

# LABOUR REALLOCATION, INFORMALITY AND PRODUCTIVITY GROWTH IN BRICs\*

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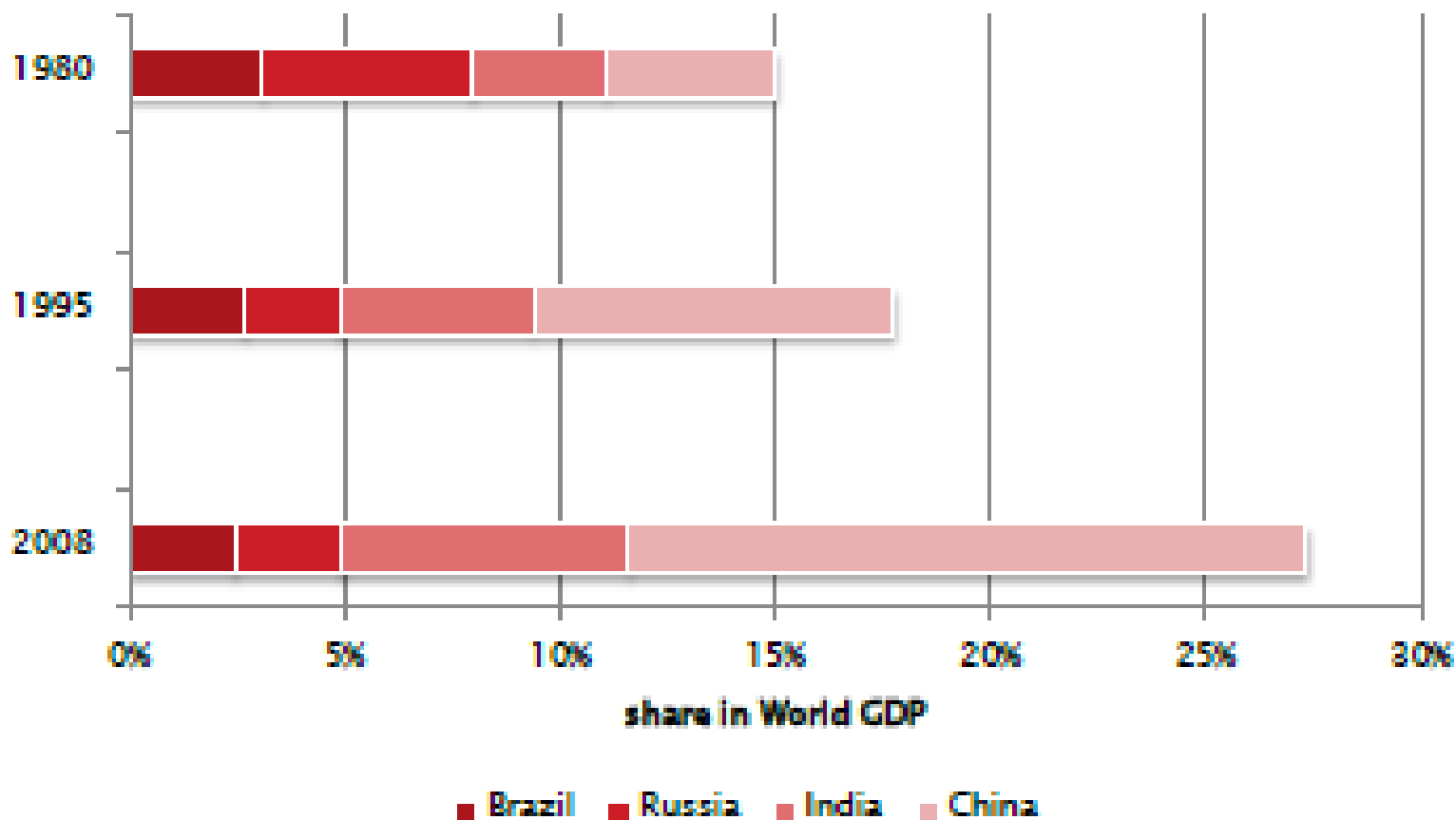
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\*Updated version of G. de Vries, A.A. Erumban, M.P.Timmer, I.Voskoboynikoy, H.X.  
Wu, 2012, Deconstructing the BRICs: Structural Transformation and Economic  
Growth”

- ✘ Structural change, narrowly defined as the reallocation of labor across sectors, featured prominently in the early analysis of economic growth (e.g. by Kuznets, 1966)
- ✘ The best documented pattern of structural change is the shift of labor and capital from production of primary goods to manufacturing and services
- ✘ Growth rate of productivity is different across sectors, reflecting differences in the nature of the production function, in investment opportunities and in the rate of technical change (Syrquin 1984; Crafts 1984)
- ✘ These differences in the potential for structural change featured prominently in explanations of differential growth within European countries in the post-WW-II period (Dennison 1967; Maddison 1987; Timmer et al. 2010)
- ✘ However, little is known about the development pattern that underlies aggregate progress in the BRIC countries

**DEVELOPMENT ENTAILS STRUCTURAL CHANGE...**



Note: GDP expressed in 2005 EKS PPPs.

Source: Total Economy Database (GGDC and the Conference Board)

## THE BRICs AROUND THE WORLD

1. A harmonized time-series database of value added and persons engaged by sector with a common industry classification

Based on a critical assessment of the reliability, consistency, as well as the concepts and definitions used in various primary data sources

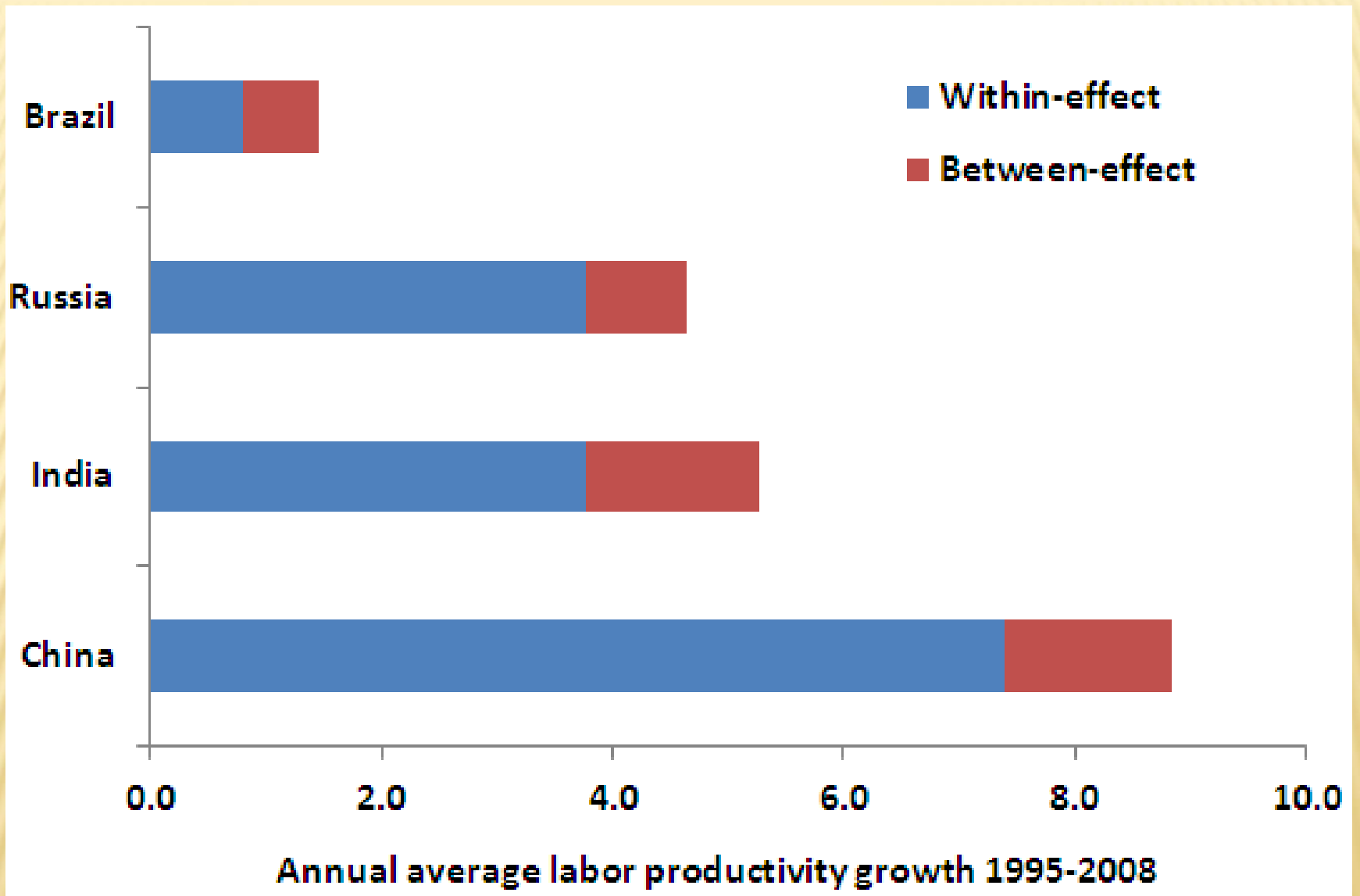
2. For Brazil, India and Russia we are able to split sectoral GDP and employment into formal and informal sectors

Disclaimer: definitions of the informal sector differ between Brazil and India, and the data quality regarding informal sector development patterns is subject to larger uncertainty

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**THIS PAPER (NOVELTY)**

- Fabricant (1942)
- (1)  $\Delta P = \sum_i \Delta P_i \bar{L}_i + \sum_i \Delta L_i \bar{P}_i = \sum_i \Delta P_i \bar{L}_i + R$
- with  $\bar{L}_i$  the average share of sector  $i$  in overall employment, and  $R$  the reallocation term.
- (2)  $\Delta P_i = \sum_{j \in i} \Delta P_j \bar{L}_{i,j} + R_i$
- where  $\bar{L}_{i,j}$  is the average share of subsector  $j$  in sector  $i$  employment
- (3)  $\Delta P = \sum_j (\Delta P_j \bar{L}_j) + (\sum_j R_j \bar{L}_j + R)$
- Important shortcoming: all expanding sectors contribute positively to aggregate productivity growth, even when they have below-average productivity levels.



## AGGREGATE DECOMPOSITION RESULTS, 1995-2008

	1995-2008	1995-2008	1980-1995	1980-1995
	3-sector	35-sector	3-sector	35-sector
Contribution of productivity growth in:				
Agriculture	0.3	0.3	0.2	0.2
Industry	0.2	0.2	-0.2	-0.2
Services	0.1	0.5	-2.0	-1.6
All sectors (1)	0.6	1.0	-2.0	-1.6
Reallocation (2)	0.6	0.1	1.1	0.8
Aggregate productivity growth (3) = (1) +(2)	1.1	1.1	-0.9	-0.9

## STRUCTURAL CHANGE AND AGR. PRODUCTIVITY GROWTH: BRAZIL

	1995-2008	1995-2008
	4-sector	35-sector
Contribution of productivity growth in:		
Agriculture	0.2	0.2
Mining & Wholesale trade	0.4	0.3
Industry	1.3	1.2
Services	1.9	1.8
All sectors (1)	3.8	3.5
Reallocation (2)	0.8	1.1
Aggregate productivity growth (3) = (1) +(2)	4.5	4.5

## **STRUCTURAL CHANGE AND AGGR. PRODUCTIVITY GROWTH: RUSSIA**



	1991- 2008	1991- 2008	1981- 1991	1981- 1991
	3-sector	31-sector	3-sector	31-sector
Contribution of productivity growth in:				
Agriculture	0.5	0.5	0.5	0.5
Industry	0.9	1.0	0.5	0.2
Services	2.5	1.9	1.1	0.8
All sectors (1)	3.8	3.4	2.1	1.5
Reallocation (2)	0.9	1.3	0.9	1.4
Aggregate productivity growth (3) = (1) +(2)	4.7	4.7	3.0	3.0

## STRUCTURAL CHANGE AND AGGR. PRODUCTIVITY GROWTH: INDIA

	1997-2008	1997-2008	1987-1997	1987-1997
	3-sector	35-sector	3-sector	35-sector
Contribution of productivity growth in:				
Agriculture	0.6	0.6	0.9	0.9
Industry	4.4	4.6	4.6	4.5
Services	2.5	2.6	1.2	1.5
All sectors (1)	7.5	7.9	6.7	6.8
Reallocation (2)	1.2	0.8	1.0	0.9
Aggregate productivity growth (3) = (1) +(2)	8.7	8.7	7.7	7.7

## STRUCTURAL CHANGE AND AGGR. PRODUCTIVITY GROWTH: CHINA

Definitions of the informal sector vary:

- India: based on an employment size threshold, where the organized sector consists of firms employing 10 or more workers using power, and 20 or more workers without using power
- Information on NDP from national account statistics, employment from NSSO surveys
- Brazil: informal employment defined according to contract status. Also, autonomous workers, comprising own-account workers and employers of unregistered firms are considered part of the informal sector.
- Information on employment from national account statistics, GDP estimates based on value added per worker ratios from PNAD for wages of informal employees and ECINF for profits of autonomous workers
- Russia: labels a worker as informal if he/she is employed in a non-corporate enterprise. Informal employment is the difference between total employment (BLC) and organizations (Full Circle). Value added: based on official data on corrections of sectoral VA on informal activities and non-market households production.

## INFORMAL SECTORS – DATA AND DEFINITIONS

	2003	2008	2003	2008
	$L_i$	$L_i$	$RPIF_i$	$RPIF_i$
Agriculture	71	72	0.53	0.39
Manufacturing	14	16	0.14	0.11
Construction	39	40	0.13	0.15
Trade, excl. Wholesale Trade	71	67	0.74	0.52
Hotels and restaurants	27	38	0.38	0.63
Transport and communication services	19	24	0.20	0.16
Business services	10	14	1.02	1.42
Education	3	4	0.98	0.71
Health and Social work	3	4	1.37	0.60
Other services	28	30	0.11	0.12
All sectors*	33	34	0.26	0.25

**Note:**  $IL_i$  refers to the employment share of informal activities in sector  $i$  (per cent).  $RPIF_i$  refers to the productivity level of informal activities relative to the formal activities within sector  $i$ .

## RUSSIA: EMPL. SHARES AND RELATIVE PRODUCTIVITY LEVELS

	2003-2008	2003-2008
	14-sector	informal split
<b>Contribution of productivity growth in:</b>		
Agriculture	0.18	0.19
Industry	1.40	1.49
Services	2.80	2.88
Mining and Wholesale trade	0.75	0.75
All sectors (1)	5.13	5.32
Reallocation (2)	0.92	0.73
Aggregate productivity growth (3) = (1) +(2)	6.05	6.05

**Note:** Aggregate productivity growth is the average annual logarithmic growth rate. Numbers may not sum due to rounding.

## RUSSIA: INFORMAL ACTIVITIES AND AGGREGATE PRODUCTIVITY GROWTH

	2000	2008	2000	2008
	$IL_i$	$IL_i$	$RPIF_i$	$RPIF_i$
Agriculture	90	86	0.09	0.11
Mining	51	34	0.32	0.18
Manufacturing	48	40	0.33	0.27
Public utilities	29	18	0.58	0.39
Construction	82	74	0.14	0.16
Trade, hotels, and restaurants	58	49	0.29	0.26
Transport services	58	52	0.28	0.26
Communication services	68	66	0.22	0.22
Financial and business services	23	20	0.40	0.34
Other services	63	59	0.27	0.26
All sectors	62	55	0.27	0.25

**Note:**  $IL_i$  refers to the employment share of informal activities in sector  $i$  (per cent).  $RPIF_i$  refers to the productivity level of informal activities relative to the formal activities within sector  $i$ .

## BRAZIL: EMPL. SHARES AND RELATIVE PRODUCTIVITY LEVELS

	2000-2008	2000-2008
	10-sector	informal split
<b>Contribution of productivity growth in:</b>		
Agriculture	0.33	0.19
Industry	-0.10	-0.50
Services	0.59	0.07
All sectors (1)	0.83	-0.24
Reallocation (2)	0.17	1.24
Aggregate productivity growth (3) = (1) +(2)	1.00	1.00

**Note:** Aggregate productivity growth is the average annual logarithmic growth rate. Numbers may not sum due to rounding.

## BRAZIL: INFORMAL ACTIVITIES AND AGGREGATE PRODUCTIVITY GROWTH

	1993	2004	1993	2004
	$L_i$	$L_i$	RPIF <sub>i</sub>	RPIF <sub>i</sub>
Agriculture	99	99	0.06	0.05
Mining	57	58	0.06	0.07
15t16	83	88	0.14	0.10
17t19	87	92	0.12	0.09
20	98	99	0.32	0.10
21t22	72	88	0.15	0.09
23	58	49	0.01	0.01
24	64	73	0.05	0.03
25	70	73	0.28	0.47
26	88	92	0.09	0.06
27t28	71	83	0.13	0.05
29	73	77	0.26	0.20
30t33	54	74	0.37	0.15
34t35	22	72	0.43	0.05
36t37	98	97	0.03	0.03
Public utilities	29	36	0.08	0.09
Construction	90	96	0.12	0.07
Trade, hotels, and restaurants	99	99	0.16	0.05
Transport and communication services	69	83	0.33	0.32
Financial and business services	55	74	1.22	0.28
Other services	64	72	0.21	0.15
All sectors	92	94	0.12	0.08

## INDIA: EMPL. SHARES AND RELATIVE PRODUCTIVITY LEVELS



	1993-2004	1993-2004
	21-sector	informal split
<b>Contribution of productivity growth in:</b>		
Agriculture	0.3	0.3
Industry	0.8	1.4
Services	1.6	2.1
All sectors (1)	2.7	3.8
Reallocation (2)	1.1	0.0
<b>Aggregate productivity growth (3) = (1) +(2)</b>	<b>3.8</b>	<b>3.8</b>

**Note:** Aggregate productivity growth is the average annual logarithmic growth rate. Numbers may not sum due to rounding.

## INDIA: INFORMAL ACTIVITIES AND AGGREGATE PRODUCTIVITY GROWTH

# CONCLUSION

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- This paper studied patterns of structural change and productivity growth in four major developing countries since the 1980s, the BRIC countries, using a newly constructed detailed sector database.
- Based on a structural decomposition, we find that for China, India and Russia reallocation of labour across sectors is contributing to aggregate productivity growth, whereas in Brazil it is not.
- However, this result is overturned when a distinction is made between formal and informal activities within sectors. Increasing formalization of the Brazilian economy since 2000 appears to be growth-enhancing, while in India and, to a lesser extent in Russia the increase in informality is growth-reducing.
- The level of disaggregation is essential for the analysis of reallocation.