubini, N., Swagel, P., 1996. Political instability and economic growth. J. Econ. Growth 1 (2), 189–211.

Andrews, D., Criscuolo, C., Gal, P.N., 2016. The best versus the rest: The global productivity slowdown, divergence across firms and the role of public policy. In: OECD Productivity Working Papers 5. OECD Publishing, URL https://ideas.repec.org/p/oec/ecoaac/5-en.html.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. Rev. Econ. Stud. 58, 277–297.

Arellano, M., Bover, O., 1995. Another look at the instrumental variable estimation of error-component models. J. Econom. 68, 29–51.

Atolia, M., Loungani, P., Marquis, M., Papageorgiou, C., 2020. Rethinking development policy: What remains of structural transformation? World Dev. 128, 104834.

Baldwin, R., 2016. The Great Convergence—Information Technology And The New Globalization. Harvard University Press, Cambridge, MA.

Banks, A.S., Wilson, K.A., 2019. Cross-national time-series data archive. Databanks International. Jerusalem, Israel; see https://www.cntsdata.com/.

Barro, R., 1996. Democracy and growth. J. Econ. Growth 1, 1–27.

Barro, R., Lee, J.-W., 2010. A new data set of educational attainment in the world, 1950–2010. J. Dev. Econ. 104, 184–198.

Baumol, W.J., 2012. The Cost Disease: Why Computers Get Cheaper And Health Care Doesn'T. Yale University Press.

Bellemare, M.F., Masaki, T., Pepinsky, T.B., 2017. Lagged explanatory variables and the estimation of causal effects. J. Polit. 79 (3), 949–963.

Blundell, R., Bond, S., 1998. Initial conditions and moment restrictions in dynamic panel data models. J. Econom. 87, 115–143.

Bruno, G.S.F., 2005. Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. Econom. Lett. 87, 361–366.

Chen, B., Feng, Y., 1996. Some political determinants of economic growth: Theory and empirical implications. European J. Political Econ. 12 (4), 609–627.

Ciccone, A., Papaioannou, E., 2007. Red tape and delayed entry. J. Eur. Econ. Assoc. 5 (2–3), 444–458.

Coppedge, M., Gerring, J., Knutsen, C.H., Lindberg, S.I., Teorell, J., Altman, D., Bernhard, M., Fish, M.S., Glynn, A., Hicken, A., Luhrmann, A., Marquardt, K.L., McMann, K., Paxton, P., Pemstein, D., Seim, B., Sigman, R., Skaaning, S.-E., Staton, J., Wilson, S., Cornell, A., Alizada, N., Gastaldi, L., Gjerløw, H., Hindle, G., Ilchenko, N., Maxwell, L., Mechkova, V., Medzihorsky, J., von Römer, J., Sundström, A., Tzelgov, E., ting Wang, Y., Wig, T., Ziblatt, D., 2020. V-Dem [Country–Year/Country–Date] Dataset v10. Varieties of Democracy (V-Dem) Project. http://dx.doi.org/10.23696/vdemds20.

Cruz, C., Keefer, P., Scartascini, C., 2018. Database of Political Institutions 2017. Inter-American Development Bank Research Department, Washington, DC.

de Haan, J., Lundstrom, S., Sturm, J., 2006. Market-oriented institutions and policies and economic growth: A critical survey. J. Econ. Surv. 20, 157–191.

de Haan, J., Sturm, J.-E., 2003. Does more democracy lead to greater economic freedom? New evidence for developing countries. European J. Political Econ. 19 (3), 547–563.

de Vos, I., Everaert, G., Ruyssen, I., 2015. Bootstrap-based bias correction and inference for dynamic panels with fixed effects. Stata J. 15 (4), 986–1018.

de Vries, G., Arfelt, L., Drees, D., Godemann, M., Hamilton, C., Jessen-Thiesen, B., Kaya, A.I., Kruse, H., Mensah, E., Woltjer, P., 2021. The economic transformation database (ETD): Content, sources, and methods. In: WIDER Technical Note 2/2021. http://dx.doi.org/10.35188/UNU-WIDER/WTN/2021-2.

de Vries, G., de Vries, K., Gouma, R., Pahl, S., Timmer, M., 2015. GGDC 10-sector database: Content, sources, and methods. Available at https://www.rug.nl/ggdc/productivity/10-sector/.

Decker, R.A., Haltiwanger, J., Jarmin, R.S., Miranda, J., 2017. Declining dynamism, allocative efficiency, and the productivity slowdown. Amer. Econ. Rev. 107 (5), 322–326.

Decker, R.A., Haltiwanger, J.C., Jarmin, R.S., Miranda, J., 2018. Changing business dynamism and productivity: Shocks vs. responsiveness. In: Technical Report. National Bureau of Economic Research.

Feenstra, R.C., Inklaar, R., Timmer, M.P., 2013. The next generation of the Penn World Table. Available for download at www.ggdc.net/pwt.

Fukuyama, F., 1992. The End Of History And The Last Man. Simon and Schuster.

Gwartney, J., Lawson, R., Hall, J., Murphy, R., 2020. Economic Freedom Of The World: 2020 Annual Report. Fraser Institute. Vancouver, BC, Dataset downloadable at: http://www.freetheworld.com/release.html.

Hall, R., Jones, C., 1999. Why do some countries produce so much more output per worker than others? Q. J. Econ. 114, 83–116.

Haskel, J., Westlake, S., 2017. Capitalism Without Capital: The Rise Of The Intangible Economy. Princeton University Press.

Herrendorf, B., Rogerson, R., Valentinyi, A., 2014. Growth and structural transformation. In: Handbook Of Economic Growth. vol. 2, Elsevier, pp. 855–941.

Holcombe, R.G., 2018. Political Capitalism: How Economic And Political Power Is Made And Maintained. Cambridge University Press, Cambridge, United Kingdom; New York, NY.

Hsieh, C.-T., Klenow, P.J., 2009. Misallocation and manufacturing TFP in China and India. Q. J. Econ. 124 (4), 1403–1448.

Islam, N., 1995. Growth empirics: A panel data approach. Q. J. Econ. 110, 1127–1170.

Iversen, T., Soskice, D., 2019. Democracy And Prosperity. Princeton University Press, Princeton and Oxford.

Jong-A-Pin, R., 2009. On the measurement of political instability and its impact on economic growth. European J. Political Econ. 25, 15–29.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2010. The worldwide governance indicators: Methodology and analytical issues. In: World Bank, Policy Research Working Paper 5430. http://dx.doi.org/10.1596/1813-9450-5430.

Levine, R., Loayza, N., Beck, T., 2000. Financial intermediation and growth: Causality and causes. J. Monet. Econ. 46, 31–77.

Lipset, S.M., 1959. Some social requisites of democracy: economic development and political legitimacy. Am. Political Sci. Rev. 53, 69–105.

Mankiw, N.G., Romer, D., Weil, D., 1992. A contribution to the empirics of economic growth. Q. J. Econ. 107, 407–437.

Marshall, M.G., Gurr, T.R., 2020. Polity5 Project: Political regime characteristics and transitions, 1800-2018. Dataset User's Manual. Center for Systemic Peace, Dataset downloadable at: http://www.systemicpeace.org/inscrdata.html.

McMillan, M., Rodrik, D., Sepulveda, C., 2017. Structural Change, Fundamentals And Growth: A Framework And Case Studies. International Food Policy Research Institute, Washington, DC.

McMillan, M., Rodrik, D., Verduzco-Gallo, I., 2014. Globalization, structural change, and productivity growth, with an update on Africa. World Dev. 63, 11–32.

Méon, P.-G., Sekkat, K., 2021. A time to throw stones, a time to reap: how long does it take for democratic transitions to improve institutional outcomes? J. Inst. Econ. 1–15.

Milanovic, B., 2019. Capitalism, Alone. Belknap Press, Cambridge, MA, and London.

Ng, Y.-K., 2015. Is an increasing capital share under capitalism inevitable? European J. Political Econ. 38, 82–86.

Nickell, S., 1981. Biases in dynamic models with fixed effects. Econometrica 49, 1417–1426.

North, D., 1990. Institutions, Institutional Change And Economic Performance. Cambridge University Press, Cambridge.

Olson, M., 1982. The Rise And Decline Of Nations. Yale University Press, New Haven.

O'Mahony, M., Timmer, M.P., 2009. Output, input and productivity measures at the industry level: the EU KLEMS database. Econom. J. 119 (538), F374–F403.

Rode, M., Gwartney, J.D., 2012. Does democratization facilitate economic liberalization? European J. Political Econ. 28 (4), 607–619.

Rodrik, D., 1996. Understanding economic policy reform. J. Econ. Lit. 34 (1), 9–41.

Rodrik, D., 2011. The future of economic convergence. In: Technical Report. National Bureau of Economic Research.

Tavares, J., Wacziarg, R., 2001. How democracy affects growth. Eur. Econ. Rev. 45, 1341–1378.

Timmer, M.P., de Vries, G.J., de Vries, K., 2015. Patterns of structural change in developing countries. In: Weiss, J., Tribe, M. (Eds.), Routledge Handbook Of Industry And Development. Routledge, London and New York, pp. 65–83.

Wang, Y., Bellemare, M., 2020. Lagged variables as instruments. Working Paper available at: http://marcfbellemare.com/wordpress/wp-content/uploads/2020/09/WangBellemareLagIVsJuly2020.pdf.

Young, A.T., Lawson, R.A., 2014. Capitalism and labor shares: A cross-country panel study. European J. Political Econ. 33, 20–36.