Development Economics: Lecture 1

Economic Growth and Structural Transformation

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Administrative issues

- Lectures: Mon-Fri, 14:00-16:00 BST
- Seminars: Mon-Fri, 16:30-17:30 BST
- Lectures/seminars: in person (MRB)
- Lecture slides $\rightarrow$ https://niclasmoneke.com/teaching/
- Structure: see below
- Readings: see syllabus on course page and website

About me

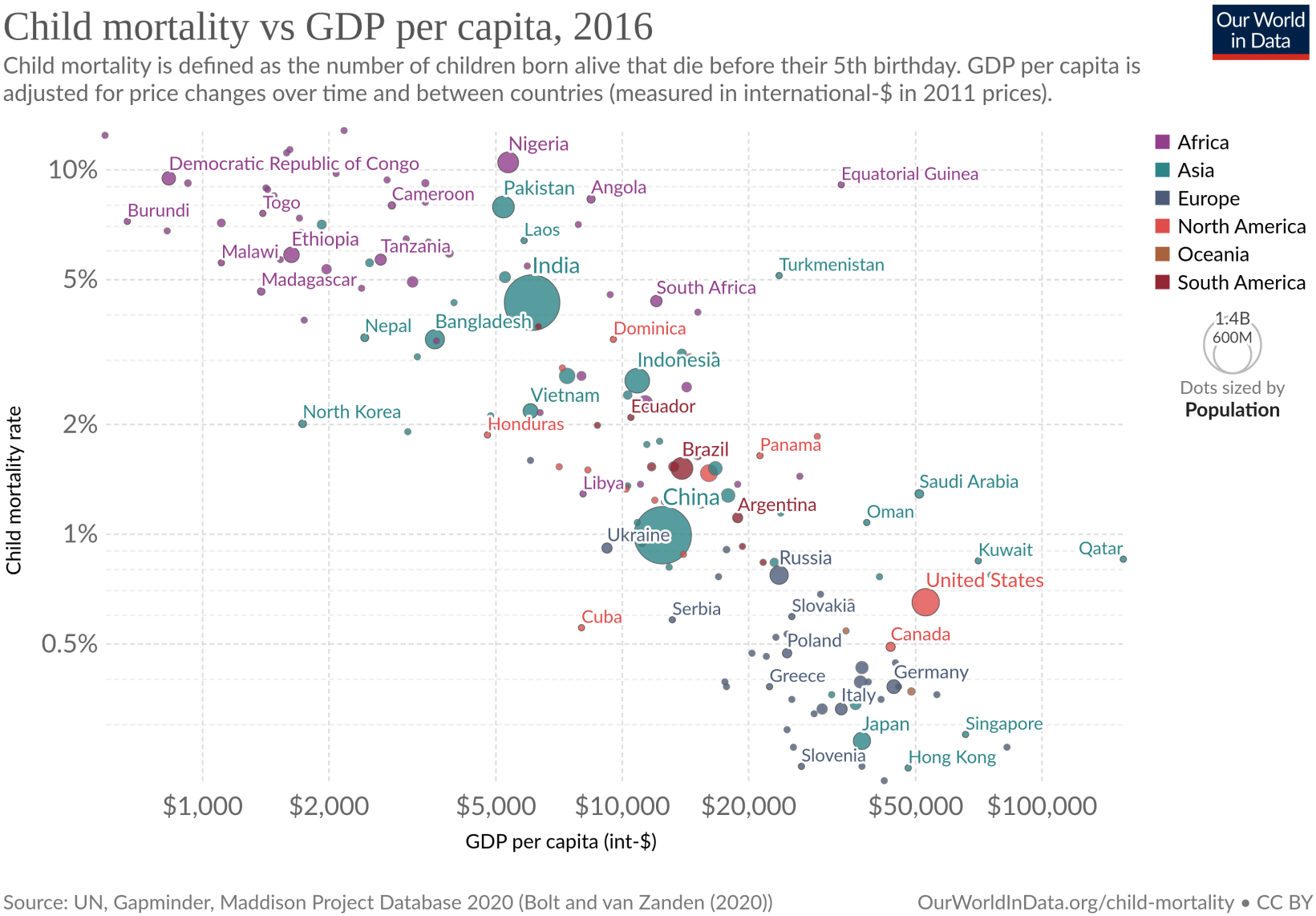
- joined Oxford in September 2020, from LSE
- development economist, interested in energy, environmental and spatial economics:
  - structural transformation [leaving subsistence agriculture]
  - productivity [access to energy and modern production]
  - market integration [infrastructure investments, e.g. roads, mobile phones]
  - environmental externalities of development [deforestation, industrial pollution]
- empirical work focused on today's (very) low income countries (LICs), e.g. Ethiopia, Myanmar, Zambia, Ghana, Kenya
- newly designed development economics course, aims to bring graduate students towards research frontier

Structure of the course (days 1–5)

Topics 1-5 (Moneke)

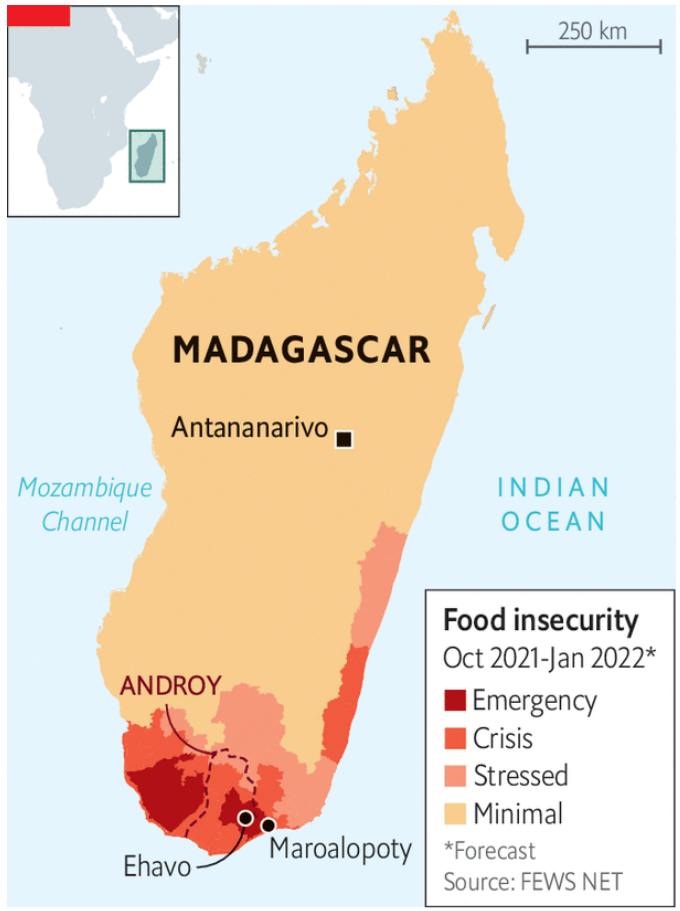
- Topic 1 (Mon 09/09): Econ. Growth and Transformation
- Topic 2 (Tue 10/09): Poverty Traps and Policy Scale-up
- Topic 3 (Wed 11/09): Infrastructure and Spatial Development
- Topic 4 (Thu 12/09): Energy Access and Electrification Puzzle
- Topic 5 (Fri 13/09): Climate Change, Environment and Dev.

Motivating facts (I): growth



Source: Our World in Data (2022).

Motivating facts (II): poverty traps



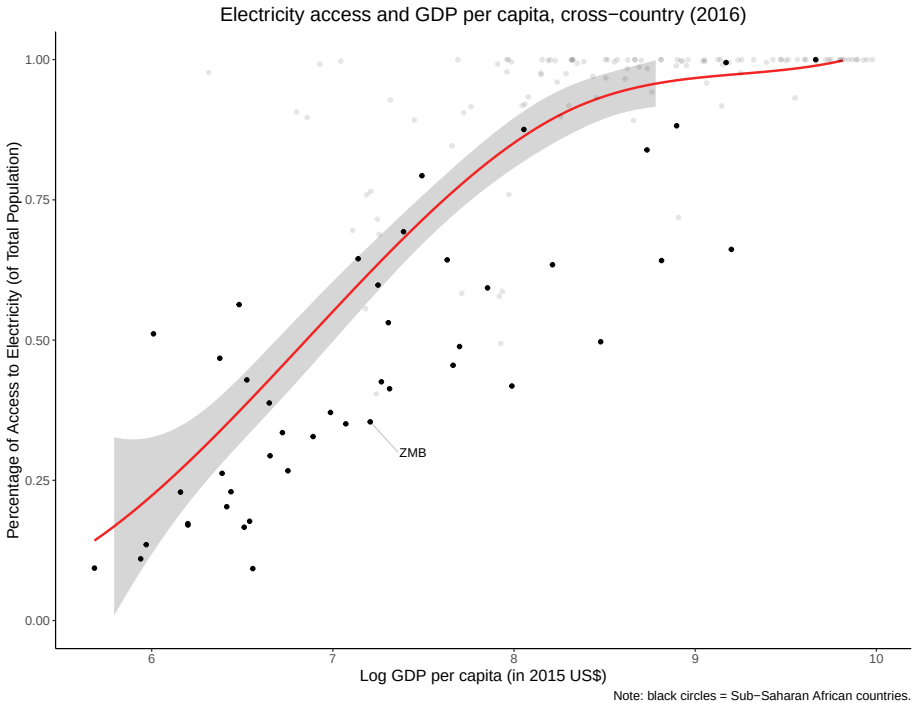
Source: The Economist, *Madagascar is on the brink of famine*, September 2nd 2021 edition, retrieved from https://www.economist.com/middle-east-and-africa/madagascar-is-on-the-brink-of-famine/21804098

Motivating facts (III): spatial inequality

Source (left): Wikimedia Commons, *Traffic jam on Bole Road, Addis Abeba, Ethiopia*, November 2017, retrieved from https://commons.wikimedia.org/wiki/File:Traffic_jam_on_bole_rode_Addis_Abeba.jpg

Source (right): Wikimedia Commons, *Dwellings in Lake Langano area, Oromia, Ethiopia*, December 2017, retrieved from https://commons.wikimedia.org/wiki/File:African_dwellings_in_Oromia_Ethiopia_06.jpg

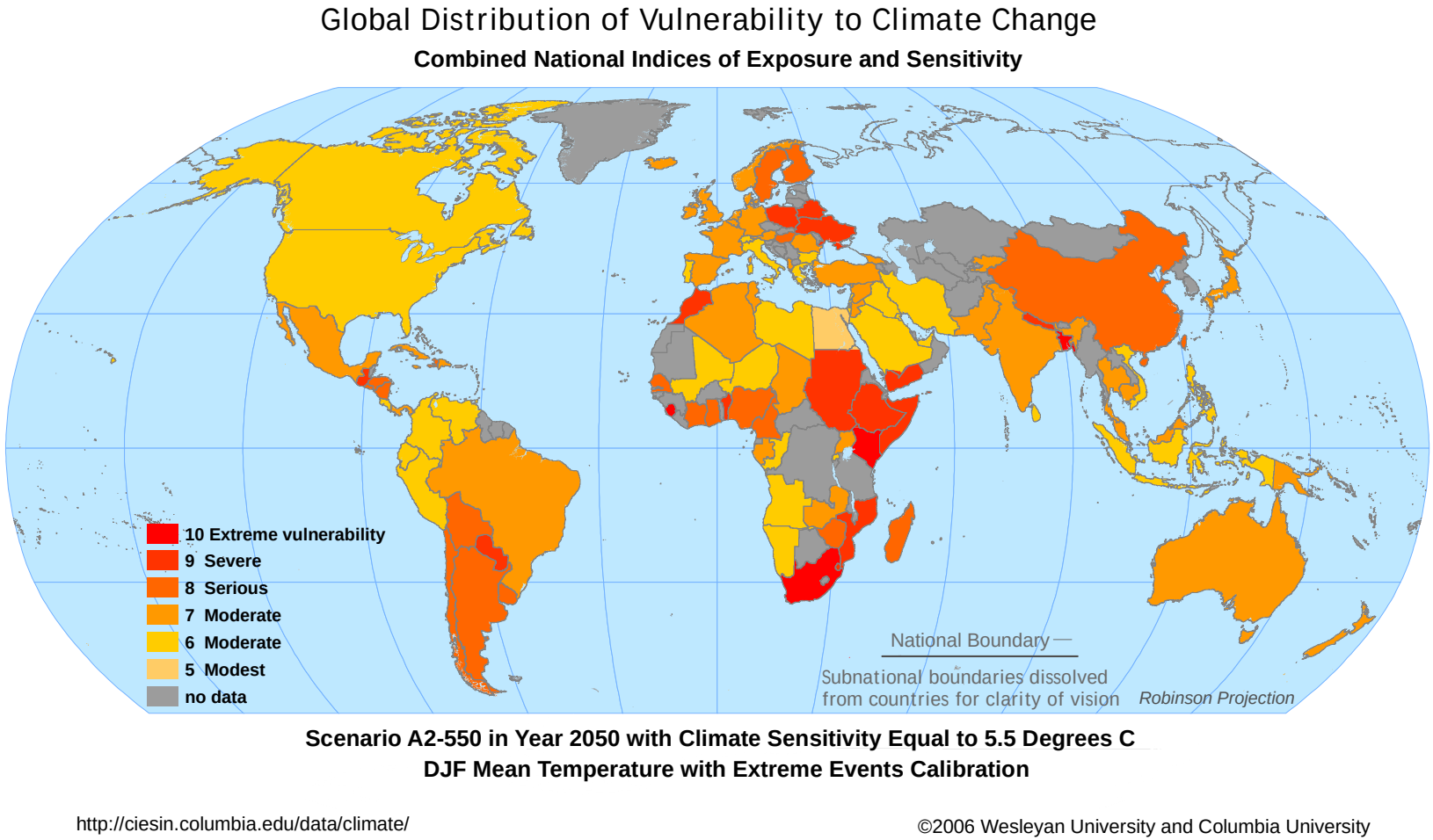
Motivating facts (IV): energy



Source (left): Figueiredo Walter & Moneke (2022), using WDI data

Source (right): VIIRS Nightlights

Motivating facts (V): climate change



Source: Yohe, G. et al. (2006), *A Synthetic Assessment of the Global Distribution of Vulnerability to Climate Change from the IPCC Perspective that Reflects Exposure and Adaptive Capacity, Map 17.3*. Palisades, New York: CIESIN (Center for International Earth Science Information Network), Columbia University.

Why study structural transformation and growth?

A question in three parts:

- why study growth?
- why study structural transformation?
- why study structural transformation and growth together?

Why study growth?

> Once one starts to think about [growth],
> it is hard to think about anything else.
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> — Robert E. Lucas, Jr. (1988), *On the Mechanics of Economic Development*

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- growth assumed to correlate positively with human well-being
- recent interest in more nuanced aspects of growth:
  - inequality and inclusion
  - environmental consequences
- however, even if not an end in itself, crucial to understand:
  - why do some places experience growth and others not?
  - how do different growth rates across places come about?
  - which economic/social changes are caused by growth?

Why study structural transformation?

- poor economies are systematically different from richer ones
  - however, unclear which separating aspects to focus on

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- poor economies are systematically different from richer ones
  - however, unclear which separating aspects to focus on
- transformations of economies are inherently interesting:
  - sectoral shifts out of agriculture
  - spatial shifts from rural to urban
    - emergence of urban centres in rural areas
    - differential agglomeration of existing urban centres
    - movements between rural and urban (commuting, migration)
  - activity shifts from home to market production
  - employment shifts from self-employment to wage employment

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- empirical reality, both in cross-section and time series:
  - growth and transformation seem to occur together empirically
  - however, unclear if one is the artefact of the other

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- empirical reality, both in cross-section and time series:
  - growth and transformation seem to occur together empirically
  - however, unclear if one is the artefact of the other
- big questions for aspiring researchers:
  - are growth and transformation causally related?
  - does growth cause transformation?
  - does transformation cause growth?
  - do they feed on each other in some fashion?

Theories of growth: one-sector models

- models of economic growth historically structured around one-sector models:
  - Harrod-Domar
  - other models of capital accumulation
    (e.g. Solow (1956), Swan (1956))
  - endogenous growth models
    (e.g. Romer (1986, 1990), Lucas (1988, 1993))
- one-sector model an apparently useful model to describe growth trajectories of OECD countries after WWII
  - agricultural sector small, sufficient supply to feed population
  - services sector non-tradeable, function of aggregate demand
  - growth concentrated in industry/manufacturing (= one sector)

Solow (1956) model of economic growth

Production function:

$$Y(t) = F\left(K(t), A(t), L(t)\right) = K(t)^{\alpha}\left[A(t)L(t)\right]^{1-\alpha}$$

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Assumptions:

- perfectly competitive markets
- $\alpha < 1$ CRS overall, DRS in each factor (K, L)
- technology A grows exogenously at rate g, labout L at rate n
- closed economy, savings S equal investment I

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Capital per effective labour unit grows exogenously at rate:

$$\frac{\dot{k}}{k} = \frac{\dot{K}}{K} - \frac{\dot{A}}{A} - \frac{\dot{L}}{L}$$

Solow (1956): evolution of K

Fundamental equation of economic growth:

$$\dot{k} = sf(k(t)) - (d + g + n)\, k(t)$$

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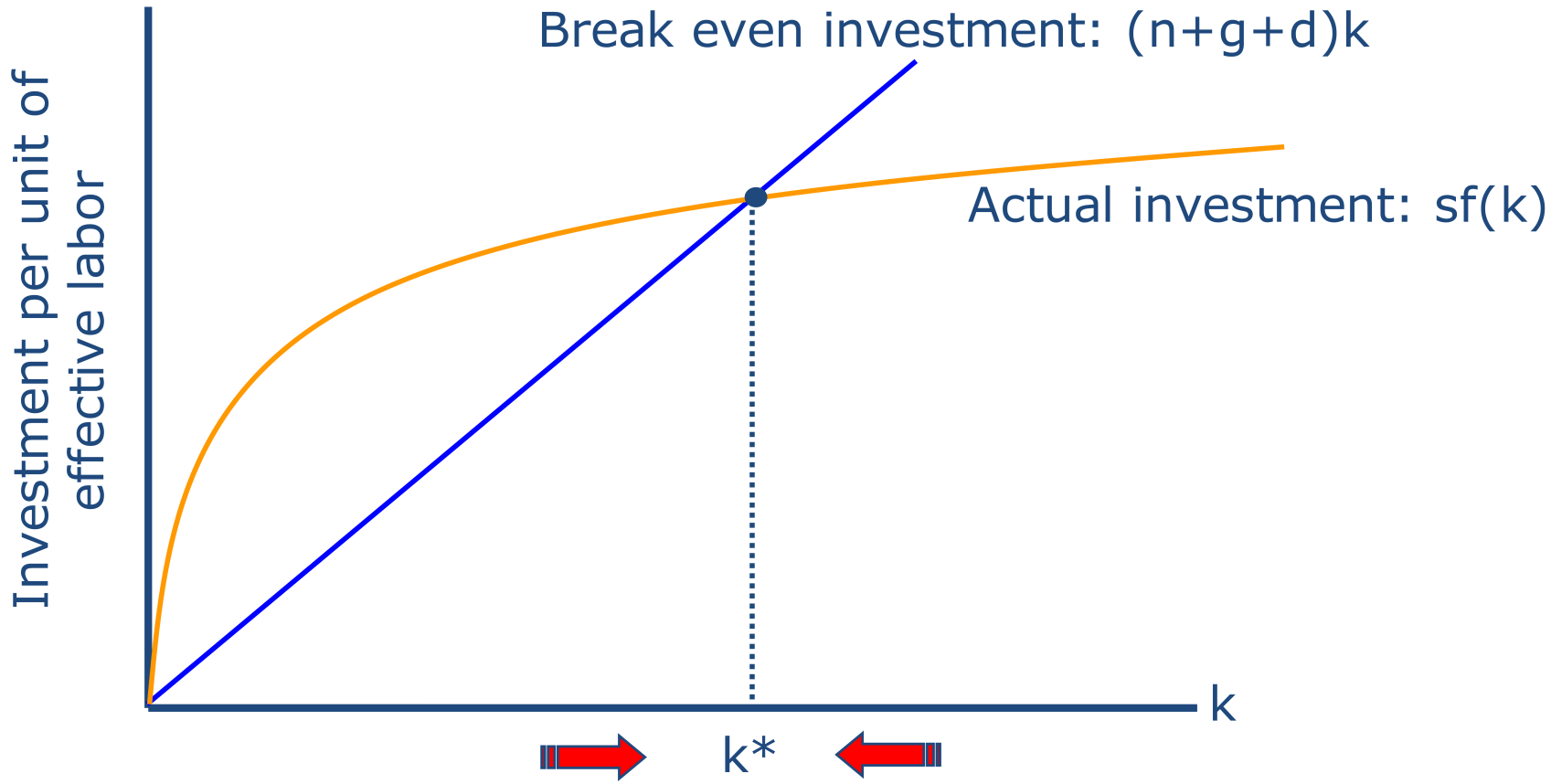
Fundamental equation of economic growth:

$$\dot{k} = sf(k(t)) - (d + g + n)\, k(t)$$

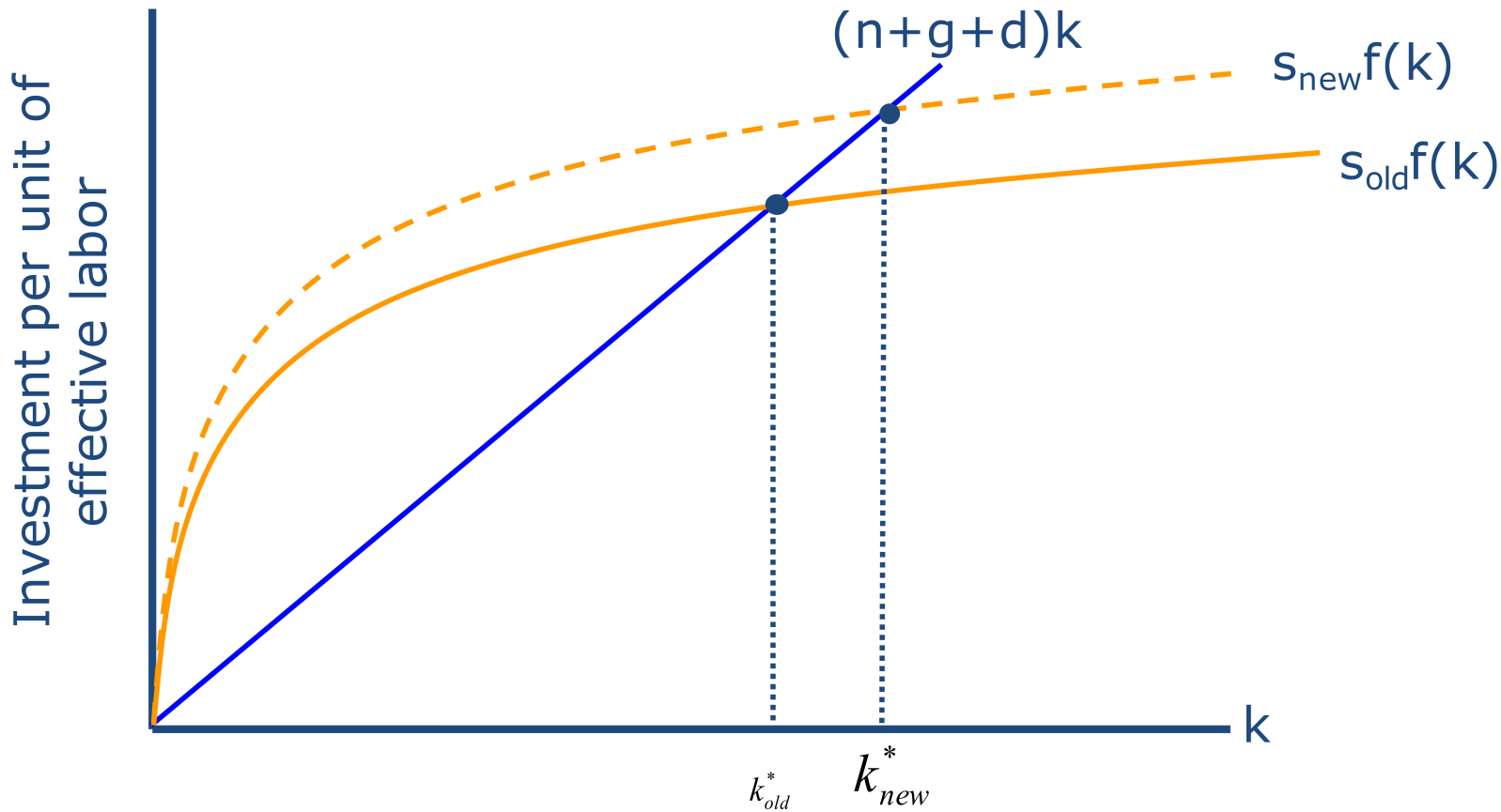
Rate of change in effective capital stock equals difference between

- actual investment, $sf(k)$
- break-even investment, i.e. amount of new investment required to keep capital stock unchanged despite depreciation, population growth and technological growth, $(d + g + n)\, k$

Solow (1956): steady state



Solow (1956): policy intervention $s \uparrow$



The one-sector growth model

- represents a powerful simplification of the macro economy
- an entire country represented by a single aggregate production function
  - no differentiation across types of goods
  - no differentiation across space
  - no differentiation across people
- nonetheless, hugely powerful workhorse model to study growth trajectories of entire countries or regions, i.e. at macro scale

Sources of growth in one-sector models

- Solow growth in per capita income has two potential sources:
  i. capital deepening (e.g. capital accumulation)
  ii. technological change (e.g. TFP growth)
- nuanced versions (and endogenous growth models) feature:
  - human capital as well as physical capital
  - innovation activity
  - resource use

Mechanisms of growth

- one-sector model offers only two growth mechanisms:
  - inputs (e.g. capital, human capital)
  - productivity (e.g. TFP, technology, innovation)
- other mechanisms beyond the above also plausible
  - Smith: growth through specialization and exchange
  - Lewis: growth through changes in composition of output

Smithian growth

- division of labour for single sector/good hardly meaningful
- with many goods and locations, Smithian growth possible:
  - different locations specialise in different goods for consumption
  - shift from subsistence production to specialized firms may involve productivity gains or scale economies
  - bounded by spatial frictions and transport cost
- Smithian growth (implemented via Ricardian trade) features in recent trade literature studying intranational trade (e.g. Allen and Arkolakis (2014), Donaldson (2018))

Lewis growth

- compositional changes in output require more than one sector
- generate growth by shifting resources from low productivity sector to high productivity sector
- no productivity growth required in either sector, only reallocation
- important to better understand mechanisms for both:
  - emergence of high productivity sector
  - drivers of and barriers to sectoral change

Re-reading the growth data

- different possible growth mechanisms force us to re-think or re-read the available growth data
- in one-sector model growth necessarily assigned to either 'factors' or 'productivity':
  - growth accounting exercises (e.g. Solow (1957)
  - 'development accounting' (e.g. Hall (1999), Caselli (2005)

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  - can re-think relative roles of factors, productivity and compositional changes (e.g. Restuccia et al. (2008))

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- no longer true in a multi-sector world:
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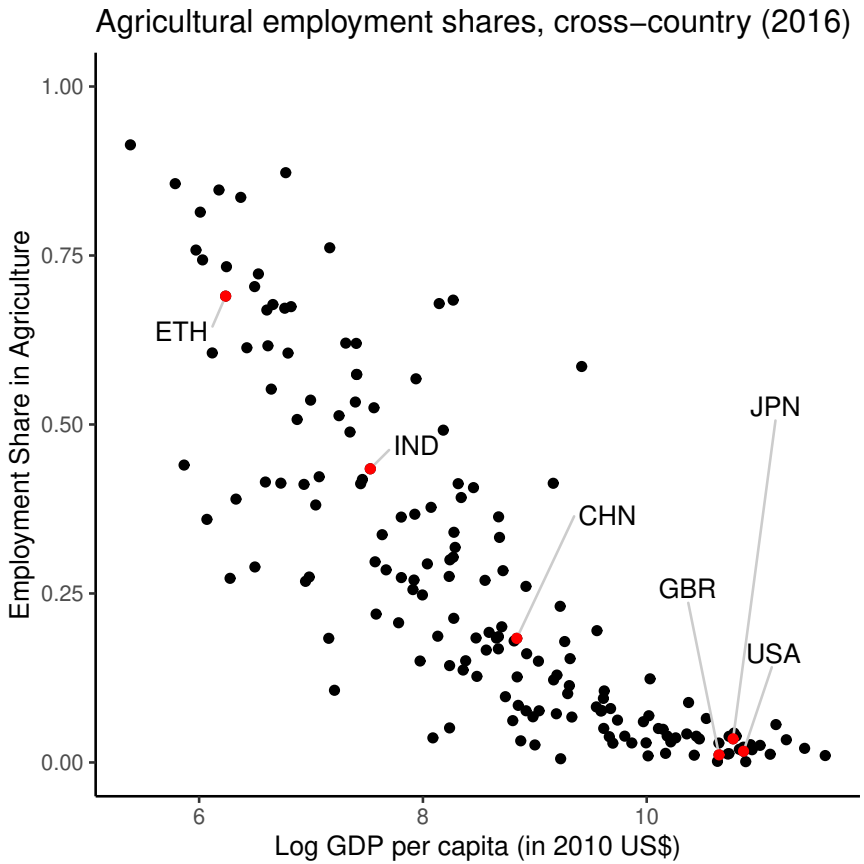
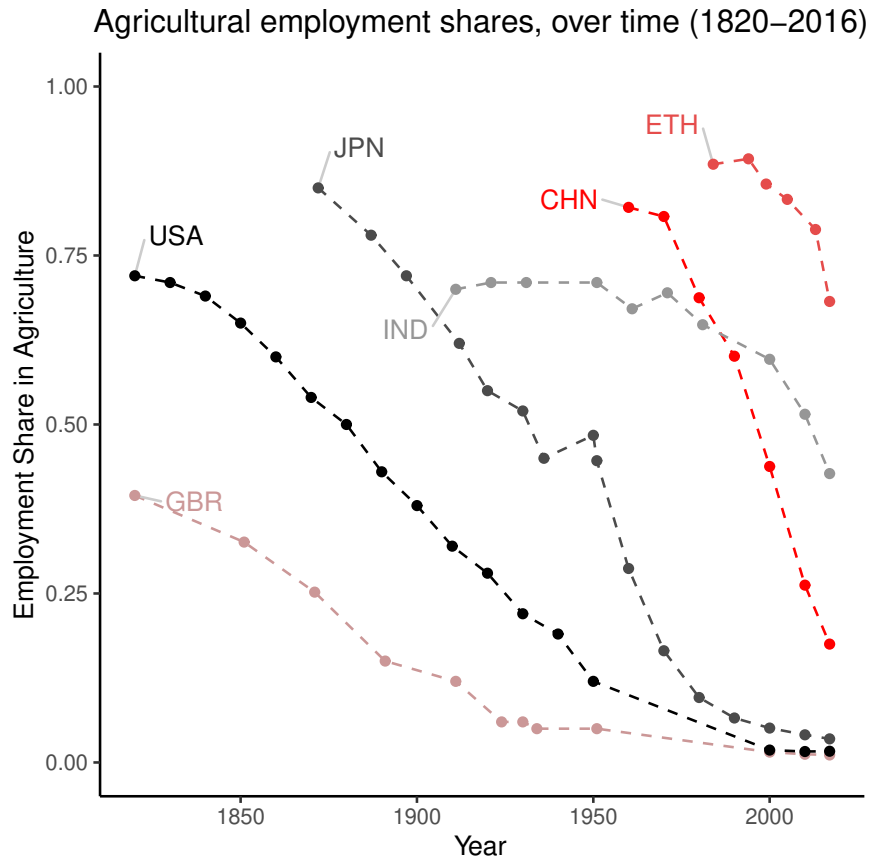
- note: can only understand data through the lens of a model
  - thus, our choice of model affects how data is read/interpreted

Development and structural transformation: agriculture ↓





Source: Moneke (2020), reproducing the Lewis'/Kuznet's facts of economic growth.

Definitions

- structural transformation defined as

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- can also include reallocation of activity in other dimensions:
  - across firms of different size and type (Kuznets, 1973)
  - in the 'complexity' of goods being produced (Hausmann, 2006)

Conceptual issues: measurement and definitions

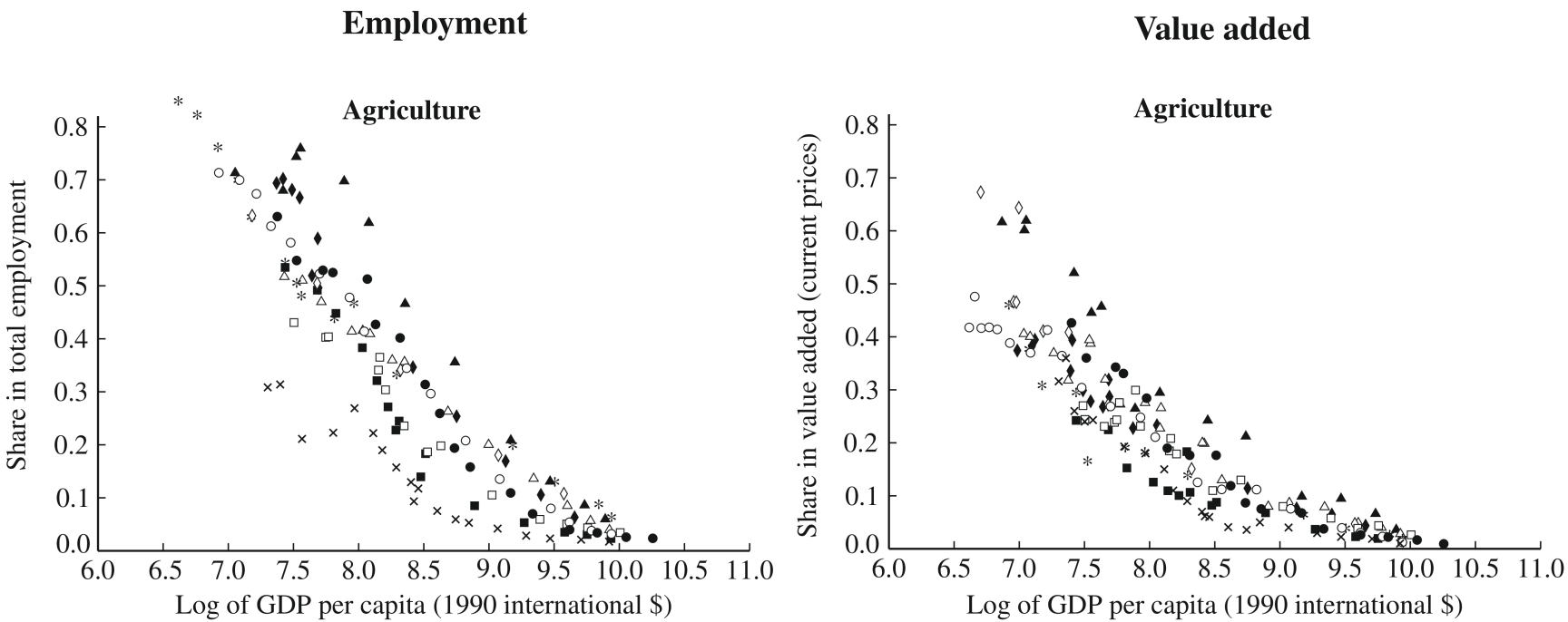
[cf. Herrendorf et al. (2014) for details]

- production measures vs consumption measures
- production:
  - employment vs value added
  - real vs nominal
- consumption:
  - real vs nominal

Stylized facts: sectoral changes

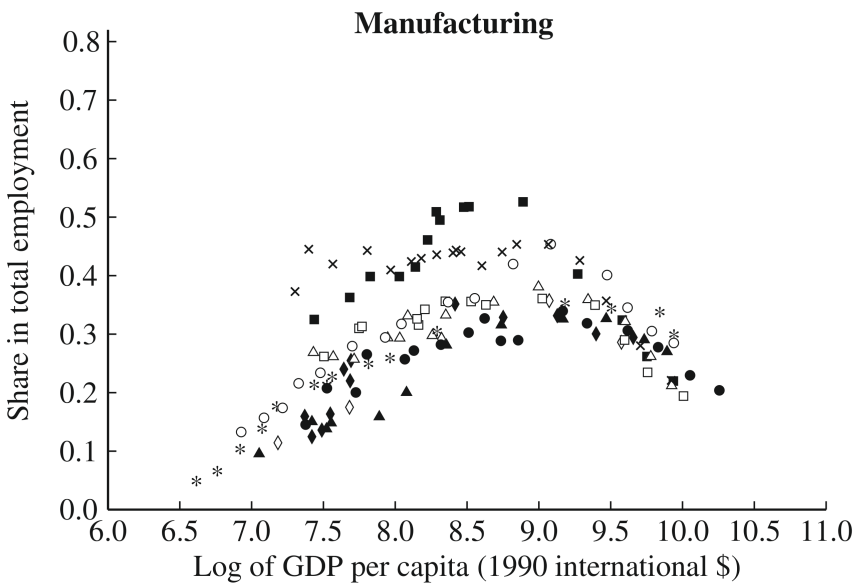
- famous empirical regularities of structural transformation:
  - declining shares of agriculture
  - increasing share of services
  - hump-shaped share of manufacturing
- robust to different measures and data sources

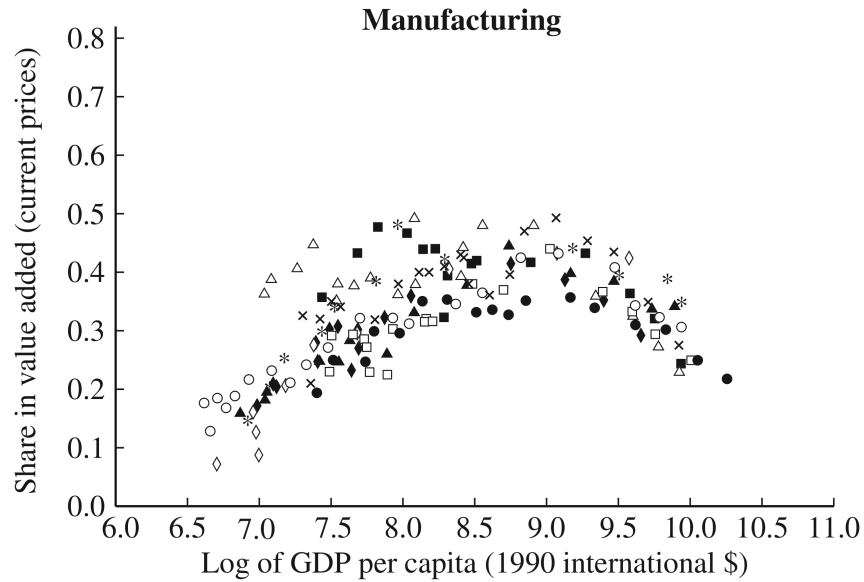
Structural transformation across GDP pc: agriculture



Source: Herrendorf et al. (2014), Figure 6.1, Panel 1.

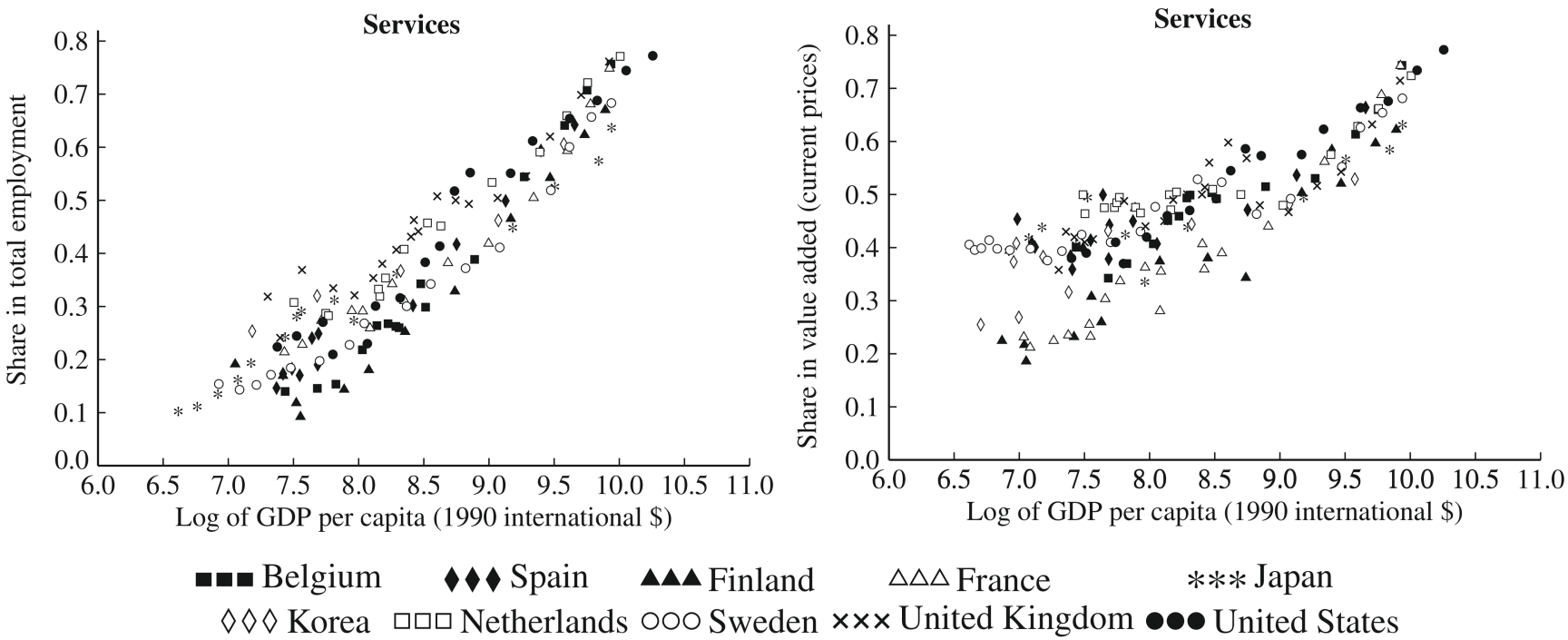
Structural transformation across GDP pc: manufacturing





Source: Herrendorf et al. (2014), Figure 6.1, Panel 2.

Structural transformation across GDP pc: services



Source: Herrendorf et al. (2014), Figure 6.1, Panel 3.

Points to note

- agriculture share of employment in poor countries seems to be systematically larger than the share of value added
  - implies low value added per worker, if it can be taken literally
  - puzzling since it also looks as though most workers in poor countries are in this low productivity sector
- employment and value added shares for services have a positive intercept
- value added share of services seems to take off at approximately the same income level that manufacturing share starts to fall

A sketch of the main themes

1. agriculture is the dominant sector in poor countries but not in rich countries
   - could simply reflect a transition within closed economies, due to non-homothetic preferences
   - alternatively, could reflect differential productivity growth in a closed economy
   - either way, transformation could be consistent with a perfectly efficient growth process
   - if so, poor countries can hope for a happy process of transformation and convergence
   - but not necessarily true if economies are open, rather than closed

A sketch of the main themes

1. agriculture is the dominant sector in poor countries but not in rich countries
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   - either way, transformation could be consistent with a perfectly efficient growth process
   - if so, poor countries can hope for a happy process of transformation and convergence
   - but not necessarily true if economies are open, rather than closed
2. agriculture has surprisingly low levels of productivity and high levels of poverty
   - could be innocuous, a result of mismeasurement of home production in rural areas
   - or could reflect frictions of various kinds

Mechanisms behind ST: non-homotheticity

- simplest way to model a transformation is to use a simple two-sector growth model with a minimum consumption requirement for agriculture
- delivers growth process in which the agriculture sector dominates when economies are poor, but diminishes as economies get richer
- relies on closed economy assumption
  - if economies are open, then the 'food problem' does not bind
- in such a world, agricultural productivity growth can drive the transformation process

Mechanisms behind ST: differential productivity growth

- alternatively, differential sectoral productivity growth could drive ST – also in a closed economy
- two issues crucial:
  - are the goods produced in different sectors effectively substitutes or complements?
  - which sector is experiencing faster productivity growth?
- variant of Baumol's cost disease story (originally in Baumol (1967)), generalised in Ngai and Pissarides (2007)

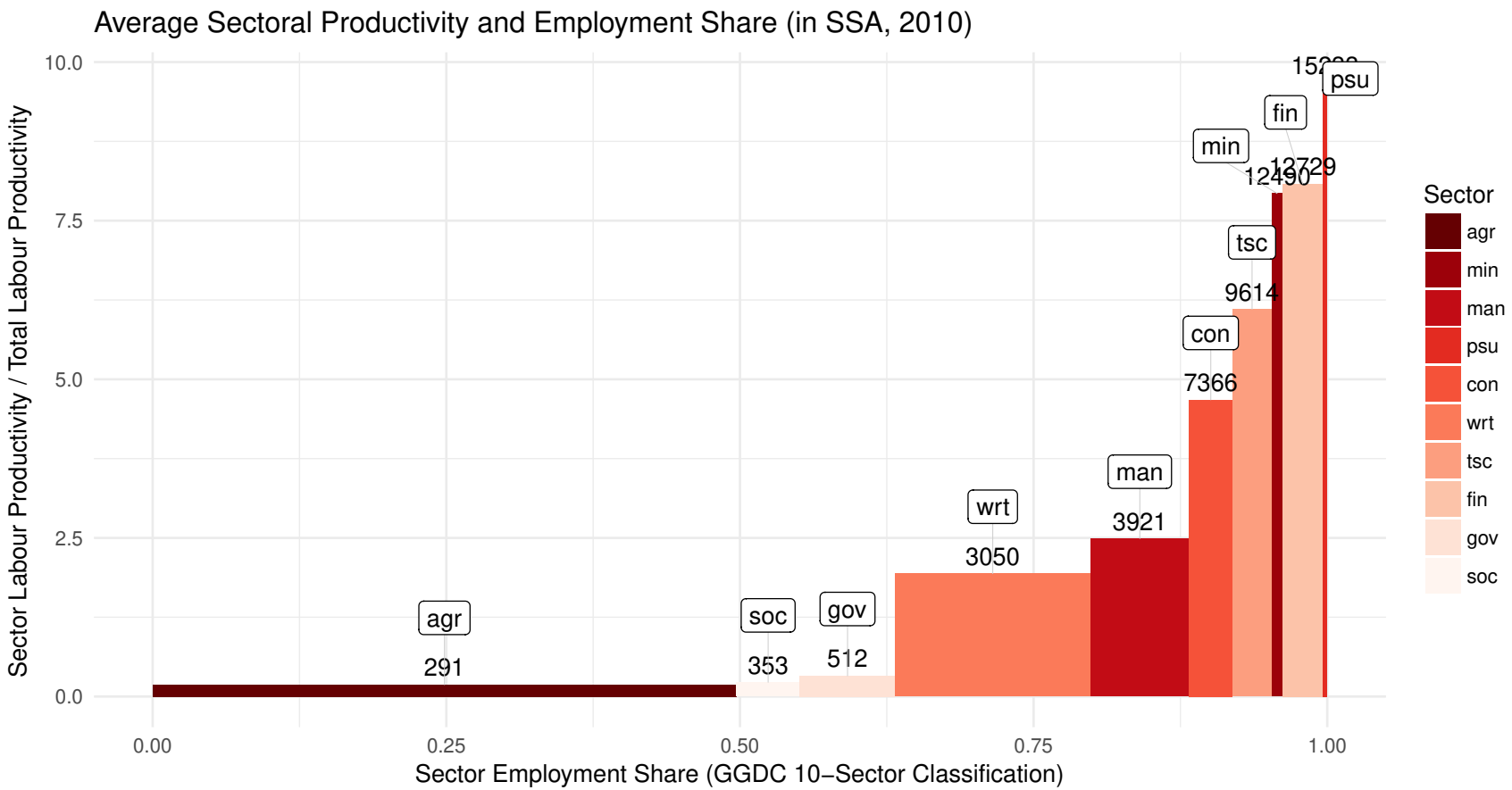
Mechanisms behind ST: differential productivity growth

- suppose the goods produced in the two sectors (agriculture and manufacturing) are perfect complements:
  - then the sector with faster productivity growth will shrink over time, shedding labour
  - fewer resources are needed to produce this good, and more will move to production of the good with slower growth
- conversely, consider the case where the two sectors produce perfect substitutes:
  - resources will move into the sector with the faster productivity growth
  - why bother producing the other good?

Mechanisms behind ST: does it matter?

- assessing which mechanism at play is hard
- prices may tell us something, but measuring prices is complicated
- both mechanisms suggest an *efficient* process of transformation
- in both cases, changing sectoral composition of output is a consequence of growth rather than a cause of growth
- however, the underlying mechanism may affect what we measure

Sectoral productivities across sub-Saharan Africa



Empirical background

- in much of sub-Saharan Africa (and in many of the world's poorest countries), large fractions of the population live in rural areas and work in quasi-subsistence agriculture

- productivity levels in this sector appear to be very low – both in absolute terms and relative to the non-agricultural sector

- by contrast, in rich countries, productivity appears to be approximately equal across sectors

- Ricardian comparative advantage suggests that countries should specialize in sectors that are relatively most productive, compared to the rest of the world.

$\rightarrow$ why are so many people in poor countries working in a sector where they appear to be so relatively unproductive?

Does mismeasurement explain the puzzle?

- one view is that we simply cannot believe the data

- Gollin et al. (2014) attempt to measure the productivity gaps using the best available theory and data
  1. are sectoral productivity differences merely illusory?
  2. can we improve measurement of productivity differences?
  3. do unexplained differences remain?

Agriculture sector in low income countries

- agriculture's share of employment high
- share of value added *systematically lower* than share of employment

$\rightarrow$ implies that VA/L lower in agriculture than in non-agricultural sector

The agricultural productivity gap in low income countries

- can define the Agricultural Productivity Gap (APG) as:

$$APG \equiv \frac{VA_n/L_n}{VA_a/L_a}.$$

- under some moderately restrictive assumptions, APG should be close to 1 – a useful benchmark
- typical developing country has APG of 4, but some have 8 or higher
- however, unclear if one can trust these highly aggregate numbers?

The agricultural productivity gap in low income countries

- in a mechanical sense, the differences in sectoral productivity can 'explain a great deal of cross-country differences in GDP per worker' (Caselli, 2005; Restuccia et al., 2008)
- taken at face value, gaps seem to suggest **misallocation**
- policy debate: should we encourage movement out of agriculture? Target the agricultural sector for productivity investments?
- Gollin et al. (2014) attempt to refine the **measurement** of productivity gaps and gain greater visibility on sources of error (and true extent of agricultural productivity gaps?)

Possible sources of measurement error

- sector differences in hours worked per worker?
  - construct measures of hours worked by sector for 51 countries
- sector differences in human capital per worker?
  - construct measures of human capital by sector for 98 countries
- shortcomings of national accounts data?
  - use household income/expenditure surveys from 10+ countries

Main results from Gollin et al. (2014)

- after adjustments, APG in average developing country reduced from 4 to 2.
- gaps are present in micro data as well as macro aggregates
- require a better understanding of why residual gaps so large

Simple two-sector model

- technologies: $Y_a = A_a L_a^{\theta} K_a^{1-\theta}$ and $Y_n = A_n L_n^{\theta} K_n^{1-\theta}$
- households can supply labor to either sector
- competitive labor markets, i.e. workers paid their marginal product
- equilibrium: $\text{APG} \equiv \frac{VA_n/L_n}{VA_a/L_a} = \frac{Y_n/L_n}{p_a Y_a/L_a} = 1.$

Computing "raw" agricultural productivity gaps

- measures of VA_a and VA_n.
  - value added, defined in 1993 System of National Accounts
  - source: World Bank, via country national accounts data

Computing "raw" agricultural productivity gaps

- measures of VA_a and VA_n.
  - value added, defined in 1993 System of National Accounts
  - source: World Bank, via country national accounts data
- measures of L_a and L_n: economically active population by sector
  - employed or unemployed persons who are working (or seeking work) in the production of some good or service recognized by the 1993 System of National Accounts
  - source: World Bank, via population censuses or labor force surveys

Summary statistics of raw agricultural productivity gaps

Measure	Weighted	Unweighted
5th Percentile	1.7	1.1
Median	3.7	3.0
Mean	4.0	3.6
95th Percentile	5.4	8.8
Number of Countries	113	113

Sector differences in hours worked: summary

- can explain on average a factor 1.2
- with only a few countries above 1.5

$\rightarrow$ unlikely to be the main cause of APGs in developing countries

Sector differences in human capital

- average human capital per worker could differ across sectors
- GLW (2014) construct human capital per worker by sector for 97 countries

  - years of schooling measured directly when available

  - impute years of schooling using educational attainment otherwise

  - baseline: assume 10% rate of return on year of schooling

$$h_{j,i} = \exp(s_{j,i} \cdot 0.10)$$

Quality differences in schooling

- rural schools often of lower quality than urban schools
- potentially *overstate* human capital among agriculture workers
- use literacy data to adjust for schooling quality

Adjusting the raw APG numbers: summary

- differences in hours worked contribute a factor of 1.2.
- differences in human capital contribute a factor of 1.4.

Now, put them all together and construct "adjusted" APGs.

Adjusted agricultural productivity gaps

Measure	Complete Data	All Countries
5th Percentile	0.8	0.7
Median	2.2	1.9
Mean	2.1	2.1
95th Percentile	3.9	3.9
Number of Countries	50	113

Comparing macro and micro data on sector value added

The idea:

- cross check 'macro' value added data from national accounts with 'micro' data from household income/expenditure surveys

The data:

- use World Bank's Living Standards Measurement Surveys (LSMS)
- explicit goal of LSMS: household income and expenditure measures

Measuring value added from micro data

Agriculture:

$$
\begin{aligned}
VA_a &= \sum_i y_{a,i}^{SE} + \sum_i y_{a,i}^{L} + \sum_i y_{a,i}^{K}, \\
y_{a,i}^{SE} &= \sum_{j=1}^{J} p_j \left(x_{i,j}^{home} + x_{i,j}^{market} + x_{i,j}^{invest} \right) - COSTS_{a,i},
\end{aligned}
$$

Non-agriculture:

$$
\begin{aligned}
VA_n &= \sum_i y_{n,i}^{SE} + \sum_i y_{n,i}^{L} + \sum_i y_{n,i}^{K}, \\
y_{n,i}^{SE} &= REV_{n,i} - COSTS_{n,i}.
\end{aligned}
$$

$$
i = \text{household} \quad \text{and} \quad j = \text{agriculture commodity}.
$$

Comparison of macro and micro APG

	Agriculture Share of				
	Employment		Value Added	APG	
Country	Micro	Macro	Micro	Macro	Micro
Armenia (1996)	34.2	36.8	32.8	0.9	1.1
Bulgaria (2003)	14.1	11.7	18.4	1.2	0.7
Cote d'Ivoire (1988)	74.3	32.0	42.1	4.7	4.0
Guatemala (2000)	40.2	15.1	18.7	3.8	2.9
Ghana (1998)	53.9	36.0	33.3	2.2	2.3
Kyrgyz Republic (1998)	56.9	39.5	39.3	2.0	2.0
Pakistan (2001)	46.9	25.8	22.6	2.5	3.0
Panama (2003)	27.0	7.8	11.8	4.4	2.7
South Africa (1993)	11.0	5.0	7.0	2.3	1.7

Conclusions from Gollin et al. (2014)

- typical developing country has large agricultural productivity gap
- better measurement reduces gap from around 4 to around 2
- large AGPs also present in household survey data

$\rightarrow$ require a better understanding of why residual gaps so large

Why are residual gaps so large?

- more measurement error?
  (e.g. Herrendorf & Schoellman (2011))
- selection of more productive workers out of agriculture?
  (e.g. Young (2013))
- risk or other barriers to migration?
  (e.g. Bryan et al. (2014))
- other disutility of urban areas, such as alienation, crime, pollution, social status?
  (e.g. Dercon et al. (2012))

Young's (2013) approach

- do 'gaps' reflect differences in *quantities* of factors or differences in *earnings per unit* of factors?
- different implications for policies: 'gaps' vs 'wedges'
  - wedges suggest misallocation or barriers that might be susceptible to policy interventions
- focus of the paper is to distinguish between the two explanations

Data and approach

- use data from DHS surveys for 65 countries to develop a set of comparable cross-country measures of living standards
- compare urban with rural standards
- also document migration from urban to rural and vice versa
- use Engel curves estimated from household educational attainment and living standards measures from DHS

Key findings

- inequality between rural and urban areas is a major source of inequality
  - 40% of within-country inequality
  - much of the cross-country variation in levels of inequality
  - "countries with unusually high levels of inequality are countries where the urban-rural gap is unusually large."
- dispersion *within* rural areas is roughly the same as dispersion *within* urban areas
- inequality in educational attainment is not a large source of total inequality

Findings on migration

- claim that 20-25% of individuals raised in rural areas migrate to urban areas as a young adult
  - migrants are better educated than those who stay in rural areas
- also finds that 20-25% of individuals raised in urban areas migrate to a rural area as a young adult
  - migrants are less educated than those who stay in urban areas
- migrants in both directions end up with consumption levels that are typical of the destination location

Conclusions from Young (2013)

- migration between rural and urban areas is creating a sorting mechanism through which high-skill people end up in cities and low-skilll individuals end up in rural areas
  - because education levels are not very different, 'skill' differences are really due to differences in ability
- presents a model in which rural-urban gaps are based on sorting on unobservable skill
- cities are places that favour high-ability people, i.e. the ability premium is high in cities
- if true, rural-urban gaps are simply reflecting sorting, not misallocation.

$\rightarrow$ gaps, but not wedges!

One step further? Hamory et al. (2021)

Are productivity gaps causal or mainly a reflection of differences in (observed/unobserved) worker characteristics?

- GLW (2014) imply large income gains from workers moving out of agriculture
- Young (2013) documents large consumption gaps across urban/rural areas, but posits that there exists efficient sorting of individuals by type

Hamory et al.'s (2021) empirical test

- limitation of both GLW (2014) and Young (2013) is lack of panel data on individual productivity in different sectors
- ideal thought experiment: pick people up and move them across sectors, and measure their productivity, consumption, etc., to estimate the sectoral premium

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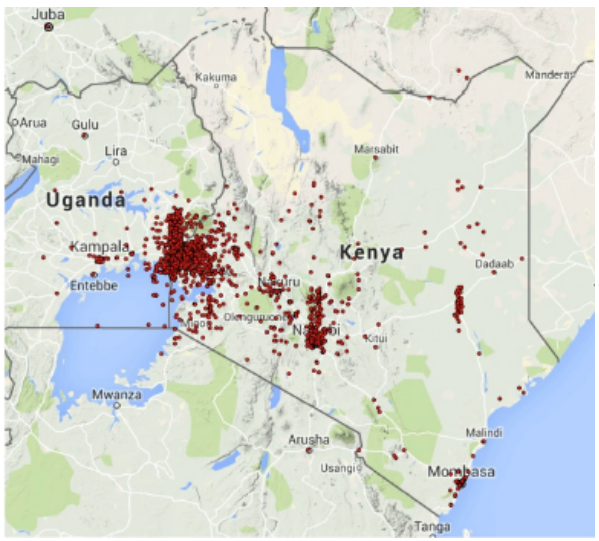
Use long-term panel data to measure productivity of same person in both agricultural (rural) and non-agricultural (urban) sectors:

- data from Indonesia and Kenya, where such long-term panel data with individual high tracking rates exists
- estimate gap for movers: does differencing out individual fixed effects narrow – or widen – productivity gaps? How important is selection into migration?

Data

Indonesia Family Life Survey
- 1988 - 2015
- 31,843 individuals
- 5,086 with separate urban-rural obs

Kenya Life Panel Survey
- 1998 - 2014
- 4,791 individuals
- 1,037 with separate urban-rural obs

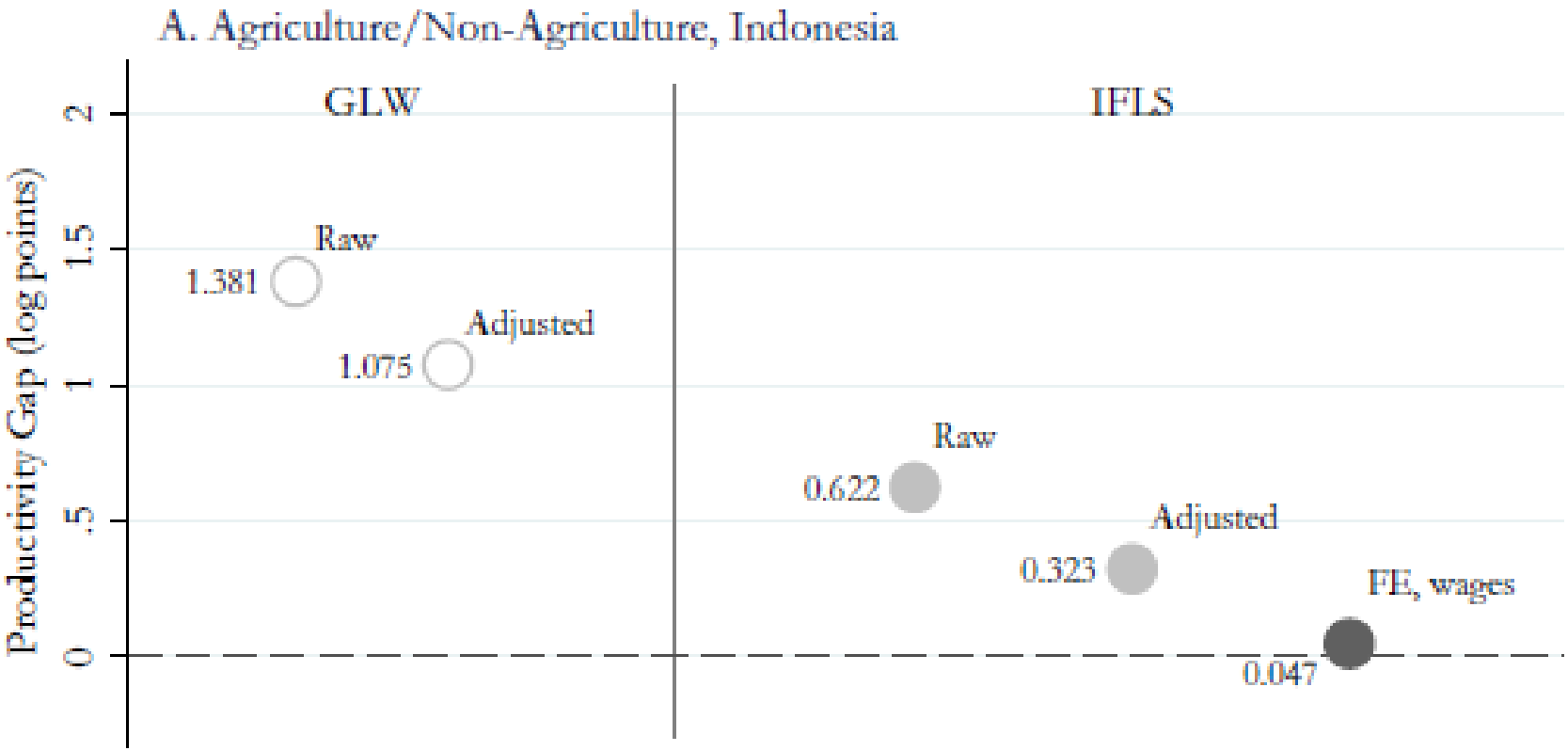


Current and retrospective annual data on location, income, employment, including from informal and family businesses

Who migrates?

	All N=18211	Always Rural N=10592	Rural-to-Urban Migrants N=1985	Always Urban N=2606	Urban-to-Rural Migrants N=3028	Obs
Primary Ed.	0.800	0.722	0.902	0.960	0.872	18211
	[0.400]	[0.448]	[0.297]	[0.196]	[0.334]	
Secondary Ed.	0.285	0.172	0.357	0.575	0.383	18211
	[0.451]	[0.377]	[0.479]	[0.494]	[0.486]	
College	0.071	0.033	0.087	0.190	0.096	18211
	[0.258]	[0.178]	[0.282]	[0.392]	[0.294]	
Female	0.421	0.412	0.424	0.439	0.436	18211
	[0.494]	[0.492]	[0.494]	[0.496]	[0.496]	
Raven's Z-score	0.003	-0.117	0.121	0.315	0.119	11220
	[0.961]	[0.957]	[0.939]	[0.886]	[0.967]	

Main productivity gap estimates



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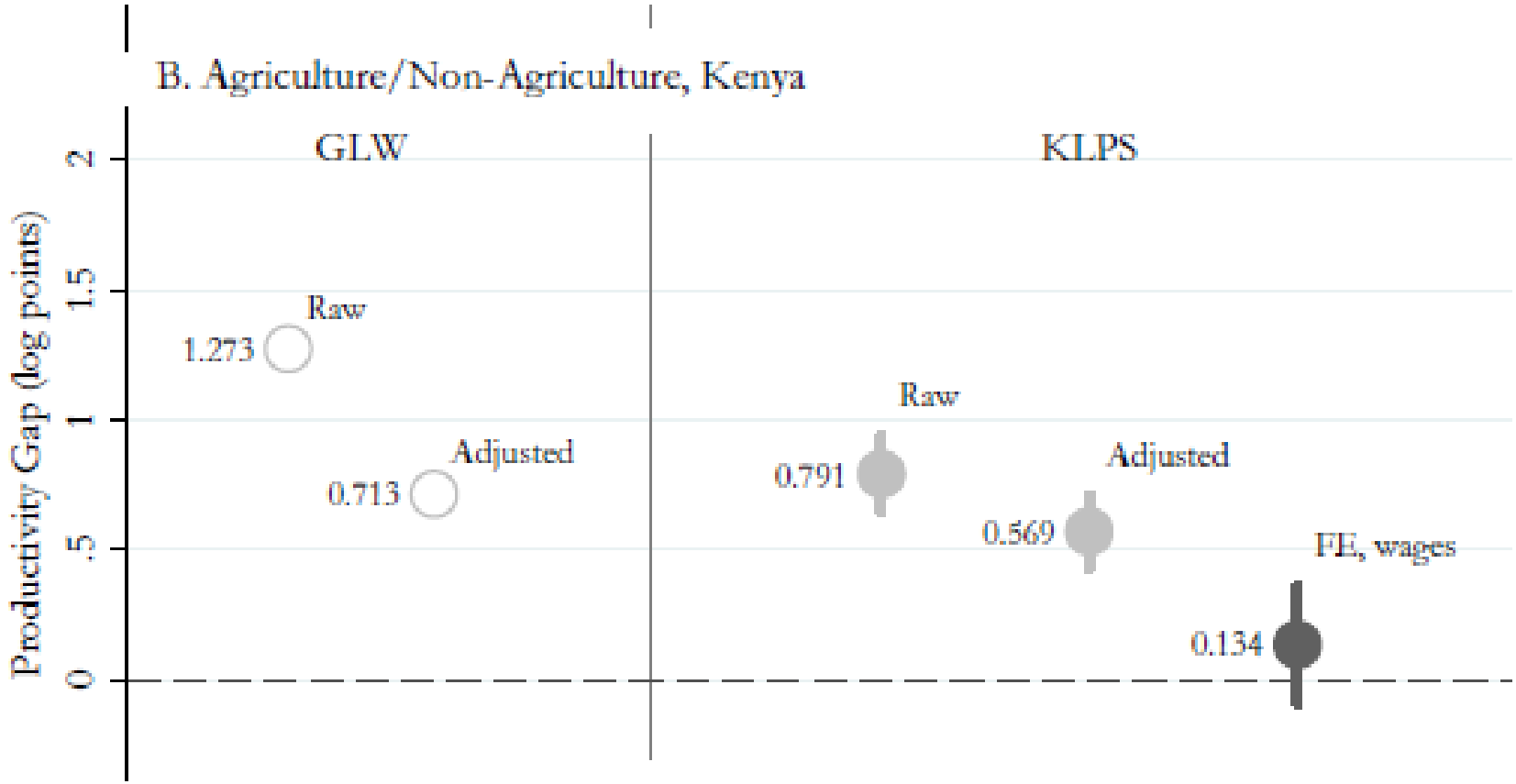

Conclusions from Hamory et al. (2021)

Are these productivity gaps causal or do they reflect differences in observed/unobserved worker characteristics?

- careful macro-empirical work unable to eliminate AGP
- however, inclusion of individual fixed effects reduces productivity gaps across sectors by 80 to 100%
- results similar for both countries, for agr./non-agr., for urban/rural

$\rightarrow$ individuals in Indonesia and Kenya who move to urban areas / into non-agr. sector, do not experience large wage gains

$\rightarrow$ large share of workers remaining in rural agriculture may not be a puzzle after all

Caveats

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- caveat (I): sample of two countries – productivity gaps could be larger in other settings
- caveat (II): FE captures local average treatment effect on movers – returns to migration could be quite different for non-movers (who may be constrained from moving)
  - migration choice is non-random
  - compare with Bryan et al.'s (2014) migration subsidies, who find important consumption gains among sending household members (~30% IV estimate) and earnings gains (~25% ITT estimate) among temporary seasonal migrants
  - note: gains also much lower than in Gollin et al. (2014), so seasonal migration probably a different decision than permanent migration (and 80% fail to be encouraged to move)

Discussion

- why are average gaps so large across sectors? measurement vs real underlying puzzle
- time horizons of productivity gains from sectoral change?
- alternatively, waves of highly selected migration (combined with partial heritability of cognitive ability) may have reshaped the underlying ability distributions across sectors:

	Always Rural	Always Urban	Gap
Secondary Education	26%	61%	35%
Normalized Raven's score	-0.14	0.19	0.33

Home to market gaps (Dinkelman & Ngai, 2022)

- many low income countries are still in early stages of ST
- overlooked feature: activities once conducted within household get outsourced to market
- particularly relevant for women's time use
- female LFP high in sub-Saharan Africa, but most time spent on home (not market) production
- potential lack of infrastructure to facilitate home-to-market transition?

$\rightarrow$ Dinkelman and Ngai (2022) highlight how today's transition from home to market closely resembles historical US experience

Female labour supply and ST closely intertwined

- Ngai et al. (2022) show female employment in US follow U-shape over time
- can directly relate U-shaped labour supply to process of structural transformation:
  - during early stages of development, reallocation of labour from female-intensive agriculture into male-intensive manufacturing (early stages of development)
  - later, reallocation of labour from male-intensive manufacturing into female-intensive services

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- structural transformation out of agriculture mainstay of development
- productivity gaps across many specifications and samples large and puzzling
  - agriculture vs non-agriculture
  - rural vs urban
  - home vs market
  - self-employed vs employed
- distortions to reallocation of economic activity loom large
- however, individual selection/sorting into sectors clearly relevant, may indicate absence of frictions/market failures

$\rightarrow$ overall, a major area of current research

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