Economic Transformation in Africa from the Bottom Up: Macro and Micro Evidence from Tanzania

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April 5, 2016

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Tufts/IFPRI/NBER

Motivation

- Countries in Africa are growing rapidly
- Growth has been accompanied by structural changes
- The lack of industrialization has lead some observers to be pessimistic about Africa's future growth prospects
- But the truth is that we do not understand Africa's recent growth very well

Goals for Today

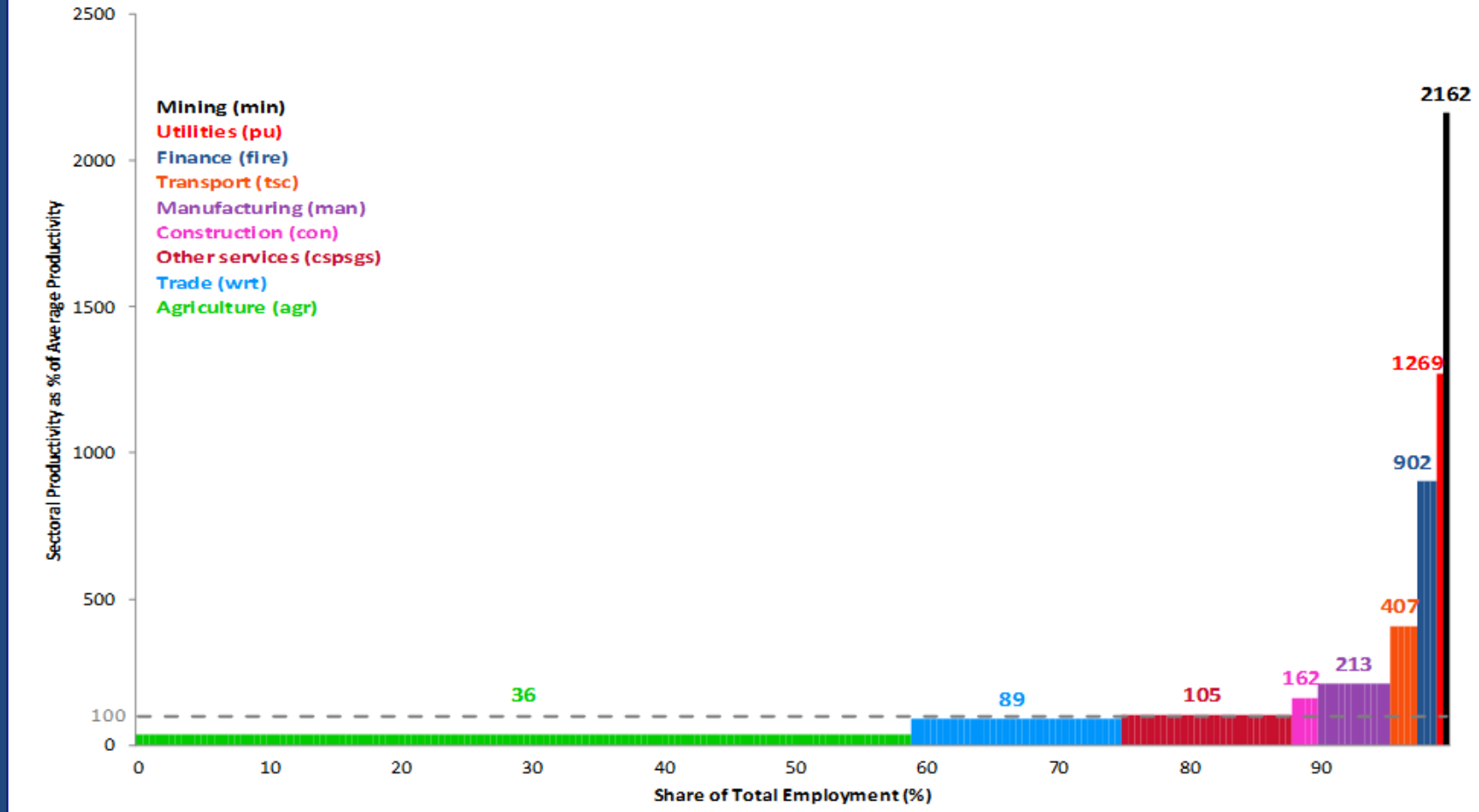
- Show global patterns of structural change
- Show robustness check using DHS data
- Use macro and micro (firm level) data from Tanzania to describe the evolution of employment and productivity growth during Tanzania's recent growth spurt
- Discuss potential for this sector to contribute to labor productivity growth

Structural Change: dfn and importance

- Significant changes in employment and output shares of an economy
- Typically have thought about it using dual economy models – not neo-classical growth models
- Important because can be a ‘short-cut’ to rapid growth (most recently China and Vietnam)
- ILO project/Groningen Growth and Development Centre – no data for Africa!

Structural Change: Intuition, Africa 2005

Figure 3: Labor Productivity Gaps in Africa in 2005



Source: Own calculations using data from McMillan and Rodrik (2011)

One Way of Measuring Structural Change

$$\hat{y}_t = \sum_{i=n} S_{i,t}\,\pi_{i,t-k}\hat{y}_{i,t} + \sum_{i=n} \pi_{i,t-k} dS_{i,t}$$

Within sector growth

Structural change

y : economy-wide output per worker

y_i : sector output per worker

S_i : employment share

i: indexes sectors

Economy-wide productivity growth: $\hat{y} = \frac{dy}{y}$,

Sector productivity growth: $\hat{y}_i = \frac{dy_i}{y_i}$, is

Relative productivity of sector i : $\pi_i = \frac{y_i}{y}$

$dS_i = S_{i,t} - S_{i,t-k}$

t -k and t stand for initial and final years

Decomposition of Growth by Region: 1990-2010

Figure 4.a. Decomposition of Productivity Growth by Country Group, 1990-1999 (unweighted)

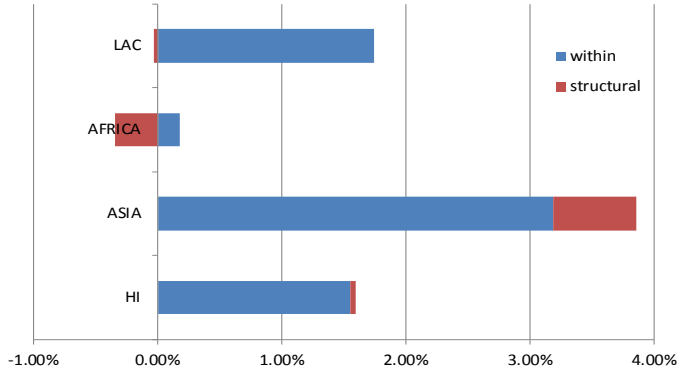


Figure 4.b. Decomposition of Productivity Growth by Country Group, 1990-1999 (weighted)

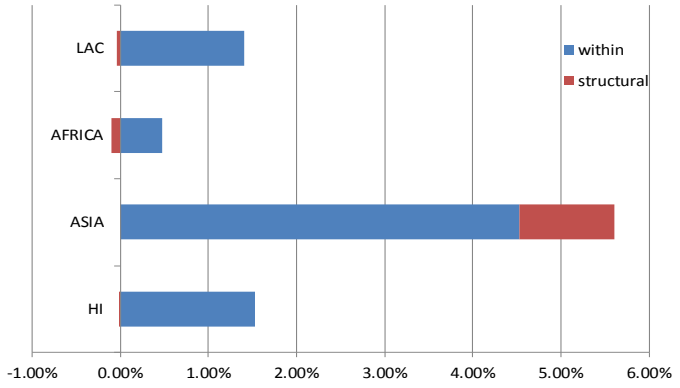


Figure 4.c. Decomposition of Productivity Growth by Country Group. Post 2000 (unweighted)

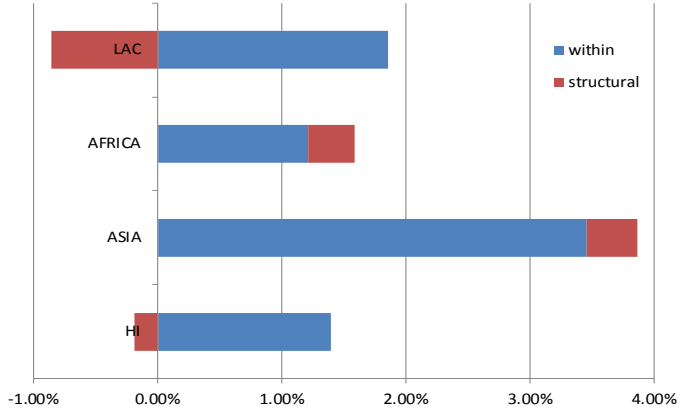
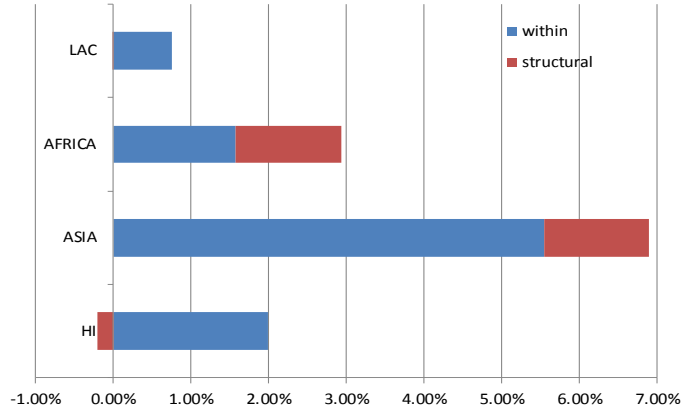
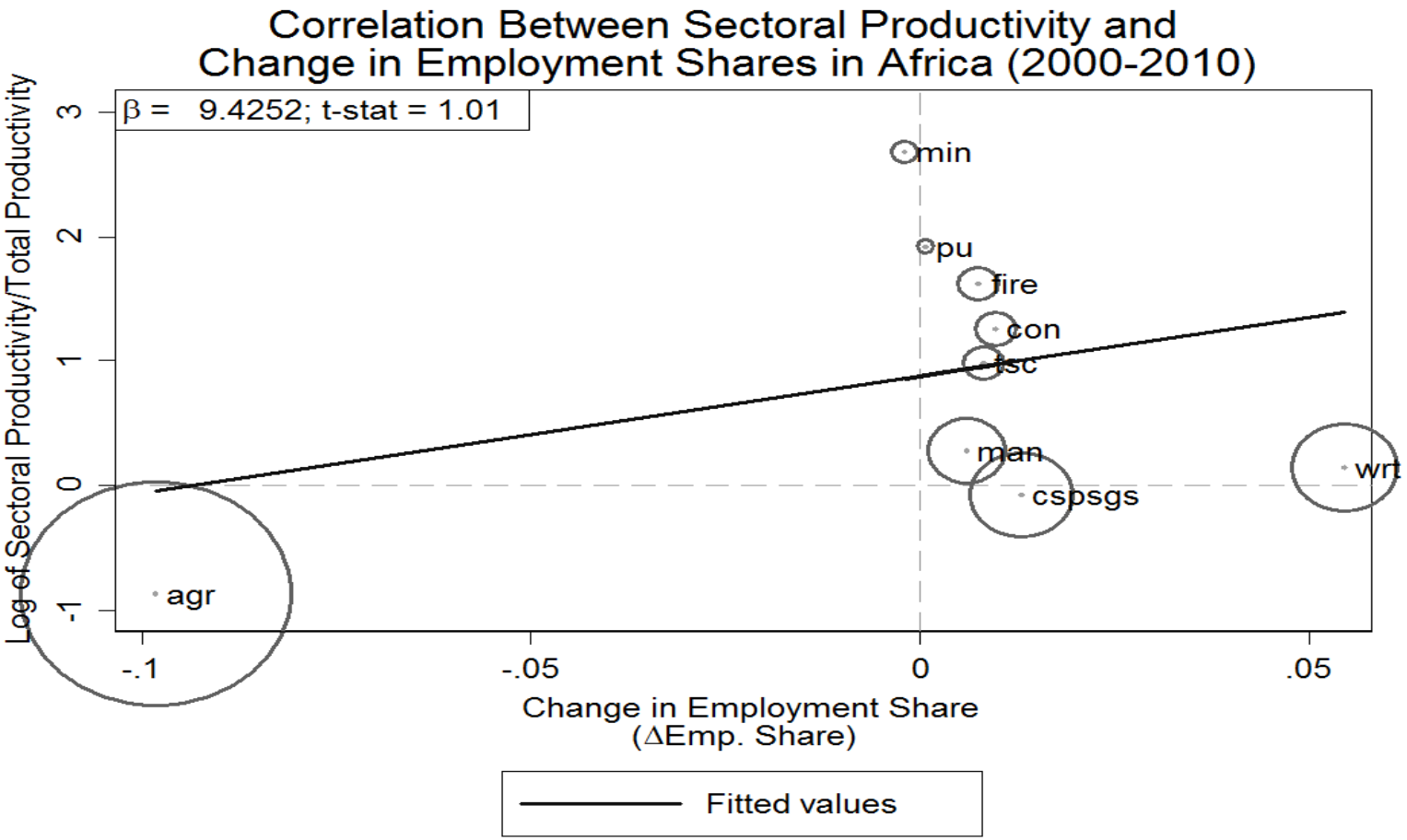


Figure 4.d. Decomposition of Productivity Growth by Country Group. Post 2000 (weighted)



Source: McMillan et.al. (2013)

Africa looks very different from Asia

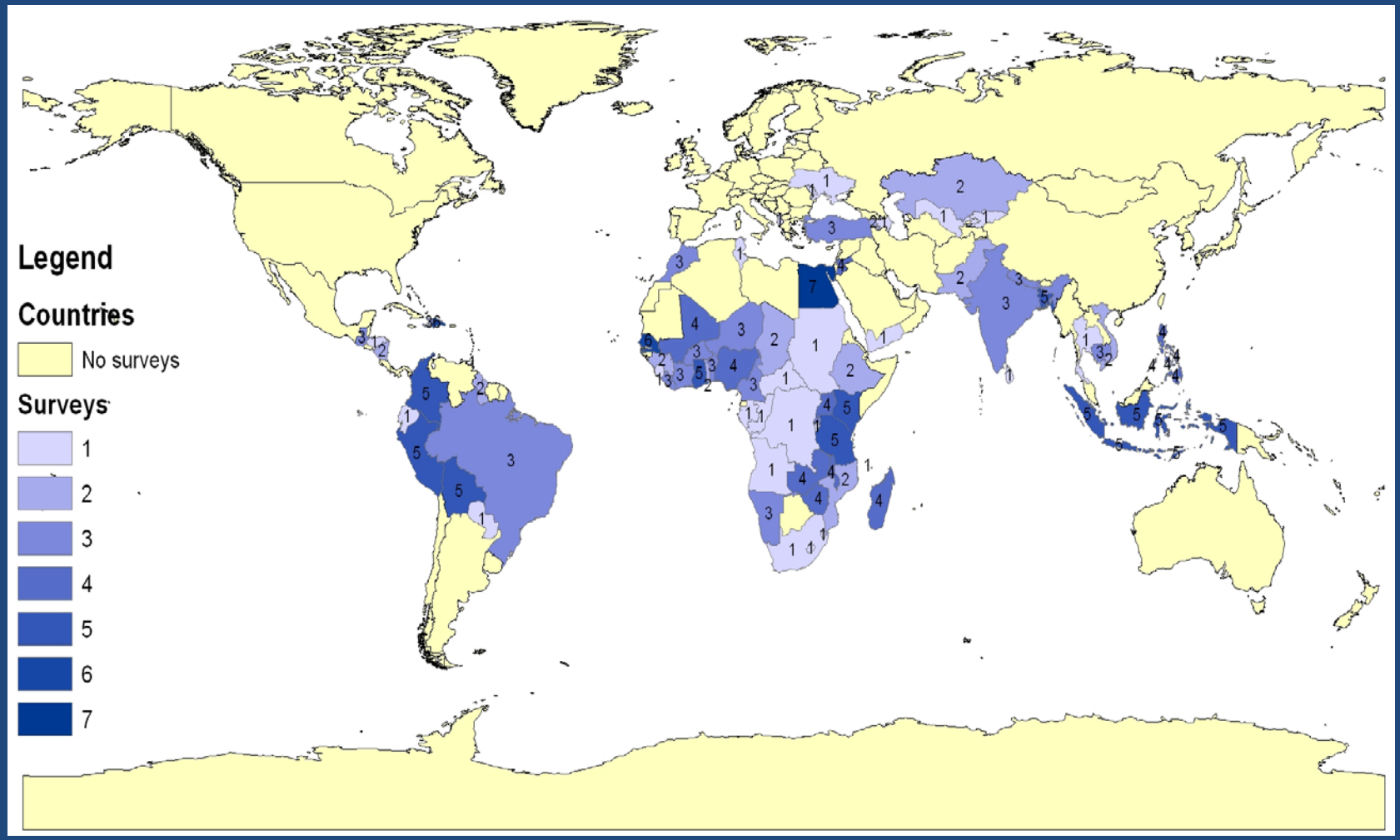


*Note: Size of circle represents employment share in 2000
**Note: β denotes coeff. of independent variable in regression equation:
$\ln(p/P) = \alpha + \beta \Delta$Emp. Share
Source: Authors' calculations

Robustness Check

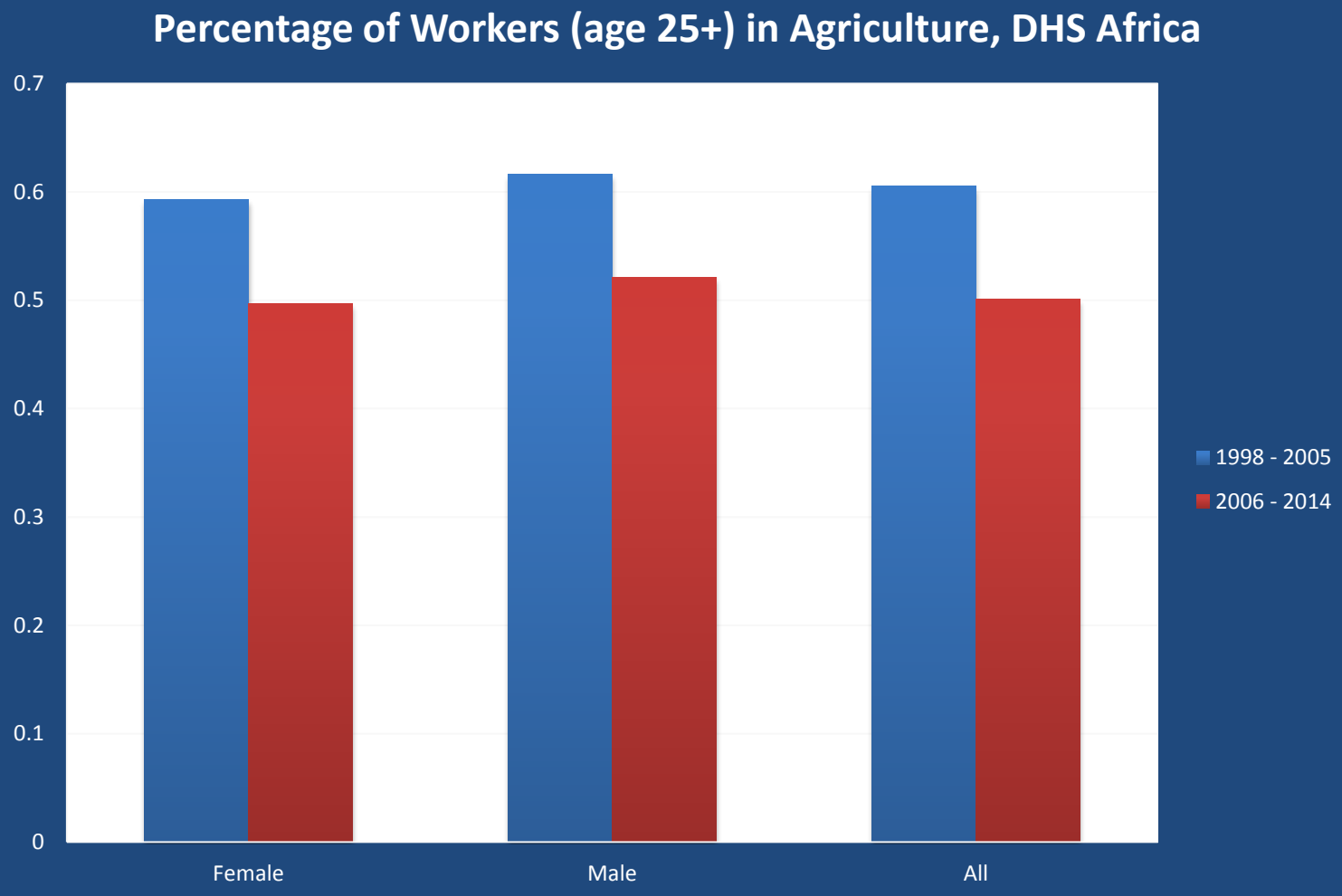
- Data quality is an issue (Devarajan & others, 2013, JDS 2015)
- Use data from the Demographic and Health Surveys (DHS) to compute labor shares to verify the decline in the share of the labor force engaged in agriculture
- Advantages of DHS:
  - Larger sample & more of the poorest countries
  - Consistent survey instrument across countries

DHS Regions



Source: Günther and Harttgen 2013

Changes in Occupational Structure: Past Decade



Summarizing the Results

- Irrespective of the source of data
  - Decline in agricultural employment share
  - Rise in employment share in other activities where average productivity is higher than average productivity in agriculture
  - But unlike other developing regions in the past, no large scale increase in labor intensive manufacturing

Pressing Questions

- What jobs are people doing instead of agriculture?
- Why are they doing these jobs?
- Can these jobs be a source of sustained productivity growth?
- These questions can’t be answered with macro data.

Structural Change in Africa: Evidence from Tanzania

- Use Tanzania: high growth, good data, no oil
- Use 9 different datasets
  - First, describe broad trends in the Tanzanian economy 1988-2002 vs 2002-2012 (macro evidence)
  - Second, zero-in on employment and productivity growth in the private non-agricultural sector using firm level surveys including a nationally representative survey of micro, small and medium sized enterprises done in 2010 and released in 2014 (micro evidence)

Population around 52 million

Headcount poverty around 28%

Inequality – is a problem as it is in almost all poor countries – especially when they start to grow

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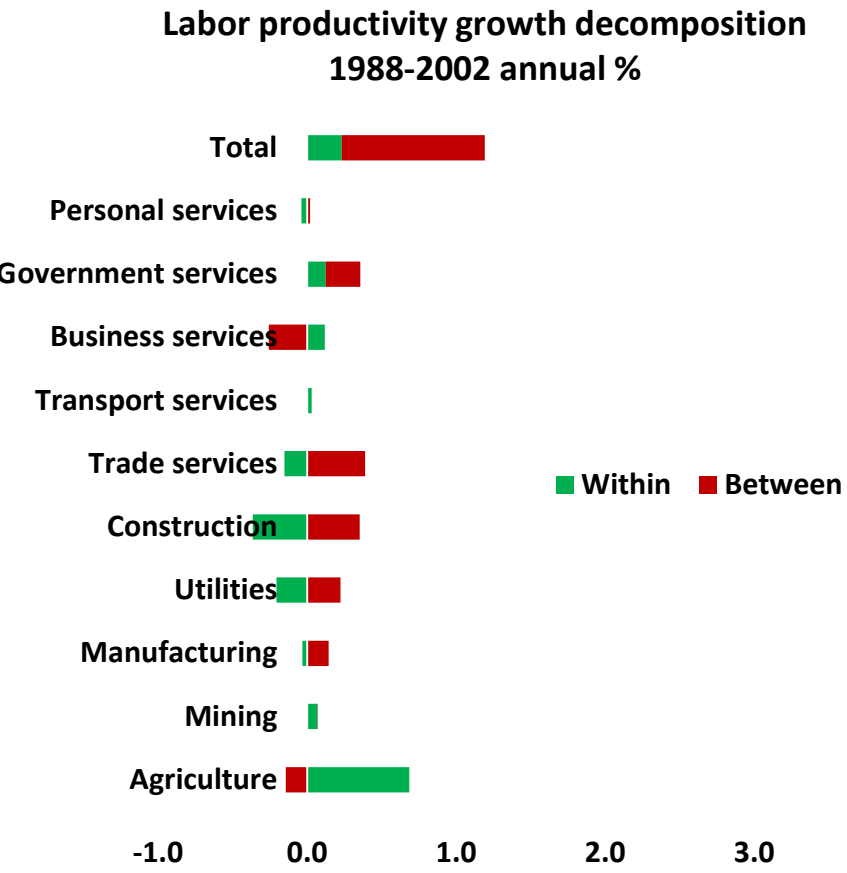
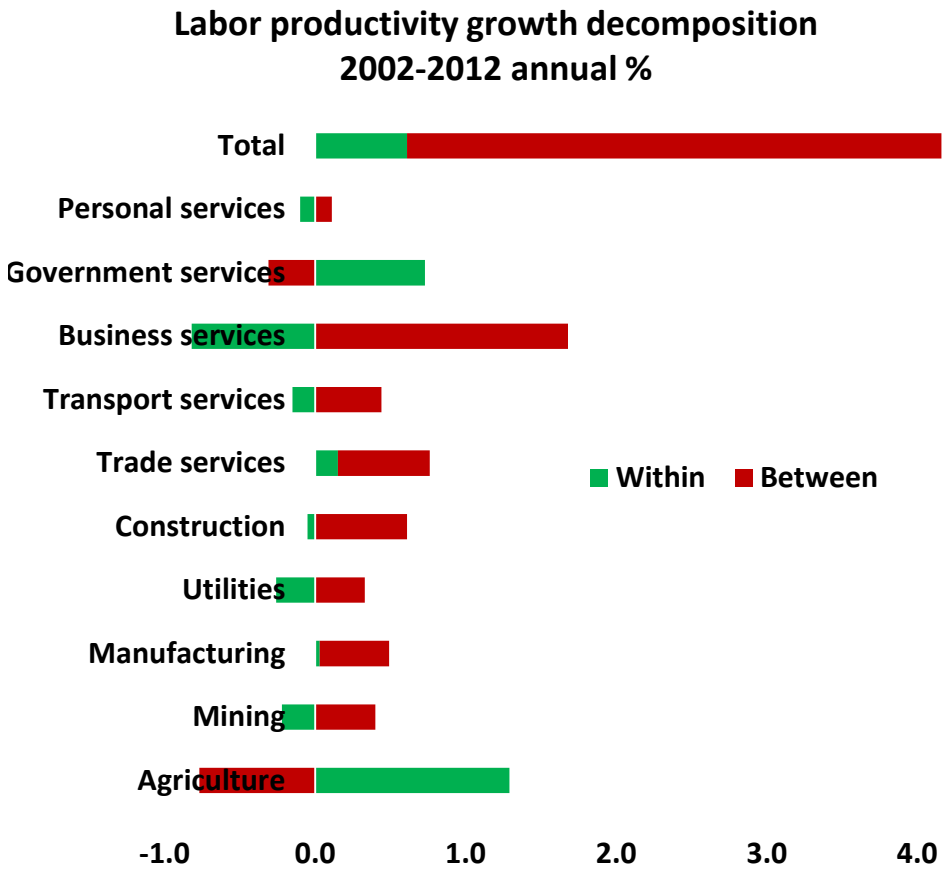
Tanzania Is One of the African Countries with Rapid Growth in Recent Years: Growth Is Led by Structural Change





- **In 1988-2002, labor productivity annual growth rate is 1.3%**
- **In 2002-2012, labor productivity annual growth rate is 4.2%**

Sources: Authors' calculation. Data for 1988 is from GGDC. For 2002 and 2012 the employment data is from Tanzanian population and housing censuses and value added is from national account after rebasing (NBS)

Lots of Growth Due to Structural Change: Where are the Jobs?

Small Firms in the 'Informal' Economy Lead Job Creation

- **More than 80% of "new" jobs are created by the informal economy**
- **Number of private formal nonagricultural firms increased from 14,670 in 2002 to 45,210 in 2013, and small firms with employees less than 20 increased from 11,320 in 2002 to 38,290 in 2013**
- **Even in the private formal economy, 56% of new jobs are created by small and medium scale firms with employees less than 100**

	2002		2012		Annual growth rate in employment		
	Employment Share in Census		Employment Share in Census		Census	Formal	Informal =
	By sector	Formal in total	By sector	Formal in total			Census-formal
Agriculture	81.1	0.9	65.8	0.8	**0.4**	-0.4	0.4
Mining	0.5	9.1	2.6	3.3	20.9	9.1	21.6
Manufacturing	1.9	57.9	3.2	44.5	8.0	5.2	11.0
Utilities	0.3	100.0	1.3	100.0	18.7	18.7	
Construction	1.1	15.1	2.4	10.2	10.8	6.6	11.4
Trade services	7.7	8.4	11.3	4.5	6.5	0.1	6.9
Transport services	0.9	33.8	1.7	19.9	9.2	3.6	11.3
Business services	0.3	100.0	0.8	66.7	13.6	9.1	
Government services	2.9	100.0	3.5	100.0	4.4	4.4	
Personal services	3.3	0.0	7.4	0.0	11.2		11.2
Total economy	**100**	**6.5**	**100**	**8.5**	**2.5**	**5.3**	**2.3**
Total nonagriculture	18.9	30.6	34.2	23.3	8.8	5.8	9.9
Total private nonagriculture	**16.0**	**17.9**	**30.7**	**14.5**	**9.4**	**7.1**	**9.9**

What do we know about these small firms' contribution to GDP ?

- The MSMEs produced roughly **30%** of national private nonagricultural value-added in 2010
- The full-time manufacturing MSMEs account for **22%** of national manufacturing value-added
- So average productivity quite low.

Sources: Authors calculation using data of National account, ASIP and MSME

Tanzania: Summarizing Macro Evidence

- **Labor productivity** grown more rapidly over past 14 years than at any other time in recent history – roughly 4% per annum.
- **Employment growth** strong keeping up with population growth at roughly 2.2 percent per annum.
- **Majority (88%) of employment growth has been in the non-agricultural and largely informal private sector.**
- These stylized facts present a **challenge** and an **opportunity**.

Challenges: small firms get a bad rap

- La Porta & Shleifer (2011) on Africa:

  "Growth strategies in Africa need to focus on formal firms, especially the large ones"

- Hurst (2011) on the United States:

  "Most small businesses have little desire to grow big or to innovate in any observable way"

Opportunities: lots of big firms started small

- All of these companies started in a garage with less than 10 employees:
  - Mattel (Barbie and Ken)
  - Hewlitt Packard
  - Yankee Candle Company
  - Harley Davidson
  - & more

Opportunities: evidence of large payoffs to targeting some small firms

- McKenzie (2015)
  - a business plan competition in Nigeria helped generate growth in employment and profits among entrepreneurs who would have otherwise remained small or non-existent.
- Duflo et al (2015)
  - India 'gung-ho entrepreneurs' respond to microfinance with business growth and enhanced performance.

Opportunities: evidence from Africa

- Paul Kinuthia (Kenyan)
  - Interconsumer Products started in an apartment in a Nairobi slum – sold business to L'Oreal in 2014 for millions
- Enterprise Maps of Ghana, Ethiopia, Tanzania, Mozambique and Zambia
  - Virtually all of the large manufacturing companies today started out as small traders

Can small firms be part of growth strategy?

- Typically tend to think in terms of dual economy models where the growth of the modern sector will lead to the disappearance of small unproductive firms

- Not enough thought goes into policies to support productivity growth among small firms which employ the bulk of the labor force

- Prevalance of informality in Africa means we need to think about the role of MSMEs in productivity and employment growth

Framework for organizing thoughts

- Political Arguments
  - Country context is extremely important.
  - For example, in Tanzania, history of domination of private sector by tiny Asian minority.
  - Today, large firms mostly owned by super rich Asian minority (less than 1 percent of the population). Small firms owned by relatively poor African majority (5 million people involved).
- Economic Arguments
  - Can small firms contribute to growth directly or indirectly?

Economic Arguments

- Small firms should be part of the growth strategy if they can contribute to growth directly or indirectly.
  - Directly means growth in output per worker is high enough to raise economy wide growth in output per worker.
  - Indirectly by (i) facilitating commerce ; (ii) reducing negative externalities associated with unemployment or; (iii) contributing to political stability.

Today's Focus: Direct Evidence

- Tanzania's first nationally representative survey of micro, small and medium sized enterprises conducted in 2010 (MSMEs)
- This type of survey is rare but important.
- Recent paper by Li and Rama (2015) in World Bank Research Observer outlines all of the 'mistakes' people have made by using bad data to make inferences about small firms

Micro Data

- Micro, Small and Medium Sized Enterprise Survey (MSME), Tanzania 2010
- Nationally representative of small businesses
- Covers roughly 5 million workers and 3 million businesses

Use these data to understand

- Locations of MSMEs
- Lines of business
- Motivations of MSME owners
- Labor productivity of MSMEs
- Employment growth within MSMEs
- Potential to contribute to economy-wide labor productivity growth

Where are the small firms?

Region	Population Share	Total Employment %	Urban Employment %	Rural Employment %
Dodoma	5.44	3.85	39.55	60.45
Arusha	3.21	2.74	56.68	43.32
Kilimanjaro	2.95	2.75	45.26	54.74
Tanga	3.85	5.07	50.45	49.55
Morogoro	6.01	6.44	53.17	46.83
Pwani	2.66	3.1	38.12	61.88
Dar-es-Salaam	14.64	17.32	100	0
Lindi	2.24	2.61	41.32	58.68
Mtwara	3.04	2.44	42.52	57.48
Ruvuma	3.11	3.83	43.33	56.67
Iringa	5.9	4.59	37.16	62.84
Mbeya	10.88	8.02	40.52	59.48
Singida	1.93	2.34	37.18	62.82
Tabora	2.67	2.08	55.26	44.74
Rukwa	2.42	2.41	35.54	64.46
Kigoma	2.04	1.73	9.56	90.44
Shinyanga	7.16	6.81	36.36	63.64
Kagera	2.9	2.83	15.67	84.33
Mwanza	8.9	10.7	36.86	63.14
Mara	3.27	4.6	48.32	51.68
Manyara	1.65	1.58	37.99	62.01
Kaskazini Unguja	0.34	0.19	0	100
Kusini Unguja	0.26	0.14	0	100
Mjini Magharibi	1.54	1.11	79.99	20.01
Kaskazini Pemba	0.48	0.38	12.19	87.81
Kusini Pemba	0.51	0.35	27.87	72.13
Total		**100**	**51.29**	**48.71**

What do MSMEs do?

	Number	% in total
Extraction	**21**	**0.4**
Manufacturing	**928**	**16.6**
Grain milling	95	1.7
Beverage	466	8.3
Textile	189	3.4
Wood	30	0.5
Building materials	59	1.1
Furniture	89	1.6
Trade services	**4,479**	**79.9**
Wholesale	145	2.6
Retail with shops	865	15.4
Retail with stalls	1,376	24.5
Retail on street	402	7.2
Beverage services	441	7.9
Food services	1,250	22.3
Transport	**17**	**0.3**
Business services	**31**	**0.6**
Repair and personal services	**130**	**2.3**
Total	**5,606**	

Source: Authors' calculation using MSME survey 2010

Motivation 1: Previous occupation MSME owners

What was your main occupation before you started this business ?	All Firms %
Farming	36.73
Housewife (home maker)	19.99
Previously ran a small enterprise	14.59
Other	7.74
Unemployed	7.56
Previously employed in business	6.64
In education, at various levels	4.24
Civil servant/employed by the government	2.51

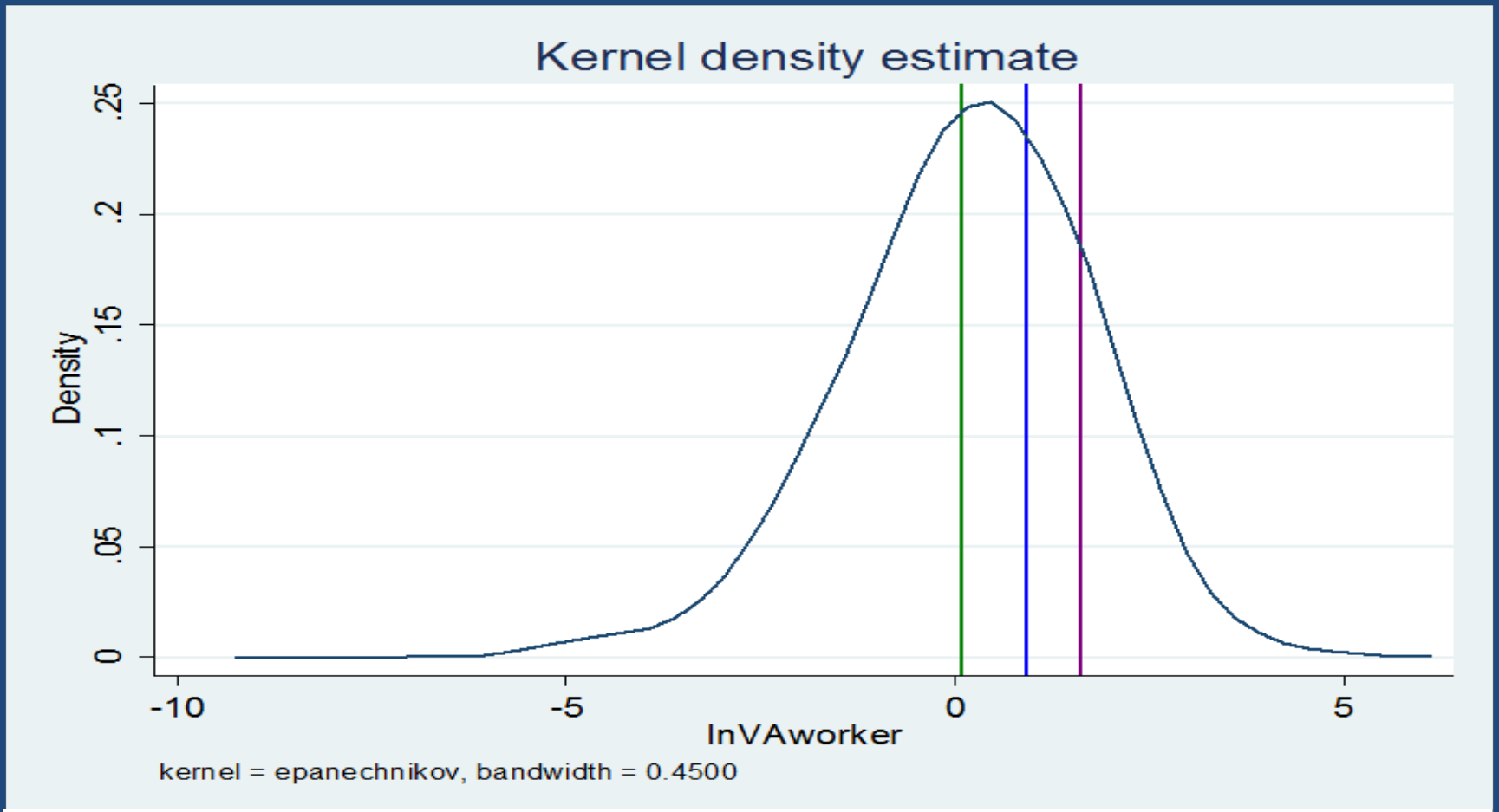
Motivation 2: why this business?

	Manufacturing	Other Services	Trade Services
I had previous experience in this line	28.96	20.54	14.44
Friends/relatives are in this line	20.14	12.84	15.85
I saw a market opportunity	43.3	43.82	47.88
My capital could only finance this business	34.74	44.37	44.75
No apparent reason	3.22	4.38	4.85
I could start business gradually	0	0.49	0.24
Goods are easy to manufacture and sell	1.04	2.08	1.66
I just wanted to be near my house	0.56	0.71	1.12
I have been trained in it, I am an expert	3.14	0.5	0.29
Goods are available	0.22	0.4	0.76
I perceived it to be profitable	0.95	1.42	1.74
I liked it	1.39	1.57	1.2
Business does not have many problems	0.98	0.47	0.67
None	0.75	1.07	0.94

Motivation 3: Job Satisfaction

If you were offered a full-time salary paying job, would you take it?	46.57
Who would you rather work for?	
A large private company	23.99
Government	63.92
Someone else's business	9.13
Anywhere	2.97
And why do you say that?	
Better security of income	82.32
Shorter hours	5.07
Less risk	1.94
To get pension	1.36
I am less educated	1.78
They listen to the opinions of the employees	0.95
As long as I get a living	0.46
Job security	1.37
Others	3.12
None/Nothing	1.63

Productive heterogeneity MSMEs



Notes: Vertical lines are average economy wide labor productivity in **agriculture**, **trade services,** and **manufacturing**.

Employment growth MSMEs

	Mean	S.D.	Share of Firms
No Employment Growth	0	0	87.76
Employment Growth	0.13	0.08	12.24
Overall	**0.02**	**0.05**	**100**

Identification of firms with potential (1)

		# of firms	# of employees	VA per worker ($US)	# of employees per firm
Group 1	Want to be in business, keeps accounts & labor productivity > economy-wide trade services labor productivity	261,375	449,783	6,463	1.72
Group 2	Conditions of Group 1 + with paid employees	46,081	183,686	5,890	3.99
Group 3	Conditions of Group 2 but labor productivity > economy-wide manufacturing labor productivity	26,207	106,415	8,311	4.06

Identification of firms with potential (2)

		Share of MSME total (percentages)			Ratio to MSME average	
		Firms	Employees	Value Added	Lprody	Firm size
Group 1	Want to be in business, keeps accounts & labor productivity > economy-wide trade services labor productivity	10.38	11.34	37.4	3.30	1.09
Group 2	Conditions of Group 1 + with paid employees	1.83	4.63	13.9	3.01	2.53
Group 3	Conditions of Group 2 but labor productivity > economy-wide manufacturing labor productivity	1.04	2.68	11.4	4.24	2.58

Source: Authors calculation using MSME data

How much economy-wide growth from select MSMEs ? Framework

$$\pi_M > \pi_{HI} > \pi_{LI} > \pi_A$$

$$(1)\ \hat{y}_M = \beta(\ln y_M^* - \ln y_M) + \gamma_M(\ln y^*(\Theta) - \ln y)$$

$$(2)\ \hat{y}_A = \gamma_A(\ln y^*(\Theta) - \ln y)$$

$$(3)\ \hat{y}_{HI} = \gamma_{HI}(\ln y^*(\Theta) - \ln y)$$

Employment shares in the four sectors are given by:

$$\alpha_M, \alpha_{HI}, \alpha_{LI} \ \ and\ (1 - \alpha_M - \ \alpha_{HI} - \ \alpha_{LI})$$

Thus, total real GDP in this economy is given by:

$$(5)\ y = \ \alpha_M y_M + \alpha_{HI} y_{HI} + \alpha_{LI} y_{LI} + (1 - \alpha_M - \alpha_{HI} - \alpha_{LI}) y_A$$

How much economy-wide growth from select MSMEs ? Framework Three sources of productivity growth

(A): $\alpha_M \pi_M \beta (\ln y_M^* - \ln y_M)$

Unconditional convergence in modern sector

(B): $(\alpha_M \pi_M \gamma_M + \alpha_{HI} \pi_{HI} \gamma_{HI} + \alpha_A \pi_A \gamma_A)(\ln y^*(\Theta) - \ln y)$

Investments in fundamentals

(C): $(\pi_M - \pi_A) d\alpha_M + (\pi_{HI} - \pi_A) d\alpha_{HI} + (\pi_{LI} - \pi_A) d\alpha_{LI}$

Structural changes

How much economy-wide growth from select MSMEs ? Baseline

Parameters used in simulations based on 2010-2012 data

	Share of employment (α_i)	Relative labor productivity (π_i)	Annual change in share of employment ($d\alpha_i$)
Agriculture (*A*)	68.2	0.41	-1.54
Private formal non-agriculture (*M*)	4.6	10.88	0.15
In-between non-agriculture (*HI*)	2.5	4.70	0.13
Other informal non-agriculture (*LI*)	24.6	0.42	1.26

Source: Authors calibration based on National Accounts, Census and MSME data

How much economy-wide growth from select MSMEs ? Results

Simulation results of in-between sector's role in economy-wide productivity growth

	S1	S2	S3
Assumptions			
$d\alpha_{HI}$	0.130	0.224	0.224
$\hat{y}_{HI}$			2.55
Simulation results			
Economy-wide productivity growth rate (annual %)			
Structural change led growth	0.56	0.96	0.96
Within sector growth			0.31
Total	0.56	0.96	1.27
Contribution (Total structural change led economy-wide growth = 100)	26.1	37.9	37.9

How to achieve this growth?

- Targeting ‘high potential’ firms
- Examples of targeting:
  - Business plan competitions (+/-)
  - India’s small scale reservations policy (+/-)
  - Putting stones in rice
- So far piecemeal efforts, not surprising that results are disappointing
- Need systematic and systemic effort

How to achieve this growth?

"Ultimately what we want, if we believe Africa rising, we want African consumers and businesses benefitting – particularly African small businesses. Without investment in robust financial services, it won't happen. It's not about the big deals. We need to get investment into the financial services industry to make this happen. And we need the help of the central bank governors to allow for the flexibility needed to tailor products to consumers and small businesses."

Jamie Dimon, CEO JPMorgan Chase

Bloomberg, The Africa Opportunity, March 12, 2016

Conclusions

- Small firms cannot be ignored
- Some small firms have a lot more potential than people thought
- We need much more research in this area because this is happening everywhere – not just Africa although I believe Africa is different
- Exciting that some Africans are taking this seriously