Reforms and labor productivity in developing countries: Is structural change ignored?

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Outline

1. Motivation, Literature and contribution

2. Data Description

3. Methodology and Results

4. Concluding Remarks

Motivation

▶ Parts of developing countries: labor productivity relatively low (Macmillan et al(2014)), heterogeneity across regions

▶ Drivers of labor productivity growth: Education; Capital investments; Structure of the private sector

▶ Structural reforms also matter:
  ▶ Help remove obstacles to an efficient relocation of resources
  ▶ Reduce rigidities in product and factor markets, liberalize capital flows, and free international trade
    ▶ Boosting income and per capita economic growth ((Bekaert et al(2005); Prati el al(2013))

▶ Which structural reforms help increase labor productivity growth in developing countries?

▶ Do reforms provide an efficient relocation of labor from low to high labor productivity growth sectors?

Related Literature

1. Reforms, income and economic performance
   - Trade liberalization, financial and product reforms increase income and economic growth Franket and Romer(1999); Sachs and Warner(1995); Dollar Graay (2004); (Bekaert et al(2005); Nicoletti and Scarpetta(2003))
       - Mostly in developed countries; little about reforms and economic performance in less advanced countries
   - Pati et al(2013): New dataset on reforms for developed and developing countries (annual dataset from 1970-2005)
       - Reforms matter for economic growth, quality of institutions, distance to the frontier, etc..
   - We add in the mechanisms through labor productivity growth and its components

Related literature

2. Reforms and labor productivity

▶ Firm level analysis in developing and emerging countries

  ▶ Topalova and Khandelwal (2011), Bas (2014), Arnold, Javorcik, Lipscom and Mattoo (2015) – Eslava, Haltiwange, Kugler, Kugler (2004) – Bas and Causa (2013) – Amiti and Konings (2007) – Cuervo-Cazurra, and Dau (2009)
  ▶ Kouam and Tapsoba (2019): low and middle income countries
  ▶ Tressel (2008): industry level in 91 countries

▶ Short time period

▶ Dabla-Norris, Ho, and Kyobe (2016) - Emerging market and developing economies: Productivity impact of reforms depends on the distance to the global technology frontier

Contribution

1. Explore the impacts of real and financial sector reforms on annual growth rate of labor productivity (1975-2005)

   ▶ Investigate the mechanism through:
      ▶ Within component: growth rate within the sectors
      ▶ Between (or structural change) component: growth rate from the movement of labor across sectors

2. Reforms and labor productivity by sub-sectors (Agriculture, manufacture and non-manufacture industries; market and non-market services)

3. Does closeness to technological frontier matter?

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Data

Data

- 10-sector database from the Groningen Growth and Development Center and the Expanded Africa Sector Database (EASD) by Mensah and Szirmai (2018)

- Reforms indexes from Prati et al (2013) covering more than 90 countries other the period 1975-2005

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Measuring labor productivity growth

▶ **Aggregate labor productivity** - Sum of the product of sectoral productivity and employment weight of the different sectors

$$q_t = \sum_i q_{it} s_{it}, \;\; where \;\; q_{it} = \frac{Q_{it}}{l_{it}}$$

$$\overbrace{\frac{\Delta q}{q^{t-1}}}^{LPG} = \frac{q_t - q_{t-1}}{q_{t-1}}$$

▶ **Decomposition** - use variant forms of the shift-and-share method in Rodrik and Mcmillan (2011); Mcmillan and Verduzco-Gallo (2014)

$$\overbrace{\frac{\Delta q}{q^{t-1}}}^{LPG} = \underbrace{\sum_{i=1}^{N} \Big[\frac{q_i^t - q_i^{t-1}}{q^{t-1}}\Big] s_i^{t-1}}_{within \; effect} + \overbrace{\sum_{i=1}^{N} \Big[\frac{(s_i^t - s_i^{t-1})q_i^t}{q^{t-1}}\Big]}^{between \; effect}$$

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Real sector reforms

- ▶ Openness to trade

    - ▶ **Trade**: Average tariff rates on trade
    - ▶ **Current account**: Restrictions on current account transactions (including payments and receipts on exports and imports of goods and services)

- ▶ Product market reforms

    - ▶ **Agriculture**: The extent of public intervention in the market of each country's main agricultural export commodity

    - ▶ **Network**: Degree of liberalization in the telecommunications and electricity markets, including the extent of competition in the provision of these services and the existence of an independent regulator.

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Financial sector reforms

▶ Domestic financial reforms

1. **Banking system reforms** - (i) credit controls accounting for subsidies lending and directed credit, (ii) interest rate controls such as floors and ceilings, (iii) competition restrictions related to entry barriers and limits on branches, (iv) the importance of state ownership, (v) the quality of banking supervision and regulation
2. **Securities sector reforms** - the degree of legal restrictions on the development of domestic bonds and equity markets and the existence of independent regulators

External capital account liberalization

▶ Measures a broad set of restrictions on financial transactions for (i) residents and (ii) nonresidents, as well as the use of multiple exchange rates

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Estimations

Empirical Methodology

- **Fixed effect model**

  - **Estimation models**

    $$LPG_{it} = \alpha_0 + \alpha_1 Reforms_{ri,(t-1)} + \alpha_2 X_{ict} + \delta_t + \eta_i + \vartheta_{it}$$

    $$Within_{it} = \beta_0 + \beta_1 Reforms_{ri,(t-1)} + \beta_2 X_{ict} + \delta_t + \eta_i + \varepsilon_{it}$$

    $$Between_{it} = \gamma_0 + \gamma_1 Reforms_{ri,(t-1)} + \gamma_2 X_{ict} + \delta_t + \eta_i + \zeta_{it}$$

  - Country and year fixed effect; standard errors clustered at the country level

  - **Control variables**: Level of development, growth of the population rate, endowment in human, physical and natural resources, quality of institutions

  - GMM estimations as robustness checks

Reforms and labor productvity growth

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real sector										
Trade(t-1)	0.024[b]									
	(0.011)									
CurrentAc(t-1)		0.028[b]								
		(0.013)								
Agric(t-1)			0.005							
			(0.009)							
Network(t-1)				0.019[b]						
				(0.008)						
Financial										
DomesticFin(t-1)					0.022[b]					
					(0.009)					
Banking(t-1)						0.020[b]				
						(0.009)				
Securities(t-1)							0.022[a]			
							(0.008)			
Capital(t-1)								0.014		
								(0.010)		
CapitalRes(t-1)									0.007	
									(0.009)	
CapitalNonres(t-1)										0.013
										(0.008)
LNProd(t-1)	-0.066[a]	-0.040[b]	-0.032	-0.024	-0.040[a]	-0.039[a]	-0.040[a]	-0.037[b]	-0.036[b]	-0.036[b]
	(0.015)	(0.018)	(0.019)	(0.016)	(0.012)	(0.012)	(0.013)	(0.016)	(0.017)	(0.016)
Constant	0.661[a]	0.393[b]	0.326	0.242	0.400[a]	0.395[a]	0.401[a]	0.373[b]	0.367[b]	0.367[b]
	(0.146)	(0.178)	(0.199)	(0.164)	(0.122)	(0.121)	(0.136)	(0.166)	(0.172)	(0.167)
Obs	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
R2	0.193	0.161	0.163	0.128	0.152	0.152	0.154	0.154	0.152	0.154
Country	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Time	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

standard errors clustered at the country level. a:1%; b: 5% and c:10% significance levels

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Estimations

Reforms and within component

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real sector										
Trade(t-1)	0.028^a									
	(0.010)									
CurrentAc(t-1)		0.027^b								
		(0.011)								
Agric(t-1)			0.003							
			(0.007)							
Network(t-1)				0.022^a						
				(0.008)						
Financial										
DomesticFin(t-1)					0.025^a					
					(0.008)					
Banking(t-1)						0.023^a				
						(0.008)				
Securities(t-1)							0.025^a			
							(0.008)			
Capital(t-1)								0.020^c		
								(0.010)		
CapitalRes(t-1)									0.010	
									(0.008)	
CapitalNonres(t-1)										0.019^b
										(0.009)
LNProd(t-1)	-0.069^a	-0.040^b	-0.033	-0.025	-0.044^a	-0.043^a	-0.044^a	-0.038^b	-0.036^c	-0.037^b
	(0.015)	(0.019)	(0.021)	(0.017)	(0.012)	(0.012)	(0.013)	(0.017)	(0.018)	(0.017)
Const	0.690^a	0.397^b	0.340	0.259	0.445^a	0.440^a	0.446^a	0.381^b	0.374^b	0.374^b
	(0.147)	(0.187)	(0.212)	(0.171)	(0.125)	(0.123)	(0.136)	(0.173)	(0.181)	(0.173)
Obs	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
R2	0.196	0.162	0.164	0.131	0.165	0.164	0.166	0.157	0.155	0.157
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

standard errors clustered at the country level. a:1%; b: 5% and c:10% significance levels

Reforms and between component

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Real Sector										
Trade(t-1)	-0.004									
	(0.006)									
CurrentAc(t-1)		0.001								
		(0.006)								
Agri(t-1)			0.003							
			(0.005)							
Network(t-1)				-0.003						
				(0.006)						
FinancialSector										
DomesticFin(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)		
CapitalRes(t-1)									-0.003	
									(0.006)	
CapitalNonres(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)
Obs	1,025	1,075	1,034	1,051	913	913	913	1,075	1,075	1,075
R2	0.081	0.079	0.079	0.078	0.075	0.075	0.075	0.081	0.080	0.082
Country FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Period FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES

standard errors clustered at the country level. a:1%; b: 5% and c:10% significance levels

Within and between effect Contributions

	Within component	Between component
Real sector reforms		
Trade	$+87.5^a$	-12.5
Current Account	$+96.4^b$	$+3.6$
Agriculture	$+50.0$	$+50.0$
Network	$+88.0^a$	-12.0
Financial sector reforms		
Domestic_finance	$+89.3^a$	-10.7
Banking	$+88.5^a$	-11.5
Securities	$+89.3^a$	-10.7
Capital	$+76.9^c$	-23.1
Capital resident	$+76.9$	-23.1
Capital non resident	$+76.0^b$	-24.0

Reforms and labor productivity growth within sector

- ▶ Positive reforms on service sector
  - ▶ Stronger effect for market services than non-market services

- ▶ Positive effect on industry sector

  - ▶ Stronger effects on non-manufacture than manufacture industry

- ▶ Positive effect on agriculture sector

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└─ Estimations

Distance to the frontier

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Front	-0.797^a	-0.381^c	-0.469	-0.357	-0.529^a	-0.527^a	-0.515^a	-0.383	-0.420^c	-0.376
	(0.180)	(0.206)	(0.279)	(0.217)	(0.139)	(0.140)	(0.135)	(0.226)	(0.228)	(0.239)
Trade	0.138									
	(0.091)									
Front*Trade	-0.154									
	(0.111)									
Cur		0.313^a								
		(0.110)								
Front*Cur		-0.361^a								
		(0.128)								
Agri			0.124							
			(0.086)							
Front*Agri			-0.152							
			(0.097)							
Net				0.152						
				(0.243)						
Front*Net				-0.165						
				(0.280)						
Domes					0.279^a					
					(0.087)					
Front*Domes					-0.322^a					
					(0.103)					
Bank						0.255^a				
						(0.083)				
Front*Bank						-0.297^a				
						(0.098)				
Secu							0.338^a			
							(0.097)			
Front*Secu							-0.380^a			
							(0.113)			
Capi								0.282		
								(0.209)		
Front*Cap								-0.332		
								(0.241)		
Capitres									0.196	

Distance to the technological frontier

► Close to the technological frontier:

  ► Reduces the effects of reforms on labor productivity growth

  ► Reduces the effects of reforms on the within component

  ► Little evidence on the between component

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Conclusion

Concluding remarks

- ▶ Examine the effects of real and financial sector reforms on labor productivity growth

- ▶ Explore the mechanisms through the growth rate within the sectors and through the movement of labor across the sectors

- ▶ Financial and real sector reforms increase labor productivity growth in developing countries

- ▶ Mainly through growth within the sectors

- ▶ Reforms were "not well targeted enough" toward an efficient relocation of labor from less to more productive sectors

- ▶ More effective reforms would take into account factors that may help workers to move to more productive sectors

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└─ Conclusion

Thank you very much for your attention!!!!

Mean Annual Labor Productivity Growth by Region (%), 1975-2005

Region	Within	Between	LP Growth	LP Growth(SD)
Africa	0.7	0.7	1.4	6.5
Asia	2.8	0.6	3.4	4.3
Latin America	-0.8	0.7	-0.1	4.8
MENA	1.5	0.7	2.2	5.2