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Article

Structural Reforms and Labor Productivity Growth in Developing Countries: Intra or Inter-Reallocation Channel?

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Abstract

This paper employs sectoral data to draw conclusions on how structural reforms—implemented during the period 1975–2005—affected differences in cross-country aggregate labor productivity growth in developing countries. Most important, it explores how the effects of reforms on productivity growth are distributed between the intrasectoral and intersectoral components of labor productivity growth. The findings indicate that most of the trade, product market, and financial sector reforms have increased productivity growth. Looking at the subcomponents of labor productivity growth, the results show that structural reforms work mainly through the intra-allocative efficiency channel but not through the interallocative efficiency channel. The intrasectoral component is the main driver of the impacts of reforms on productivity growth, with a contribution that ranges from 76 percent to 96 percent depending on the reform measure considered. The paper also examines the role of labor market regulations and finds that labor market rigidity/flexibility matters for how specific reforms induce reallocation of resources within and across sectors.

JEL classification: E24, J24, L16, O47

Keywords: developing countries, productivity growth, structural change, structural reforms

1. Introduction

A long-standing observation in economics is that large differences in productivity are the dominant source of the disparities in living standards and GDP per capita across countries

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(Foster-McGregor and Verspagen 2016; Restuccia and Rogerson 2017). The rate at which aggregate labor productivity grows depends on two components: the intrasectoral component (within effect) and the intersectoral component (between effect), also known as structural change. The former indicates the average growth rate of labor productivity within the sectors of an economy, while the latter measures the growth rate of labor productivity due to labor movement across the sectors of an economy. Differences in patterns of structural change explain much of the variation in total labor productivity growth among developing regions. For instance, many Asian countries have successfully undergone a deep structural change that boosted labor productivity while most African and Latin American countries have recorded relatively low labor productivity growth, driven mainly by within-sector productivity growth (McMillan, Rodrik, and Verduzco-Gallo 2014). This raises the question of why some developing countries have higher labor productivity growth, higher within-sector productivity growth, and a more dynamic shift of labor across sectors than others.

This paper uses sectoral data for developing countries to draw lessons on how different types of structural reforms implemented during the period 1975–2005 affected differences in cross-country aggregate labor productivity growth and how these effects are distributed between the intrasectoral and intersectoral components of labor productivity growth. It is often argued that the persistent intersectoral productivity gaps across countries (Duarte and Restuccia 2010; Gollin, Lagakos, and Waugh 2014) and within countries (McMillan, Rodrik, and Verduzco-Gallo 2014) are caused by structural rigidities that prevent the efficient allocation of resources within and across sectors. Also, differences in sectoral productivity are related to market or government failures, such as policy distortions introduced in many developing countries during the import-substitution era. Therefore, structural reforms are expected to improve intrasectoral and intersectoral allocative efficiency, hence productivity growth, more rapidly in developing countries (see, for example, the Berg's report, World Bank 1981). Related literature has also identified structural reforms as important determinants of economic performance, including labor productivity growth, by engendering an efficient reallocation of resources such as labor, reducing rigidities that exist in markets, liberalizing capital flows, and boosting international trade (Bourlès et al. 2013; Casu et al. 2013; Prati, Onorato, and Papageorgiou 2013; Dabla-Norris, Ho, and Kyobe 2016; Adamopoulos and Restuccia 2019). Yet, most of these studies do not assess how effects of structural reforms are distributed between the intrasectoral and intersectoral components of labor productivity growth, masking the allocative efficiency channels through which reforms affect labor productivity growth.

This paper fills the gap in the literature by analyzing the impacts of trade, product market, and financial sector reforms on labor productivity growth, and by exploring whether these reforms affect labor productivity growth by inducing a more efficient reallocation of resources either within sectors or across sectors or both. In doing so, this paper is the first attempt to quantify how labor productivity growth effects of structural reforms are distributed between the intrasectoral and the intersectoral components in developing countries. For the analysis, the study merges the structural reform dataset from Prati et al. (2013) with labor productivity data computed from sectoral data from the Groningen Growth and Development Center 10-Sector Database and the Expanded Africa Sector Database.[1] The various sectors considered in the analysis include agriculture, industry (manufacturing and nonmanufacturing), and seven services sectors. The sample covers the period 1975–2005 and includes all developing countries for which data on reforms, value-added, and employment are available. The shift-share method (McMillan and Rodrik 2011) is employed to decompose labor productivity growth into the intrasectoral and the intersectoral components. The findings show that trade and product market reforms—tariffs, the current account, and electricity and telecommunications (henceforth network) reforms—are positively associated with labor productivity growth. Similarly, financial sector reforms—such as domestic finance, banking, and securities reforms—also have positive and statistically significant effects on labor productivity growth.

1 Countries are classified as developing based on the World Bank country classification.

Looking at the components of labour productivity growth, the paper finds that structural reforms affect the within and structural change components differently. Most of the trade, product market, and financial sector reforms positively affect the within component but have no significant effects on the structural change component of labor productivity growth. The contribution of the effects of structural reforms on overall productivity growth arising from the within component accounts for between 76 percent and 96 percent depending on the measure of reforms that are considered.[2] The contribution that comes from the structural change component thus varies between 4 percent and 24 percent, with a negative contribution observed in most cases. These findings suggest that structural reforms work mostly through the intra-allocative efficiency channel but not through the interallocative efficiency channel. That is, structural reforms induce an efficient reallocation of resources within sectors but not across sectors. These results are consistent with the argument that many developing countries had structural adjustment programs without structural change (Page 2012). To dig deeper into the possible reasons why past reforms have had little impact on structural change, the paper explores whether (*de jure*) labor market regulation is an important factor that could shape the correlation between reforms and structural change. The results highlight the fact that agricultural sector and current account reforms positively affect the intersectoral component when labor market regulations are flexible. In contrast, they negatively affect the intersectoral component when labor market regulations are too rigid.

The paper adds to the limited literature on the impact of reforms on productivity in developing countries. A growing literature has identified misallocation as an important source of aggregate productivity differences across countries.[3] Misallocation arises from frictions or structural rigidities that prevent the efficient allocation of resources. The frictions that drive cross-country differences in productivity and allocative efficiency include, among others, entry barriers (Ciccone and Papaioannou 2008), labor market distortions (Haltiwanger, Scarpetta, and Schweiger 2014) trade restrictions (Wacziarg and Wallack 2004), credit frictions (Bai, Carvalho, and Phillips 2018), financial market distortions (McKinnon and Pill 1998; Buera, Kaboski, and Shin 2011), market power (De Loecker, EEchout, and Unger 2020), and monopoly power (Cheremukhin et al. 2017). Most of these studies focus on misallocations and productivity growth with little emphasis on how structural reforms that aim at removing or reducing misallocations affect productivity growth in developing countries.

To the best of the authors' knowledge, Dabla-Norris, Ho, and Kyobe (2016) and ElFayoumi et al. (2018) are among the few papers examining the impact of structural reforms on productivity growth in emerging markets and developing countries. Unlike the present paper, Dabla-Norris et al. (2016) did not explore the distributional effects of reforms between the intrasectoral and intersectoral components. ElFayoumi et al. (2018) focus mainly on how structural reforms affect the sectoral labor adjustment speed that closes the productivity gap between the agriculture sector and the other sectors in a country, but they do not investigate the net effects of reforms on productivity growth and its subcomponents. The present study is the first to examine how structural reforms affect both within and structural change components of productivity growth in developing countries and evaluates the relative importance of reforms on both components.[4]

The remainder of the paper is structured as follows. Section 2 discusses the theoretical mechanisms through which reforms may affect the between and within effects. Section 3 describes the datasets.

2 The only exception is agriculture reform, for which the contribution is equally distributed between the within and the structural change components, but its effect on the growth rate of labor productivity is not significant.

3 Restuccia and Rogerson (2008); Hsieh and Klenow (2009); Bartelsman, Haltiwanger, and Scarpetta (2013); and Hopenhayn (2014).

4 There are also existing studies at the firm level that assess the impact of structural reforms on productivity growth in developing countries (Eslava et al. 2004; Amiti and Konings 2007; Topalova and Khandelwal 2011; Arnold et al. 2016; and Kouamé and Tapsoba 2019).

Section 4 discusses descriptive statistics and the empirical strategy. Section 5 reports and discusses the estimation results. Section 6 presents concluding remarks.

2. Theoretical Mechanisms

In the literature, the link between reforms and productivity is indirect and often acts through specific channels. This section discusses some of these channels, particularly how trade reforms, product market reforms, and financial market reforms may affect productivity growth either through the within effect or between effect.

Trade reforms

Trade reforms aim at reducing or eliminating frictions and costs that affect the free movement of goods and services across countries. From classical models of trade such as Ricardo's theory of comparative advantage to "new" new trade theory (NNTT), such as the seminal work of Melitz (2003), increasing the degree of openness to trade has implications on the allocation of resources within and across sectors. In classical models, countries specialize in different economic activities based on their relative differences in technology—in Ricardo's model—and factor endowments—in the Heckscher–Ohlin model. In both models, trade liberalization induces a reallocation of resources across sectors in response to changes in relative prices. In the endogenous growth models with increasing returns to scale where trade openness facilitates the transmission of technology and impacts upon long-run growth (Grossman and Helpman 1991), reductions in trade frictions may affect the intersectoral shifts of resources if the transfer of technology affects the modern and traditional sectors differently. By inducing the reallocation of resources across sectors, trade reforms can affect labor productivity growth through the structural change component.[5]

Another set of models demonstrates how trade liberalization affects intraindustry productivity growth without necessarily changing the specialization patterns of countries and hence structural change. In "new" new trade theory and new trade theory models with heterogeneous firms, differentiated products, and increasing returns to scale, trade occurs within narrowly defined sectors, inducing a reallocation of resources towards more productive firms within the same industry. For example, Melitz (2003) analyzed the mechanism for the impact of trade on industry productivity performance. Consistent with these theoretical predictions, Pavcnik (2002), in a study of Chilean manufacturing plants, found that trade liberalization improves within-plant productivity for the plants in the import-competing sector. From the study, aggregate productivity improvement is primarily due to resource reallocation from less to more efficient plants. A similar study in Vietnam finds a significant reallocation of labor from informal microenterprises to the formal manufacturing sector in response to export opportunities due to the U.S. tariff reductions (McCaig and Pavcnik 2018).

Product Market Reforms

Product market reforms remove impediments to the proper functioning of markets by increasing competition among producers of goods and services. Nicodeme and Sauner-Leroy (2007) argue that product market reforms affect productivity through three indirect mechanisms: allocative efficiency, productive efficiency, and dynamic efficiency. Allocative efficiency refers to across-plant or sector reallocation; productive efficiency refers to within-plant efficiency; and dynamic efficiency refers to innovation and technological change arising from reforms.

First, product market reforms such as deregulation of agricultural markets and liberalization of the telecommunication sector eliminate unnecessary government interventions and barriers to entry, and they

5 For example, Wacziarg and Wallack (2004) explore the effect of trade liberalization and intersectoral labor movements in developing countries and found evidence of trade-induced structural change at the country level.

open up markets. This increases competition in the market and reduces economic rents such as mark-ups. Depending on the heterogeneity of mark-ups across sectors and the interconnectedness of the deregulated sector to other sectors of the economy, the allocative efficiency effect of product market reforms will increase aggregate productivity growth, either through the reallocation of resources across or within sectors.[6] Second, product market liberalization increases competition, forcing firms to allocate available resources efficiently by reducing or eliminating the underutilization of factors of production such as labor and capital. Thus, increased exposure to competition impacts resource allocation within plants.[7] Finally, product market reforms also affect productivity through dynamic efficiency or the Schumpeterian engine of growth. Schumpeterian models emphasize that competition reduces economic rents. However, due to the fear of losing economic rents, firms have great incentives to innovate. Conversely, new endogenous growth models find that competition increases the incentives to innovate to escape competition.[8] The absorptive capacity and the type of industry influence the incentives for innovation (Nicodeme and Sauner-Leroy 2007; Aghion et al. 2009). Innovation, in turn, spurs resource reallocation and productivity growth (Acemoglu et al. 2018).

Financial Markets Reforms

The main role of financial institutions is to facilitate the efficient allocation of resources in an economy. Schumpeter (1912) argued that financial institutions have the ability to identify entrepreneurs with prospects and can, therefore, help channel resources to their most productive uses. A well-functioning financial sector is a precondition for efficient resource allocation and potential long-run economic growth (Levine 1997, 1999). However, the financial sector in developing countries is characterized by high levels of frictions such as excess control and interference from the state. These financial frictions account for a substantial part of cross-country differences in labor productivity (Buera, Kaboski, and Shin 2011). Financial sector reforms—mostly through structural adjustment loans—aim to remove the systemic repressions and restrictions on the price and quantity of credit, boost productivity growth by generating higher levels of domestic investment, and encourage a more efficient allocation of capital within and across sectors (Graham 1996; Dabla-Norris, Ho, and Kyobe 2016).[9] For within-sector productivity growth, financial reforms lower the cost of credit, allowing financially constrained firms to access capital and produce more efficiently (see, for example, Larrain and Stumpner 2017). Furthermore, it enables the financing of new machinery, the adoption of new production techniques, and innovation within industries.

Conversely, financial reforms affect structural change by inducing the reallocation of capital and investment to more productive industries. For instance, there is an indication that well-developed financial systems increase investment more in growing industries and decrease investment in declining industries than less-developed financial systems (Wurgler 2000). Furthermore, there is evidence that countries with well-developed financial markets have relatively high correlated intersectoral growth rates (structural change) and respond better to global opportunities (Fisman and Love 2004). This evidence implies that financial reforms may also boost productivity growth through structural change by removing restrictions and state interference.

6 Aghion, Braun, and Fedderke (2008), for example, find that high mark-ups have a large negative impact on productivity growth in the South African manufacturing industry. In an experiment, they show that an increase in product market competition that reduces mark-ups by 10 percent would increase productivity growth by 2–2.5 percent.

7 Holmes and Schmitz (2010), for example, provide a model of change in competition whereby efficient resource allocation within plants is identified as one of the main mechanisms through which changes in the competitive environment can impact intraindustry productivity.

8 There is evidence that at lower and higher levels of competition, innovation activity is low (Aghion et al. 2005). Thus, the empirical relationship between competition and innovation is an inverted U-shape.

9 Evidence suggests that financial liberalization improves allocative efficiency by allowing investment funds to go to firms with a higher marginal return to capital (Galindo, Schiantarelli, and Weiss 2007).

3. Data

The Structural Reforms Data

The objective in this paper is to analyze the effects of structural reforms on labor productivity growth and its two subcomponents in a sample of developing countries. To measure structural reforms, the study employs the dataset on real sector reforms and financial sector reforms from Prati, Onorato, and Papageorgiou (2013).[10] Compared to existing structural reforms datasets in the literature, this database has the advantage of covering more than 90 countries across the world with a long-time series dimension. For trade reforms, the study employs indicators related to openness to international trade and product market liberalization. Openness to international trade is measured over two dimensions: (1) the average tariff rate and (2) the restrictions on current account transactions that include payments and receipts on exports and imports of goods and services. Restrictions on current account transactions measure restrictions on the proceeds from trade transactions, rather than on the underlying transactions as several countries, in practice, use restrictions on trade proceeds as a type of trade restriction. In the context of theoretical discussions, the study expects trade reforms to affect productivity growth positively, but whether this will work either through the within effect or between effect or both cannot be determined, a priori. The study uses each dimension of the openness to international trade individually in the regressions.

Product market reforms are agricultural sector reforms and the degree of liberalization in the telecommunication and electricity markets (network sector reforms). Agricultural sector reforms measure the extent of public intervention in the market of the country's main agricultural export commodity, the presence of export marketing boards, and the incidence of administrated prices. The degree of liberalization in the telecommunication and electricity markets accounts for the existence of an independent regulator and the extent of competition in the provision of the services. The regressions will include the indexes of agricultural sector reforms and liberalization in the network sector separately.

The indicators of financial reforms derived from Abiad et al. (2008) include two main indexes. The first index measures the degree of domestic financial liberalization, which is an average of six subindices: (1) credit controls accounting for subsidized lending and directed credit, (2) interest rate controls such as floors and ceilings, (3) competition restrictions related to entry barriers and limits on several bank branches, (4) the importance of state ownership, (5) the quality of banking supervision and regulation, and (6) the degree of legal restrictions on the development of domestic bonds and equity markets and the existence of independent regulators. Of the six subindices, the first five subindices document reforms in the banking system while the sixth index captures reforms in the securities sector. This study's strategy consists of introducing the aggregate domestic financial liberalization index and two separate indexes of reforms in the banking system and securities sector.

The second index of financial sector reform captures the degree of external capital account liberalization. This is an average of two subindicators measuring the intensity of restrictions on residents and nonresidents in moving capital in and out of a country. The external capital account liberalization index captures a broad set of restrictions on financial transactions for residents and nonresidents and the use of multiple exchange rates. In the regressions, the study includes the aggregate index of external capital account liberalization and two separate indices of capital account liberalization for residents and nonresidents. As in the original database, all (normalized) reform indicators range between 0 and 1, with a higher value corresponding to a higher degree of liberalization in the associated sector. Consistent with the theoretical discussion, the study expects the domestic financial liberalization variable to affect both between and within effects through the efficient allocation of capital and investments. Financial openness may also affect productivity by improving domestic allocative efficiency, by allowing countries to share

10 See Prati, Onorato, and Papageorgiou (2013) in the supplementary online appendix for the list of countries covered by this database and detailed information on the methodology employed.

risks and invest in riskier but effectively high-return firms/sectors (e.g., see the model of Obstfeld 1994). The study expects external financial liberalization to affect productivity through both the between and the within channels.

Sectoral Indicators Data

To compute labor productivity growth and its subcomponents, the study uses the Groningen Growth and Development Center (GGDC) 10-sector database (Timmer, de Vries, and de Vries 2015) and its Extended Africa Sector Database (EASD) (Mensah and Szirmai 2018; Mensah et al. 2018). These datasets have been widely used to analyze productivity across time and space because of their coverage and reliability. The GGDC 10-sector database provides long-run harmonized sectoral data on nominal value-added, real value–added, and employment for 10 broad sectors of the economy in 41 countries, mostly from the 1960s to 2010.[11] This dataset is complemented with the EASD, which updates value-added and employment data for the 11 existing African countries. EASD also extends the coverage of the data to 7 new countries in Africa, increasing the sample to 49 countries. The analysis is based on the 36 developing countries covered in the GGDC 10-sector database and EASD.

Using this dataset, the shift-share methodology is applied to decompose labor productivity growth in developing countries. As mentioned above, labor productivity in a country can grow in two ways; either within sectors due to innovation, capital accumulation, and more efficient allocation of resources across plants or through the movement of workers from low-productivity sectors to high-productivity sectors.

Aggregate labor productivity growth at time t is defined as the weighted sum of sectoral productivity, with the weights being the employment shares, that is:

$$q_t = \sum_i q_{it} s_{it}, \tag{1}$$

where q_{it} is labor productivity of sector i at time t given by $q_{it} = {Q_{it}}/{l_{it}}$, with Q_{it} being sector i's real value-added and, l_{it} being the number of persons employed in sector i at time t. Real value-added (volume) is used to measure the growth of output per worker because the nominal value added conflates movement in quantities and prices. s_{it} is the sectoral employment share defined as the ratio of each sector's employment to the total employment of the economy at time t. Given the above, many researchers have decomposed labor productivity growth between time $t-1$ and t using variant forms of the shift-share method.[12] This paper takes inspiration from McMillan and Rodrik (2011) to decompose aggregate labor productivity growth. The approach is given as:

$$\dot{q} = \frac{\Delta q}{q^{t-1}} = \sum_{i=1}^{N} \left[\frac{\left(q_i^t - q_i^{t-1}\right) s_i^{t-1}}{q^{t-1}} \right] + \sum_{i=1}^{N} \left[\frac{\left(s_i^t - s_i^{t-1}\right) q_i^t}{q^{t-1}} \right]. \tag{2}$$

Where N is the number of sectors that exist in the economy. The first term on the right-hand side is the within effect, and the second term is the reallocation effect (structural change). The within effect measures average productivity growth within sectors of an economy, and the between effect measures productivity growth mainly due to the movement of labor across the sectors of an economy.

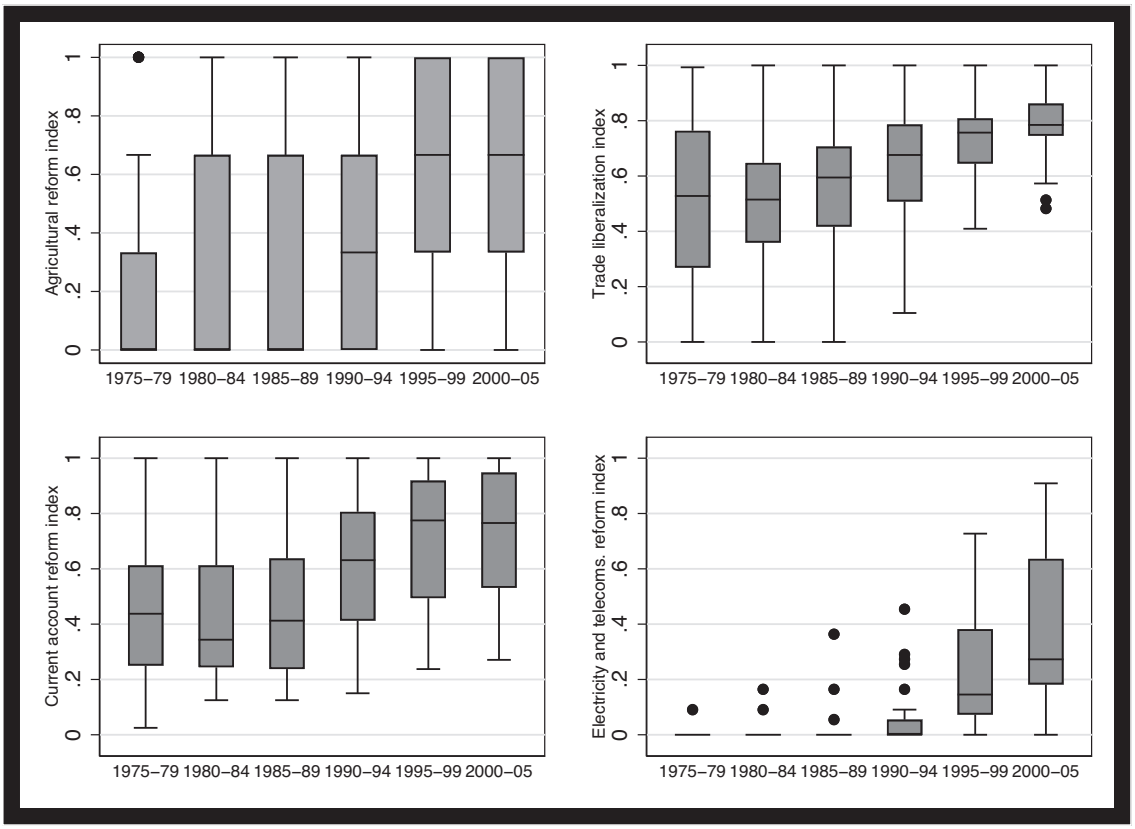
Descriptive Statistics

This section discusses the variation in reform indices, the patterns over time of labor productivity growth, and structural change in developing countries included in the sample. Figure 1 and fig. 2 show the

11 Of the 42 countries, 11 countries are in Africa, 11 countries are in Asia, 2 countries in MENA, 9 countries are in Latin America, and 8 countries are in Europe and the United States.

12 See, for example, Fabricant (1942); McMillan, Rodrik, and Verduzco-Gallo (2014); and Timmer, de Vries, and de Vries (2015).

Figure 1. Real Sector Reforms

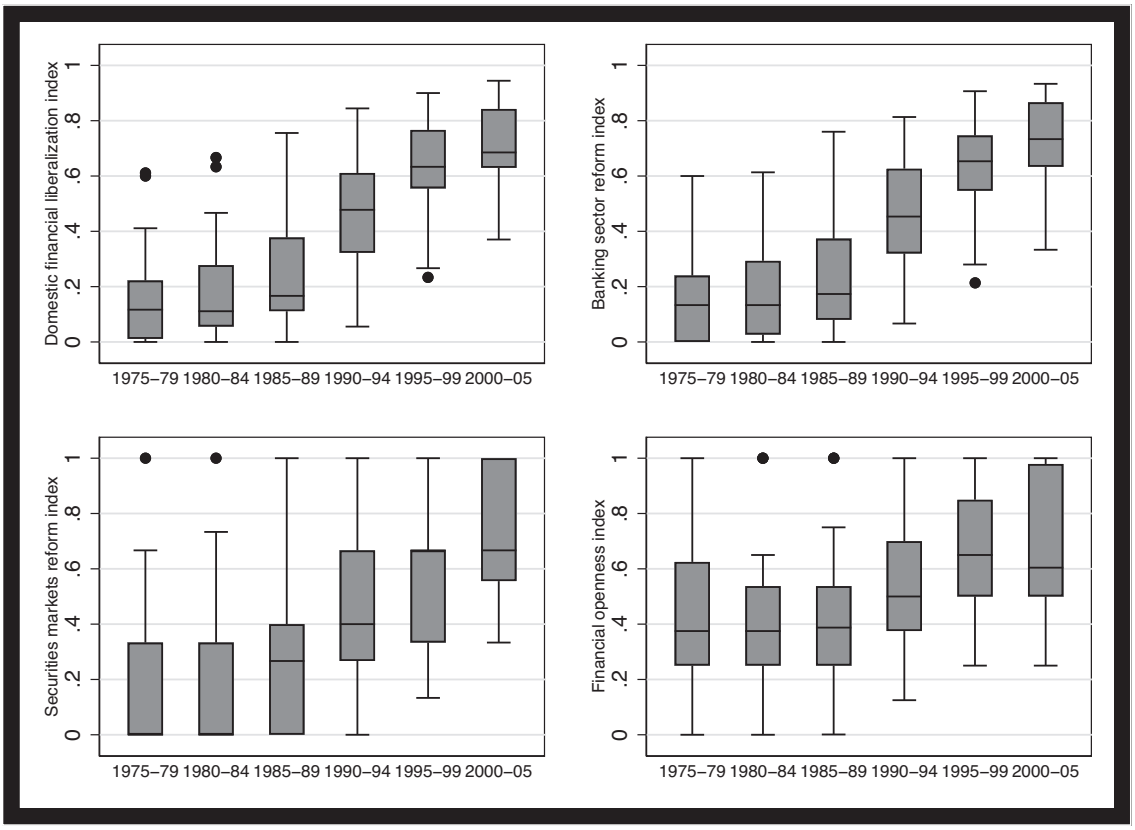


Source: Authors' calculation based on Prati, Onorato, and Papageorgiou (2013). Higher values indicate a higher degree of liberalization.

evolution of the (five-year average) indices of real sector reforms and financial markets reforms, respectively, since 1975. For the real sector, reforms related to trade have been more pronounced than reforms related to agriculture and electricity and telecommunications. This is consistent with the observation that structural adjustment programs in the products market were mostly preoccupied with trade openness. In addition, the study finds that the distribution of the trade liberalization index narrows over time, indicating that most countries further liberalized their trade regimes. Countries in the sample also underwent deep financial liberalization. The study observes a strong variation over time in the domestic financial sector reforms and its two components—banking and securities markets, as well as the financial openness index (capital accounts index). The strong financial liberalization observed in developing countries may be explained by the fact that the structural adjustment programs or most IMF programs are highly contingent on the recipient's commitment to financial and fiscal reforms.

Table 1 shows the results of the productivity decomposition exercise by region, respectively. The table confirms regional differences in labor productivity growth, highlighting the potential differences in allocative and productive efficiency. For example, the highest labor productivity growth is observed in Asia, where productivity grew by about 3.5 percent per annum on average. In contrast, productivity growth decreased by about 0.2 percent per annum on average in Latin America due to weak productivity growth within sectors. Productivity grew by 1.4 percent in Sub-Saharan Africa (SSA), with structural change contributing as much as the within effect. There is heterogeneity in productivity growth of the countries within each region. The highest heterogeneity is observed in Africa, with a standard deviation

Figure 2. Financial Markets Reforms



Source: Authors' calculation based on Prati, Onorato, and Papageorgiou (2013). Higher values indicate a higher degree of liberalization.

of 6.5 percent. For example, productivity growth is as high as 4.6 percent in Botswana but as low as −0.1 percent in Ethiopia during the same period (see table S1.1 in the supplementary online appendix).

The observed productivity growth differences between Asian and non-Asian developing countries are well-documented in the literature. For example, Timmer et al. (2014) find similar productivity patterns and show that while structural change in Asia is characterized by reallocation of labor towards sectors that experience both above-average productivity levels and above-average productivity growth, in Africa and Latin America, resources move toward sectors with above-average productivity, but below-average productivity growth, resulting in dynamic productivity loses. McMillan, Rodrik, and Verduzco-Gallo (2014) find a similar productivity difference and argue that the difference in aggregate labor productivity growth between Asian economies and non-Asian economies is due to different patterns of structural change. Relating these findings to the speed of transition from one income level to another, Foster-McGregor and Verspagen (2016) show that the high level of labor productivity growth helped Asian countries to transition faster from one income level to another, compared to non-Asian countries.

4. Estimation Model

To estimate the effects of structural reforms on labor productivity growth and its two subcomponents, the study follows Prati, Onorato, and Papageorgiou (2013), which uses an OLS model to estimate the correlations between structural reforms and output per capita growth. The three main dependent variables

Table 1. Annual Labor Productivity Growth by Region (percent), 1975–2005

Region	Mean (within)	Mean (structural change)	Mean (LP growth)	Standard deviation (LP growth)
SS Africa	0.7	0.7	1.4	6.5
Asia	2.9	0.6	3.5	1.8
Latin America	−0.8	0.7	−0.2	4.8
MENA	1.5	0.7	2.2	5.2

Source: Authors' calculation based on the GGDC 10-sector database and Expanded Africa Sector Database. Figures are unweighted averages across countries within each region. Due to rounding, the components may not be exactly equal to total productivity growth in this table.

in this study are the annual growth rate of labor productivity and both the within and between components of labor productivity growth. In the baseline model, the study estimates the effects of trade, product market, and financial sector reforms on the aggregate growth rate of labor productivity between time $t-1$ and t. The estimating equation is given as follows:

$$Ln(Productivity_{it}) - Ln(Productivity_{it-1}) = \alpha_0 + \alpha_1 Reforms_{it-1} + \alpha_2 Ln(Productivity_{it-1}) + \alpha_3 X_{it-1} + \sigma_i + t + \in_{it}. \quad (3)$$

The dependent variable $Ln(Productivity_{it}) - Ln(Productivity_{it-1})$, is the annual growth rate of labor productivity for country i at time t. The key parameter of interest is α_1 which measures the effect of a given reform on the growth rate of labor productivity. Because different types of reforms may yield different outcomes, it is important to use the disaggregated indicators. The different reforms are introduced separately in the model because some of the reform variables are highly correlated among them. The study also controls for the one-year lag of labor productivity, $Ln(Productivity_{it-1})$ to test for convergence across countries. In some of the specifications, other control variables are added, which include the growth rate of the population and endowments of physical and human capital, as well as an indicator of the quality of institutions. Vector t includes period dummies.

The novelty in this paper is to analyze the effect of reforms on the within and the between components of the growth rate of labor productivity. The linear OLS model makes it possible to effectively regress the within component and the structural change component on reforms as a means of decomposing the effect of reforms into an intrasectoral allocative efficiency channel and an intersectoral allocative efficiency channel, respectively. The estimating equations are given as follows:

$$Within_{it} = \beta_0 + \beta_1 Reforms_{it-1} + \beta_2 Ln\left(Productivity_{it-1}\right) + \beta_3 X_{it-1} + \sigma_i + t + \mu_{it}, \quad (4)$$

$$Structural\_change_{it} = \delta_0 + \delta_1 Reforms_{it-1} + \delta_2 Ln\left(Productivity_{it-1}\right) + \delta_3 X_{it-1} + \sigma_i + t + \vartheta_{it}. \quad (5)$$

Because the estimation models are linear and the dependent variable in equation (3) is the sum of the dependent variables in equations (4) and (5) and the control variables are the same across the three equations, the effect of a given reform on the aggregate labor productivity growth, α_1, is the sum of the effects of the reform on the two components of the aggregate labor productivity growth. In terms of contribution, the fraction of the effect of a reform on labor productivity growth that comes through the within component is $(\frac{|\beta_1|}{|\beta_1|+|\delta_1|})$. and the fraction that comes through the between component is $(\frac{|\delta_1|}{|\beta_1|+|\delta_1|})$. The sign of β_1 (δ_1) indicates whether the within (between) component has a negative or a positive contribution to the total effect of a reform on labor productivity growth.

For robustness, the study employs the dynamic panel method proposed by Arellano and Bond (1991) (AB GMM) to correct for possible endogeneity in estimating the effects of reforms on labor

Table 2. Reforms and Aggregate Labor Productivity Growth

Dependent variable: LnProd(t)-LnProd(t−1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade reforms										
Tariffs(t−1)	0.024**									
	(0.011)									
Current account(t−1)		0.028**								
		(0.013)								
Product market reforms										
Agriculture(t−1)			0.005							
			(0.009)							
Network(t−1)				0.019**						
				(0.008)						
Financial sector reforms										
Domestic finance(t−1)					0.022**					
					(0.009)					
Banking(t−1)						0.020**				
						(0.009)				
Securities(t−1)							0.022***			
							(0.008)			
Capital(t−1)								0.014		
								(0.010)		
Capital resident(t−1)									0.007	
									(0.009)	
Capital nonresident(t−1)										0.013
										(0.008)
LnProd(t−1)	−0.066***	−0.040**	−0.032	−0.024	−0.040***	−0.039***	−0.040***	−0.037**	−0.036**	−0.036**
	(0.015)	(0.018)	(0.019)	(0.016)	(0.012)	(0.012)	(0.013)	(0.016)	(0.017)	(0.016)
Constant	0.661***	0.393**	0.326	0.242	0.400***	0.395***	0.401***	0.373**	0.367**	0.367**
	(0.146)	(0.178)	(0.199)	(0.164)	(0.122)	(0.121)	(0.136)	(0.166)	(0.172)	(0.167)
Observations	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
No. of countries	34	32	31	31	28	28	28	32	32	32
R-squared	0.193	0.161	0.163	0.128	0.152	0.152	0.154	0.154	0.152	0.154

Source: Authors' calculation.

Note: Robust standard errors cluster within countries in parentheses. All the estimations include country fixed-effects and period dummies. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

productivity growth.[13] However, the AB GMM does not make it possible to quantify the distributional effect of structural reforms between the within effect and the between effect because with the AB GMM model, the dependent variable in equation (3) is labor productivity in level, which cannot be decomposed into within and between components. Furthermore, the study estimates a five-year labor productivity growth model to account for the fact that some of the reforms may take longer to affect labor productivity growth and its subcomponents.

5. Results and Discussion

Reforms and Aggregate Labor Productivity Growth

The baseline results are reported in table 2 below, where the study regresses the growth rate of labor productivity on trade, product market, and financial sector reforms. The results show that trade reforms and electricity and telecommunications liberalization have positive effects on the growth rate of labor

13 The use of the lagged dependent variable as a regressor in equation (3) may violate the strict exogeneity assumption if the lagged dependent variable and the general error term are correlated. The Arellano-Bond (AB) GMM estimator deals with the endogeneity by taking the first difference of equation (3) to remove country-specific unobserved heterogeneity and using lags of the dependent variable as instruments. However, the GMM does not make it possible to quantify the distributional effect of structural reforms between the within effect and the structural change effect because, with the GMM, the dependent variable in equation (3) is labor productivity in level, which cannot be decomposed into within and between components.

productivity, and the estimates are statistically significant at the 5 percent significance level. The result of trade reforms is consistent with expectations of classical trade theory or "new" new trade theory where trade liberalization could increase labor productivity growth either through specialization according to comparative advantage or provide new opportunities for profits only to the most productive firms, allowing them to pay the entry costs of exporting. As the productive firms expand due to new market opportunities from trade, they increase demand for labor, raising real wages and forcing the least productive firms to exit, inducing a more efficient allocation of resources within sectors. Similarly, electricity and telecommunications liberalization could increase productivity by increasing competition, leading to a reduction in marks-ups and market power, hence a more efficient allocation of resources within or across sectors. The statistically insignificant effect of agricultural reforms is consistent with existing findings that showed that the impact of agricultural reforms on key outcomes such as agricultural production and modern input usage had not met expectations in some developing countries. For example, Kherallah et al. (2000) find that following reforms in the agricultural sector, the average growth rate of agricultural production per capita and modern input use was negative in Africa in the 1980s and 1990s.

For financial sector reforms, the study finds that the estimates on domestic finance, banking, and securities are positive and statistically significant at the 5 percent or 1 percent significance levels, depending on the reform considered. These positive effects of the financial sector reforms on labor productivity growth confirm the intermediary role that the financial sector plays in the efficient allocation of productive investments (Schumpeter 1912). Contrary to domestic financial reforms, external capital account liberalization does not significantly affect labor productivity growth in the linear model. This study's results are similar to those of Rodrik (1998), who found no growth effect of general capital account liberalization. While it is possible that capital account openness could lead to an inflow of investible funds, a lower cost of capital, and increases in productive investments, there is also the risk of the Dutch disease effect, which could render the tradable sector uncompetitive.

Overall, the findings in table 2 highlight that most trade, product market, and financial sector reforms have increased the growth rate of labor productivity in developing countries. This result is in line with previous research that showed a positive relationship between structural reforms and economic growth (Prati, Onorato, and Papageorgiou 2013) and labor productivity growth (Dabla-Norris, Ho, and Kyobe 2016). The estimated coefficient on the logarithm of the initial level of productivity (LnProd($t-1$)) is negative and statistically significant across the columns, indicating a convergence process in the sample where countries with a lower level of initial labor productivity tend to grow faster.

To quantify the size of the estimated effects of reforms on labor productivity growth, the study follows the approach in Prati, Onorato, and Papageorgiou (2013) by computing the long-term multipliers.[14] This approach captures each reform's dynamics by computing the size of its effect when it moves up from its lowest value (0) to its highest value (1). It also makes it possible to compare the size of the effects of the different reforms on labor productivity growth. Using the baseline results reported in table 2, it is found that for trade reforms, a full tariffs liberalization (i.e., a discrete jump from 0 to 1) is associated with an increase of labor productivity by 36 percent in the long run. A full liberalization of the current account would yield an increase of labor productivity by 70 percent. These estimates are comparable in size with the estimates for the output per capita in Prati, Onorato, and Papageorgiou (2013).[15] However, for a full financial liberalization (domestic finance), the study finds that a discrete jump from 0 to 1 is associated with an increase of labor productivity by 55 percent in the long run. This value is less than half of the estimate for the output per capita in Prati, Onorato, and Papageorgiou (2013).

14 The estimated coefficient on a given reform is multiplied by the inverse of minus the estimated coefficient on the log of the one-year lag of labor productivity (LnProd(t−1)).

15 Prati, Onorato, and Papageorgiou (2013) find that a full tariffs liberalization is associated with an increase of 39 percent of the output per capita in the long term. Their estimate goes up to 65 percent for a full liberalization of the current account.

Table 3. Reforms and Within Component of Labor Productivity Growth

Dependent variable: Within component	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade reforms										
Tariffs(t−1)	0.028***									
	(0.010)									
Current_account(t−1)		0.027**								
		(0.011)								
Product market reforms										
Agriculture(t−1)			0.003							
			(0.007)							
Network(t−1)				0.022***						
				(0.008)						
Financial sector reforms										
Domestic_finance(t−1)					0.025***					
					(0.008)					
Banking(t−1)						0.023***				
						(0.008)				
Securities(t−1)							0.025***			
							(0.008)			
Capital(t−1)								0.020*		
								(0.010)		
Capital_resident(t−1)									0.010	
									(0.008)	
Capital_nonresident(t−1)										0.019**
										(0.009)
LnProd(t−1)	−0.069***	−0.040**	−0.033	−0.025	−0.044***	−0.043***	−0.044***	−0.038**	−0.036*	−0.037**
	(0.015)	(0.019)	(0.021)	(0.017)	(0.012)	(0.012)	(0.013)	(0.017)	(0.018)	(0.017)
Constant	0.690***	0.397**	0.340	0.259	0.445***	0.440***	0.446***	0.381**	0.374**	0.374**
	(0.147)	(0.187)	(0.212)	(0.171)	(0.125)	(0.123)	(0.136)	(0.173)	(0.181)	(0.173)
Observations	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
No. of country	34	32	31	31	28	28	28	32	32	32
R-squared	0.196	0.162	0.164	0.131	0.165	0.164	0.166	0.157	0.155	0.157

Source: Authors' calculation.

Note: Robust standard errors cluster within countries in parentheses. All the estimations include country fixed effects and period dummies. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Table S2.2 in the supplementary online appendix reports findings from the AB GMM estimation. The results further emphasize that the trade, product market, and financial sector reforms have positive and statistically significant effects on the growth rate of labor productivity. Also, the estimated coefficients of the AB GMM model are higher than the ones obtained with the baseline model. Table S2.3 in the supplementary online appendix includes additional control variables to the baseline model. These variables are the growth rate of population, a measure of human capital, and the stock of physical capital as a share of GDP. The study also includes the measure of constraints on the executive from Polity IV to capture the quality of institutions. The estimation results show that most of the reform variables that were significant in the baseline model are still significant in this model. However, the level of significance of product market and trade reforms has decreased. It is worth noting that many of the additional controls are highly correlated, and their estimated coefficients are not statistically significant. For the rest of the paper, they are removed from the analysis.

Intrasectoral or Intersectoral Reallocation Channel?

The key question of interest in this paper is whether structural reforms affect labor productivity growth by inducing a more efficient reallocation of resources within sectors, across sectors, or both. The study investigates the effects of reforms on these two channels of labor productivity growth using the baseline specification. The estimation results using the within component as the dependent variable are reported in table 3 below. Trade reforms (tariffs and current account) have sizable and significant effects on within-sector productivity growth, confirming some of the predictions of "new" new trade theory and procompetitive models of trade, particularly the idea that countries can still gain from trade without necessarily

Table 4. Reforms and Sectoral Productivity Growth

	Agriculture	Industry	Services
Trade Reforms			
Tariffs	0.00451	0.00962*	0.0101*
	(0.00387)	(0.00550)	(0.00538)
Current Account	0.00680	0.00857	0.0131**
	(0.00467)	(0.00515)	(0.00555)
Product market reforms			
Agriculture	0.000685	0.00140	0.00329
	(0.00286)	(0.00458)	(0.00354)
Network	−0.000378	0.00748**	0.0118***
	(0.00258)	(0.00328)	(0.00397)
Financial Sector Reforms			
Domestic Finance	0.00490	0.00673*	0.0104***
	(0.00311)	(0.00369)	(0.00371)
Banking	0.00478	0.00566	0.00985**
	(0.00315)	(0.00382)	(0.00367)
Securities	0.00370	0.00939***	0.00932***
	(0.00274)	(0.00322)	(0.00335)
Capital	0.00246	0.00442	0.00744
	(0.00390)	(0.00419)	(0.00461)
Capital Resident	0.000737	0.00290	0.00375
	(0.00306)	(0.00401)	(0.00441)
Capital Non-Residents	0.00268	0.00236	0.00766*
	(0.00349)	(0.00438)	(0.00425)

Source: Authors' calculation.
Note: Robust standard errors cluster within countries in parentheses. All the estimations include country fixed-effects and period dummies. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

changing their specialization patterns. Among the product market reforms, it is found that electricity and telecommunications liberalization have positive and statistically significant effects on within-sector productivity growth. By increasing the intensity of competition, product market reforms may have encouraged the spread of ideas, the adoption of better production techniques, technology spillovers, increasing technical and productive efficiency, and hence productivity growth within sectors. In contrast to the expectation that agricultural reforms will create price incentives, induce a supply response, and increase agricultural productivity growth, the study does not find any significant effect of agricultural reforms on the within effect. The lack of productivity growth within the sector may affect essential input supply to other industries. As demonstrated by Gollin (2009), agricultural productivity growth is necessary for aggregate productivity growth. Another way to think about the result is that agricultural reforms may not be relevant beyond the agricultural sector itself, hence the limited aggregate within-sector productivity. For example, table 4 reports the effects of reforms on sectoral labor productivity growth. It shows that while all other reform indices are relevant beyond agriculture, agricultural reforms have no significant impact on the labor productivity growth of industry and services. This result may reflect how agricultural reforms are measured in Prati, Onorato, and Papageorgiou (2013:948) database.[16]

16 In the database, agricultural reform is narrowly defined as "the extent of public intervention in the market of each country's main agricultural export commodity. It includes the presence of export marketing boards and the incidence of administered prices." For example, the main agricultural export commodity of Ghana is cocoa. Structural reforms in the cocoa sector may not have any effect on other sectors, such as the textile industry and telecommunications. A broader measure that includes input and output markets of agricultural products and agricultural land reforms, may capture the agricultural effect on aggregate within effect more precisely.

All the domestic financial sector reforms are significant and have the expected sign on the within component. There are many ways through which financial sector reforms may have positively affected within-sector productivity growth. Financial liberalization improves allocative efficiency by allowing investment funds to go to firms with a higher marginal return to capital (Galindo, Schiantarelli, and Weiss 2007). For within-sector productivity growth, financial reforms lower the cost of credit, allowing financially constrained firms to access capital and produce at a more efficient level. Furthermore, it enables the financing of new machinery, the adoption of new production techniques, and innovation within industries. This study's results are consistent with the empirical findings and theoretical predictions of Larrain and Stumpner (2017). However, easing restrictions on external capital has little effect (nonresidents) or no effect (resident) on within-sector productivity growth. The weak effect of financial openness relates to the benefits and costs of internal capital flows. Easing capital account restrictions could generate inflows such as foreign direct investment (FDI) that can facilitate the transfer of foreign technological knowledge and encourage competition and financial sector development. It also helps firms to insulate themselves against risk by diversification, potentially generating growth within sectors. Conversely, there are increasing risks associated with the fluctuations of international capital flows such as sudden reversals associated with investor sentiments and the Dutch disease effect.

Table 5 shows the results of the effects of reforms on the structural change component. The estimated coefficients on both financial sector, product market, and trade reforms are all insignificant. While these insignificant effects on structural change are expected from reforms such as agricultural reforms, at least in the short run, for some reforms such as trade reforms, the zero effect on structural change is surprising. Traditional trade theory predicts that countries gain from trade liberalization through specialization in areas of comparative advantage and through changes in relative prices, which induce structural change.

Overall, the findings have shown that structural reforms have increased the growth rate of labor productivity, mainly through the within component. Structural reforms work by increasing dynamic efficiency, productive efficiency (i.e., operating at a more efficient level due to competition, and allocative efficiency (i.e., inducing a more efficient reallocation of resources within sectors). However, reforms do not induce structural change in developing countries.

Table 6 decomposes the contribution of the effect of reforms on the growth rate of labor productivity that comes through the within component and through the between component. Among trade reforms current account reform is the one that has the highest effect on labor productivity growth arising through the within component. More than 96 percent of the effect of current account reforms on the growth rate of labor productivity comes through the within component, with just 3.6 percent coming from the structural change component. These values are around 88 percent and 12 percent for trade and electricity and telecommunications reforms. Agriculture is the only product market reforms for which there is an equal contribution through the within and structural change components. Still, the previous table has shown that agriculture reforms did not significantly affect any of the dependent variables. Turning now to the financial sector reforms, the study finds that domestic finance, banking, and securities reforms have roughly 89 percent of their effects on the growth rate of labor productivity coming from the within component and only around 11 percent from the structural change component. Looking at reforms on capital and resident and nonresident capital reforms, the study finds that they also record higher contributions through the within component than the structural change.

A question that could be raised is whether there are time lags between reform implementation and reform effects, specifically on the intersectoral component for which the study does not find any effects. To address this question, the baseline equation is re-estimated, replacing the annual growth of labor productivity with the five-year growth of labor productivity. The results are reported in tables S2.4 to S2.6 in the supplementary online appendix. While most of the reforms have positive and significant effects on the five-year labor productivity growth and the within component, no significant effects are found on the between component. Table 7 reports the decomposition of the effects of the different reforms on the

Table 5. Reforms and Between Component of Labor Productivity Growth

Dependent variable: Between component	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Trade reforms										
Tariffs(t−1)	−0.004									
	(0.006)									
Current_account(t−1)		0.001								
		(0.006)								
Product market reforms										
Agriculture(t−1)			0.003							
			(0.005)							
Network(t−1)				−0.003						
				(0.006)						
Financial sector reforms										
Domestic_finance(t−1)					−0.003					
					(0.006)					
Banking(t−1)						−0.003				
						(0.006)				
Securities(t−1)							−0.003			
							(0.006)			
Capital(t−1)								−0.006		
								(0.008)		
Capital_resident(t−1)									−0.003	
									(0.006)	
Capital_nonresident(t−1)										−0.006
										(0.007)
LnProd(t−1)	−0.029	−0.004	−0.014	−0.017	−0.045	−0.045	−0.045	−0.009	−0.007	−0.007
	(0.056)	(0.049)	(0.053)	(0.051)	(0.061)	(0.061)	(0.061)	(0.049)	(0.049)	(0.047)
Constant	−0.029	−0.004	−0.014	−0.017	−0.045	−0.045	−0.045	−0.009	−0.007	−0.007
	(0.056)	(0.049)	(0.053)	(0.051)	(0.061)	(0.061)	(0.061)	(0.049)	(0.049)	(0.047)
Observations	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
No. of countries	34	32	31	31	28	28	28	32	32	32
R-squared	0.081	0.079	0.079	0.078	0.075	0.075	0.075	0.081	0.080	0.082

Source: Authors' calculation.

Note: Robust standard errors cluster within countries in parentheses. All the estimations include country fixed-effects and period dummies. $^{***}p<0.01$, $^{**}p<0.05$, $^{*}p<0.1$.

five-year growth rate of labor productivity. Consistent with the previous table, most of the reforms work mainly through the within-sector effect but not through structural change. In fact, between 81 percent and 98 percent of the effect of product market and trade reforms come through the within component depending on the index of reform used. These values are 84 percent and 99 percent for the financial sector reforms.

Major vs. Minor Reform Episodes

The study further tests whether the findings discussed above vary between major and minor changes in reform indicators. In a first step, the approach consists of using a dichotomous variable equal to 1 if the value of a given reform indicator at time ***t*** in country ***i*** is higher than the country average of this reform over the sample period (1975–2005), and 0 otherwise. Second, the study creates four dummy variables, each equal to 1 if the variation between a reform indicator at time ***t*** and the country average of this reform over the sample period is higher than 5 percent, 10 percent, 20 percent, and 40 percent, respectively, and 0 otherwise. Then, the study estimates equations (3), (4), and (5). The results, reported in tables S2.10–S2.13 in the supplementary online appendix, show that there is a clear difference between major and

Table 6. Decomposition of the Effects of Reforms between the Within and Between Components (%)

	Within component	Between component	Total
Trade reforms			
Tariffs	+87.5***	|−12.5|	100
Current account	+96.4**	+3.6	100
Product market reforms			
Agriculture	+50.0	+50.0	100
Network	+88.0***	|−12.0|	100
Financial sector reforms			
Domestic_finance	+89.3***	|−10.7|	100
Banking	+88.5***	|−11.5|	100
Securities	+89.3***	|−10.7|	100
Capital	+76.9*	|−23.1|	100
Capital_resident	+76.9	|−23.1|	100
Capital_nonresident	+76.0**	|−24.0|	100

Source: Authors' calculation.
Note: Values are obtained using the estimates in tables 4 and 5. See section 4 for more information on how these values are computed. The significance levels reported correspond to the significance of the estimates on the reform variables in tables 4 and 5. ***$p<0.01$, **$p<0.05$, *$p<0.1$

Table 7. Decomposition for the Five-Year Growth of Labor Productivity (%)

	Within component	Between component	Total
Trade reforms			
Tariffs	+81***	+19	100
Current_account	+97***	+3	100
Product market reforms			
Agriculture	+98	|−2|	100
Network	+86***	+14	100
Financial sector reforms			
Domestic_Finance	+95***	+5	100
Banking	+94	+6	100
Securities	+99.5***	+0.5	100
Capital	+97***	|−3|	100
Capital_resident	+90***	+10	100
Capital_nonresident	+84***	|−16|	100

Source: Authors' calculation.
Note: Values and their significance levels are obtained using the estimates in tables S2.4 and S2.5 in the supplementary online appendix. See section 4 for more information on how these values are computed. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

minor reform episodes. Major changes in reform indicators have a higher impact on productivity growth than minor reform episodes. In line with the main findings, there is no evidence that major reforms matter for structural change. Intrasectoral allocation is still the main channel through which structural reforms affect productivity growth.

Reforms, Labor Market Rigidity, and Labor Productivity Growth

The previous findings suggest that structural reforms have no impact on the intersectoral component of labor productivity growth. The absence of impact of reforms on the intersectoral component of labor productivity growth may be explained by labor market institutions. For example, if trade liberalization allows firms to import cheaper capital and intermediates inputs, but hiring and firing costs are still high, firms will adopt more capital-intensive methods of production and favor a process of creative destruction (Pariboni and Tridico 2019), where the Schumpeterian engine of innovation generates productivity growth within sectors but not structural change due to lack of labor flexibilization. Furthermore, if

agricultural reforms improve labor productivity, one could expect an intersectoral labor movement toward modern activities[17] if there is flexibility in entry and exit into these activities. However, stringent employment protection may slow down the transition of workers to modern economic activities (Ciccone and Papaioannou 2008; Haltiwanger, Scarpetta and Schweiger 2014; Mensah et al. 2018).

This section assesses the role of labor market institutions using a new dataset on labor market rigidity, the LAMRIG (*de jure*) index (Campos and Nugent 2018). Campos and Nugent (2018) focused on the following aspects of labor market institutions: conditions of work (hours of work, weekly rest, and paid leave); employment security, termination of employment; conditions of employment (labor contracts, wages, and personnel management); and general provisions (labor codes, general labor, and employment acts).[18] The LAMRIG (*de jure*) index is available for over 140 countries, and is measured as five-year averages from 1950 to 2004. The index ranges from 0 to 3.5, with higher values indicating more rigid (less flexible) employment protection.[19]

Using the LAMRIG index, the study checks whether the effects of reforms on labor productivity growth and the intersectoral and intracomponents depend on the rigidity level in the labor market. The study tests if the effects of reforms on labor productivity growth and its subcomponents nonlinearly depend on labor market rigidity.[20] The study groups the observations in the sample in quartiles according to the labor market rigidity index. For each quartile, it estimates the baseline model.[21] The results are summarized in table 8 for the four quartiles, respectively. The *p*-values of the tests of equality of the estimates across the quartiles are reported in table 9.

The findings suggest that labor market rigidity plays an important role in how specific reforms effectively allocate resources within and across sectors. Three findings stand out. First, current account reforms have a statistically positive (negative) effect on intersectoral component in the 1st (4th) quartile. The result suggests that current account liberalization increases (reduces) productivity growth mainly through the interallocative efficiency channel if labor markets are flexible (rigid). However, tariff reforms have a statistically positive impact on the intrasectoral component in the 3rd quartile. This confirms the initial conjecture that firms in developing countries respond to trade liberalization by using labor-intensive (capital-intensive) techniques if employment conditions are flexible (rigid). Second, there is a statistically positive (negative) association between agricultural reforms and labor productivity growth and the intersectoral component in the 1st (4th) quartile. Agricultural reforms increase productivity growth in countries with more flexible labor market institutions mainly through the interallocative efficiency channel. However, when labor market institutions are too rigid, agricultural reforms reduce growth through interallocative inefficiencies. These findings may suggest that if agricultural reforms increase productivity,

17 Two hypotheses explain why improvement in agricultural productivity will lead to movement of labor out of agriculture: the labor push hypothesis and the subsistence constraint hypothesis (Üngör 2013).

18 The LAMRIG index is constructed using the International Labour Organizations's NATLEX (2012), a depository of national labor laws, social security, and human rights laws for 196 countries. They compile all information on the four categories, apply the coding scheme of Botero et al (2004) and cross-validate using other sources of labor market indices. These sources include the Heckman and Pagés (2000, 2004) index for LAC countries, the OECD labor markets index (Blanchard-Wolfers 2000), and the World Bank's Doing Business indicator of labor market rigidity, which starts from 2003.

19 Because institutions are persistent and not expected to change significantly on a yearly basis, for each year the study proxies the level of labor market rigidity with the closest five-year average that is available before the given year. For instance, for any years between 1975 and 1979, the study attributes the value of the index of 1975, and for the years in the period 2001-2005, the study assigns the value of year 2000.

20 The study also controls for the labor market rigidity index in the baseline model. The findings do not change, and the estimate on labor market rigidity is not statistically significant (see section A7 in the supplementary online appendix).

21 This method has also been applied in previous studies to test whether the effects of reforms on economic performance vary across quartiles with different levels of institutions (Prati, Onorato, and Papageorgiou (2013); and Dabla-Norris, Ho, and Kyobe 2016).

Table 8. Reforms, Labor Regulations and Labor Productivity

	Quartile 1 (High labor market flexibility)			Quartile 2 (Moderate labor market flexibility)			Quartile 3 (Moderate labor market rigidity)			Quartile 4 (High labor market rigidity)		
	Growth	Within	Between	Growth	Within	Between	Growth	Within	Between	Growth	Within	Between
Trade reforms												
Tariffs(t−1)	0.021	0.032	−0.011	−0.012	−0.002	−0.010	0.070*	0.069*	0.002	0.001	0.012	−0.011
	(0.034)	(0.028)	(0.009)	(0.028)	(0.028)	(0.013)	(0.038)	(0.034)	(0.008)	(0.015)	(0.022)	(0.008)
Current account(t−1)	0.035	0.014	0.020**	0.026	0.025	0.002	0.058	0.064**	−0.007	0.021	0.036	−0.015*
	(0.024)	(0.026)	(0.008)	(0.031)	(0.029)	(0.007)	(0.034)	(0.028)	(0.010)	(0.035)	(0.034)	(0.008)
Product market reforms												
Agriculture(t−1)	0.030***	0.005	0.025***	0.009	−0.000	0.009	0.017	0.016	0.001	−0.020**	−0.011	−0.008**
	(0.002)	(0.004)	(0.003)	(0.010)	(0.005)	(0.007)	(0.016)	(0.015)	(0.011)	(0.008)	(0.011)	(0.004)
Network(t−1)	0.077***	0.063***	0.014	0.037	0.026	0.011	0.025	0.041*	−0.015	0.005	0.019	−0.013
	(0.011)	(0.017)	(0.013)	(0.024)	(0.029)	(0.010)	(0.031)	(0.021)	(0.013)	(0.018)	(0.023)	(0.014)
Financial sector reforms												
Domestic finance(t−1)	0.064	0.058	0.006	0.033	0.035	−0.003	0.039**	0.045***	−0.005	0.010	0.024	−0.014
	(0.050)	(0.038)	(0.022)	(0.020)	(0.021)	(0.007)	(0.015)	(0.011)	(0.010)	(0.020)	(0.021)	(0.014)
Banking(t−1)	0.058	0.054	0.004	0.029	0.030	−0.001	0.031*	0.037***	−0.006	0.011	0.024	−0.013
	(0.048)	(0.038)	(0.021)	(0.018)	(0.018)	(0.006)	(0.014)	(0.009)	(0.010)	(0.020)	(0.021)	(0.013)
Securities(t−1)	0.067	0.056*	0.011	0.029	0.034	−0.005	0.065***	0.060***	0.004	−0.001	0.017	−0.019
	(0.038)	(0.027)	(0.020)	(0.020)	(0.023)	(0.006)	(0.014)	(0.012)	(0.005)	(0.016)	(0.022)	(0.014)
Capital(t−1)	0.015	0.002	0.013	−0.005	−0.005	0.000	0.028	0.038*	−0.011	0.027	0.046	−0.019
	(0.014)	(0.014)	(0.012)	(0.015)	(0.015)	(0.009)	(0.024)	(0.018)	(0.010)	(0.029)	(0.041)	(0.013)
Capital resident(t−1)	0.007	0.001	0.006	−0.009	−0.004	−0.005	0.028	0.035*	−0.008	0.019	0.029	−0.011
	(0.015)	(0.013)	(0.012)	(0.017)	(0.019)	(0.010)	(0.025)	(0.019)	(0.010)	(0.028)	(0.033)	(0.009)
Capital nonresident1)	0.020	0.003	0.017*	0.002	−0.002	0.004	0.022	0.033**	−0.011	0.022	0.042	−0.019
	(0.014)	(0.013)	(0.009)	(0.011)	(0.011)	(0.006)	(0.018)	(0.013)	(0.009)	(0.021)	(0.030)	(0.012)

Source: Authors' calculation.

Note: These results are obtained using the baseline model. The quartiles are defined using the *de jure* index of labor market rigidity. The reforms variables are introduced in the models one by one. Robust standard errors cluster within countries in parentheses. All the estimations include country fixed-effects and period dummies. ***$p<0.01$, **$p<0.05$, *$p<0.1$.

Table 9. Values for the Test of Equality of the Effect of Reforms across Labor Rigidity Quartiles

	Labor productivity Growth	Within component	Between component
Trade reforms			
Tariffs	0.3108	0.3911	0.6266
Current account	0.8728	0.5874	0.0236**
Product market reforms			
Agriculture	0.000***	0.3638	0.000***
Network	0.0081***	0.3971	0.1965
Financial sector reforms			
Domestic finance	0.5992	0.8112	0.831
Banking	0.7675	0.8814	0.8234
Securities	0.0293**	0.3962	0.3083
Capital	0.5738	0.2338	0.288
Capital resident	0.6347	0.3748	0.6776
Capital nonresident	0.6564	0.1839	0.0658*

Source: Authors' calculation.

Note: This table reports for labor productivity growth and its subcomponents, the *p*-values of the tests of equality of the effects of each reforms across the four quartiles of labor productivity rigidity. Results of the estimated effects of reforms across the quartiles can be found in table 8. ***$p<0.01$, **$p<0.05$, *$p<0.1$

fewer workers are required in the agricultural sector to produce the minimum subsistence consumption. Consequently, the surplus of labor tends to move towards sectors with above-average (below-average) productivity if labor market institutions are flexible (rigid), generating efficient (inefficient) effects.[22]

Finally, financial sector reforms affect productivity growth mostly through the within effect only in the 3rd quartile. The results seem to suggest that firms in developing countries respond to financial reforms well when employment conditions are moderately rigid. Firms may respond to positive shocks due to financial reforms by introducing innovation or increasing the investment in (existing) human capital that pays off in productivity growth. Plausibly, when hiring and firing costs are moderately high, firms are likely to respond to financial opportunities by investing in new technology (capital deepening) rather than by employing new workers.

6. Conclusion

It is widely recognized that productivity is an important determinant of countries' economic performance in the long run. Understanding which policies raise productivity growth in developing countries is essential, given the low level of productivity and a limited number of studies. This paper adds to the limited literature on the impacts of structural reforms on productivity growth in developing countries. It draws lessons on how trade, product market, and financial sector reforms implemented during the period 1975–2005 affected differences in cross-country aggregate labor productivity growth. The paper pays particular attention to how the effects of reforms on labor productivity growth is distributed between the intrasectoral (within) and intersectoral (between or structural change) components of labor productivity growth. The empirical analysis combines the dataset on structural reforms from Prati Onorato, and Papageorgiou (2013) with a sectoral database from GGDC 10-sector database and EASD. The analysis shows that most trade, product market (except agriculture reform), and financial sector reforms have significant effects on the growth rate of labor productivity. However, results show that reforms affect growth in developing countries mostly by inducing within-sector productivity growth but not structural change, helping to

22 The hypothesis that the effect of agricultural reform on productivity growth is equal across the quartiles is statistically rejected at the 1 percent significance level. The same results hold for the effect of agricultural reform on the between component across the quartiles.

explain why many developing countries had structural adjustments programs without structural change (Page 2012).

The paper takes a step further to examine why reforms have had so little impact on structural change. It hypothesizes that the effect of reforms on structural change may be shaped by nonlinearities between reforms and intermediating factors such as labor institutions. The study tests whether the effects of reforms on structural change nonlinearly depend on labor market rigidity. The results show that labor markets institutions somewhat matter for how specific reforms induce reallocation of resources within and across sectors. Perhaps one of the most striking results is that real sector reforms—agriculture and current account reforms—significantly increase (reduce) structural change if labor markets are flexible (rigid).

In theory, land institutions may also matter for intersectoral reallocation of labor. For example, it is expected that agricultural price reforms improve price incentives, affecting farm profitability, inducing a supply response, and hence productivity growth and sometimes agricultural commercialization if the land tenure system permits. While the immediate supply response generates productivity growth within the agricultural sector, the commercialization of production, which often involves mechanization and adoption of new farming technologies, rapidly increases agricultural productivity. Since agricultural productivity is inversely related with the share of the labor force in agriculture, agricultural commercialization may reduce the number of people employed in the agricultural sector, inducing an intersectoral movement of labor. Unfortunately, the study did not find data on land institutions to test whether the effect of agricultural reforms on structural change nonlinearly depend on land institutions. Having said that, the study does not view this as a drawback of this paper because the intermediating role of land institutions may only apply to agricultural reforms.

The results carry important implications for policy and measurement of reforms, and they suggest a number of research avenues. The analysis suggests that market-oriented reforms alone will not be able to deliver structural change in developing countries. Therefore, there is a prima facie rationale for complementary labor markets and industrial policies. The analysis in this paper also suggests a number of future research avenues. Most of the reform indicators are narrowly defined. For example, agricultural reform covers the markets of each country's main agricultural commodity exports. This sector may have no or only limited linkages with other sectors of the economy; therefore the agricultural reform indicator in this research may not be relevant beyond the leading commodity sector. The trade reform indicator also does not cover nontariff barriers. Given that different indicators of trade openness are uncorrelated (Pritchett 1996), moving beyond tariffs may have some implications for future analysis. Broadening the reform measures—for example, broadening agriculture reforms to include agricultural land reforms—and examining how they may affect labor productivity growth, but also its components, is an important area for future research.

References

Abiad, A., D. Enrica, and T. Thierry. 2008. "A New Database of Financial Reforms." *IMF Staff Papers* 57 (2): 281–302.

Acemoglu, D., U. Akcigit, H. Alp, N. Bloom, and W. Kerr. 2018. "Innovation, Reallocation, and Growth." *American Economic Review* 108 (11): 3450–3491.

Adamopoulos, T., and D. Restuccia. 2019. "Land Reform and Productivity: A Quantitative Analysis with Micro Data." Working paper 25780. National Bureau of Economic Research. Cambridge, MA, USA.

Aghion, P., R. Blundell, R. Griffith, P. Howitt, and S. Prantl. 2009. "The Effects of Entry on Incumbent Innovation and Productivity." *Review of Economics and Statistics* 91 (1): 20–32.

Aghion, P., M. Braun, and J. Fedderke. 2008. "Competition and Productivity Growth in South Africa." *Economics of Transition* 16 (4): 741–768.

Aghion, P., R. Blundell, R. Griffith, and P. Howitt. 2005. "Competition and Innovation: An Inverted-U Relationship." *Quarterly Journal of Economics* 120 (2): 701–728.

Amiti, M., and J. Konings. 2007. "Trade Liberalization, Intermediate Inputs, and Productivity: Evidence from Indonesia." *American Economic Review* 97 (5): 1611–1638.

Arellano, M., and S. Bond. 1991. "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations." *Review of Economic Studies* 58 (2): 277–297.

Arnold, J. M., B. Javorcik, M. Lipscomb, and A. Mattoo. 2016. "Services Reform and Manufacturing Performance: Evidence from India." *Economic Journal* 126 (590): 1–39.

Bai, J. (Jianqiu), D. Carvalho, and G. M. Phillips. 2018. "The Impact of Bank Credit on Labor Reallocation and Aggregate Industry Productivity." *Journal of Finance* 73 (6): 2787–2836.

Bartelsman, E., J. Haltiwanger, and S. Scarpetta. 2013. "Cross-Country Differences in Productivity: The Role of Allocation and Selection." *American Economic Review* 103 (1): 305–334.

Blanchard, O., and J. Wolfers. 2000. "The Role of Shocks and Institutions in the Rise of European Unemployment: The Aggregate Evidence," *Economic Journal* 110: 1–33.

Botero, J., S. Djankov, R. La Porta, F. Lopez-de-Silanes, and A. Shleifer 2004. "The Regulation of Labor." *Quarterly Journal of Economics* 119: 1339–1382.

Bourlès, R., G. Cette, J. Lopez, J. Mairesse, and G. Nicoletti. 2013. "Do Product Market Regulations in Upstream Sectors Curb Productivity Growth? Panel Data Evidence for OECD Countries." *The Review of Economics and Statistics* 95 (5): 1750–1768.

Buera, F. J., J. P. Kaboski, and Y. Shin. 2011. "Finance and Development: A Tale of Two Sectors." *American Economic Review* 101(5): 1964–2002.

Campos, N., and J. Nugent. 2018. "The Dynamics of the Regulation of Labour in Developing and Developed Countries since 1960." In *The Political Economy of Structural Reforms in Europe*. Edited by N. F. Campos, P. De Grauwe, and Y. Ji, 75–88. Oxford University Press.

Casu, B., A. Clare, A. Sarkisyan, and S. Thomas. 2013. "Securitization and Bank Performance." *Journal of Money Credit and Banking* 45 (8): 1617–1658.

Cheremukhin, A., M. Golosov, S. Guriev, and A. Tsyvinski. 2017. "The Industrialization and Economic Development of Russia through the Lens of a Neoclassical Growth Model." *Review of Economic Studies* 84: 613–649.

Ciccone, A., and E Papaioannou. 2008. "Entry Regulation and Intersectoral Reallocation." Economics Working Papers 1353. Department of Economics and Business. Universitat Pompeu Fabra. Barcelona, Catalonia, Spain.

Dabla-Norris, E., G. Ho, and A. Kyobe. 2016. "Structural Reforms and Productivity Growth in Emerging Market and Developing Economies." Working Papers WP/16/15. International Monetary Fund. Washington, DC, USA. 1–35.

De Loecker, J., J. Eechout, and G. Unger. 2020. "The Rise of Market Power and the Macroeconomic Implications." *Quarterly Journal of Economics* 135 (2): 561–644.

de Vries, G. J., M. Timmer, and K. de Vries. 2015. "Structural transformation in Africa : Static gains, dynamic losses." *Journal of Development Studies* 51 (6): 674–688.

Duarte, M., and D. Restuccia. 2010. "The Role of the Structural Transformation in Aggregate Productivity." *Quarterly Journal of Economics* 125 (1): 129–173.

ElFayoumi, K., A. Ndoye, S. Nadeem, and G. Auclair. 2018. "Structural Reforms and Labor Reallocation: A Cross-Country Analysis." Working Papers WP/18/64. International Monetary Fund. Washington, DC, USA.

Eslava, M., J. Haltiwanger, A. Kugler, and M. Kugler. 2004. "The Effects of Structural Reforms on Productivity and Profitability Enhancing Reallocation: Evidence from Colombia." *Journal of Development Economics*75 (2): 333–371.

Fabricant, S. 1942. *Employment in Manufacturing 1899–1939*. New York: National Bureau of Economic Research.

Fisman, R., and I. Love. 2004. "Financial Development and Intersectoral Allocation: A New Approach." *Journal of Finance* 59 (6): 2785–2807.

Foster-McGregor, N., and B. Verspagen. 2016. "The Role of Structural Change in the Economic Development of Asian Economies." *Asian Development Review* 33(2): 74–93.

Galindo, A., F. Schiantarelli, and A. Weiss. 2007. "Does Financial Liberalization Improve the Allocation of Investment? Micro-Evidence from Developing Countries." *Journal of Development Economics* 83 (2): 562–587.

Gollin, D. 2009. "Agricultural Productivity and Economic Growth." In *Handbook of Agricultural Economics*, Vol. 4. Edited by R. Evenson and P. Pingali, 3825–3866. New York: Elsevier B.V.

Gollin, D., D. Lagakos, and M. E. Waugh. 2014. "The Agricultural Productivity Gap." *Quarterly Journal of Economics* 129 (2): 939–993.

Graham, M.. 1996. "Financial Repression, Interest Rates, and Credit Allocation in Sub-Saharan Africa." Working Paper. Helsinki, Finland, RIP 6.

Grossman, G. M., and E. Helpman. 1991. *Innovation and Growth in the Global Economy*. Cambridge, MA: MIT Press.

Haltiwanger, J., S. Scarpetta, and H. Schweiger. 2014. "Cross Country Differences in Job Reallocation: The Role of Industry, Firm Size and Regulations." *Labour Economics* 26 (116): 11–25.

Heckman, J., and C. Pagés, eds. 2004. *Law and Employment: Lessons from Latin America and the Caribbean*. Chicago: University of Chicago Press.

Holmes, T. J., and J. A. Schmitz. 2010. "Competition and Productivity: A Review of Evidence." *Annual Review of Economics* 2 (1): 619–642.

Hopenhayn, H. A. 2014. "Firms, Misallocation, and Aggregate Productivity: A Review." *Annual Review of Economics* 6 (1): 735–770.

Hsieh, C.-T., and P. J. Klenow. 2009. "Misallocation and Manufacturing TFP in China and India." *Quarterly Journal of Economics* 124 (4): 1403–1448.

Kherallah, M., C. Delgado, E. Gabre-Madhin, N. Minot, and M. Johnson. 2000. "The Road Half Traveled: Agricultural Market Reform in Sub-Saharan Africa." Food Policy Report IFPRI. International Food Policy Research Institute. Washington, DC, USA.

Kouamé, W. A. K., and S. J. A. Tapsoba. 2019. "Structural Reforms and Firms' Productivity: Evidence from Developing Countries." *World Development* 113 (2019): 157–171.

Larrain, M., and S. Stumpner. 2017. "Capital Account Liberalization and Aggregate Productivity : The Role of Firm Capital Allocation." *Journal of Finance* 72 (4): 1825–1858.

Levine, R. 1997. "Financial Development and Economic Growth: Views and Agenda." *Journal of Economic Literature* 35 (2):688–726.

Levine, R. 1999. "Law, Finance, and Economic Growth." *Journal of Financial Intermediation*, 8, 8–35.

McCaig, B., and N. Pavcnik. 2018. "Export Markets and Labor Allocation in a Low-Income Country." *American Economic Review* 108 (7): 1899–1941.

McKinnon, R. I., and H. Pill. 1998. "International Overborrowing: A Decomposition of Credit and Currency Risks." *World Development* 26 (7): 1267–1282.

McMillan, M., D. Rodrik, and I. Verduzco-Gallo. 2014. "Globalization, Structural Change, and Productivity Growth, with an Update on Africa." *World Development* 63: 11–32.

McMillan, M. S., and D. Rodrik. 2011. "Globalization, Structural Change and Productivity Growth." Working Paper 17143. National Bureau of Economic Research. Cambridge, MA, USA.

Melitz, M. J. 2003. "Impact of Trade on Intra-Industry Reallocations and Industry Aggregate Productivity." *Econometrica* 71 (6): 1695–1725.

Mensah, E. B., S. Owusu, N. Foster-Mcgregor, and A. Szirmai. 2018. "Structural Change, Productivity Growth and Labor Market Turbulence in Africa." GGDC Research Memorandum 179. Groningen Growth and Development Center. University of Groningen. Groningen, The Netherlands.

Mensah, E. B., and A. Szirmai. 2018. "Africa Sector Database: Expansion and Update." UNU-MERIT Working Paper Series, #2018-020. UNU-WIDER, Helsinki. Maastricht, The Netherlands. 1–48.

NATLEX. 2012. "International Labour Organization," www.natlex.ilo.org.

Nicodeme, G., and J.-B. Sauner-Leroy. 2007. "Product Market Reforms and Productivity: A Review of the Theoretical and Empirical Literature on the Transmission Channels." *Journal of Industry, Competition and Trade* 7: 53–72.

Obstfeld, M. 1994. "Risk-Taking, Global Diversification, and Growth." *American Economic Review* 84 (5): 1310–1329.

Page, J. 2012. "Can Africa Industrialise?" *Journal of African Economies* 21 (SUPPL.2): ii86–ii125.

Pariboni, R., and P. Tridico. 2019. "Structural Change, Institutions and the Dynamics of Labor Productivity in Europe." *Journal of Evolutionary Economics*. https://doi.org/10.1007/s00191-019-00641-y.

Pavcnik, N. 2002. "Trade Liberalization, Exit, and Productivity Improvements : Evidence from Chilean Plants." *Review of Economic Studies* 69 (1): 245–276.

Prati, A., M. G. Onorato, and C. Papageorgiou. 2013. "Which Reforms Work and under What Institutional Environment? Evidence from a New Data Set on Structural Reforms." *Review of Economics and Statistics* 95 (3): 946–968.

Pritchett, L. 1996. "Measuring outward orientation in LDCs: Can it be done?" *Journal of Development Economics*, 49(2): 307–335.

Restuccia, D., and R. Rogerson. 2008. "Policy Distortions and Aggregate Productivity with Heterogeneous Establishments." *Review of Economic Dynamics*. https://doi.org/10.1016/j.red.2008.05.002.

Restuccia, D., and R. Rogerson. 2017. "The Causes and Costs of Misallocation." *Journal of Economic Perspectives* 31 (3): 151–174.

Rodrik, D. 1998. "Who Needs Capital Account Convertibility?" *Princeton Essays in International Finance* 207: 55–65.

Schumpeter, J. 1912. *Theory of Economic Development,* trans. 1934. Cambridge, MA: Harvard University Press.

Timmer, M. P., G. J. de Vries, and K. de Vries. 2014. "Patterns of Structural Change in Developing Economies." *GGDC Research Memorandum No. 149*. Groningen: Groningen Growth and Development Centre.

Timmer, M., G. J. de Vries, and K. de Vries. 2015. "Patterns of Structural Change in Developing Countries." In *Routledge Handbook of Industry and Development*. Edited by J. Weiss and M. Tribe, 79–97. Abingdon-on-Thames, UK: Routledge.

Topalova, P., and A. Khandelwal. 2011. "Trade Liberalization and Firm Productivity: The Case of India." *Review of Economics and Statistics* 93 (3): 995–1009.

Üngör, M. 2013. "De-agriculturalization as a Result of Productivity Growth in Agriculture." *Economics Letters* 119: 141–145.

Wacziarg, R., and J. S. Wallack. 2004. "Trade Liberalization and Intersectoral Labor Movements." *Journal of International Economics* 64 (2): 411–439.

World Bank. 1981. *Accelerated Development in Sub-Saharan Africa:An Agenda for Action*. Washington. DC: World Bank.

Wurgler, J. 2000. "Financial Markets and the Allocation Of Capital." *Journal of Financial Economics* 58 (1–2): 187–214.