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FULBRIGHT SCHOOL OF
PUBLIC POLICY AND MANAGEMENT

Manufacturing and Economic Growth

Development Policy
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Nicholas Kaldor: Manufacturing and *dynamic* increasing returns to scale



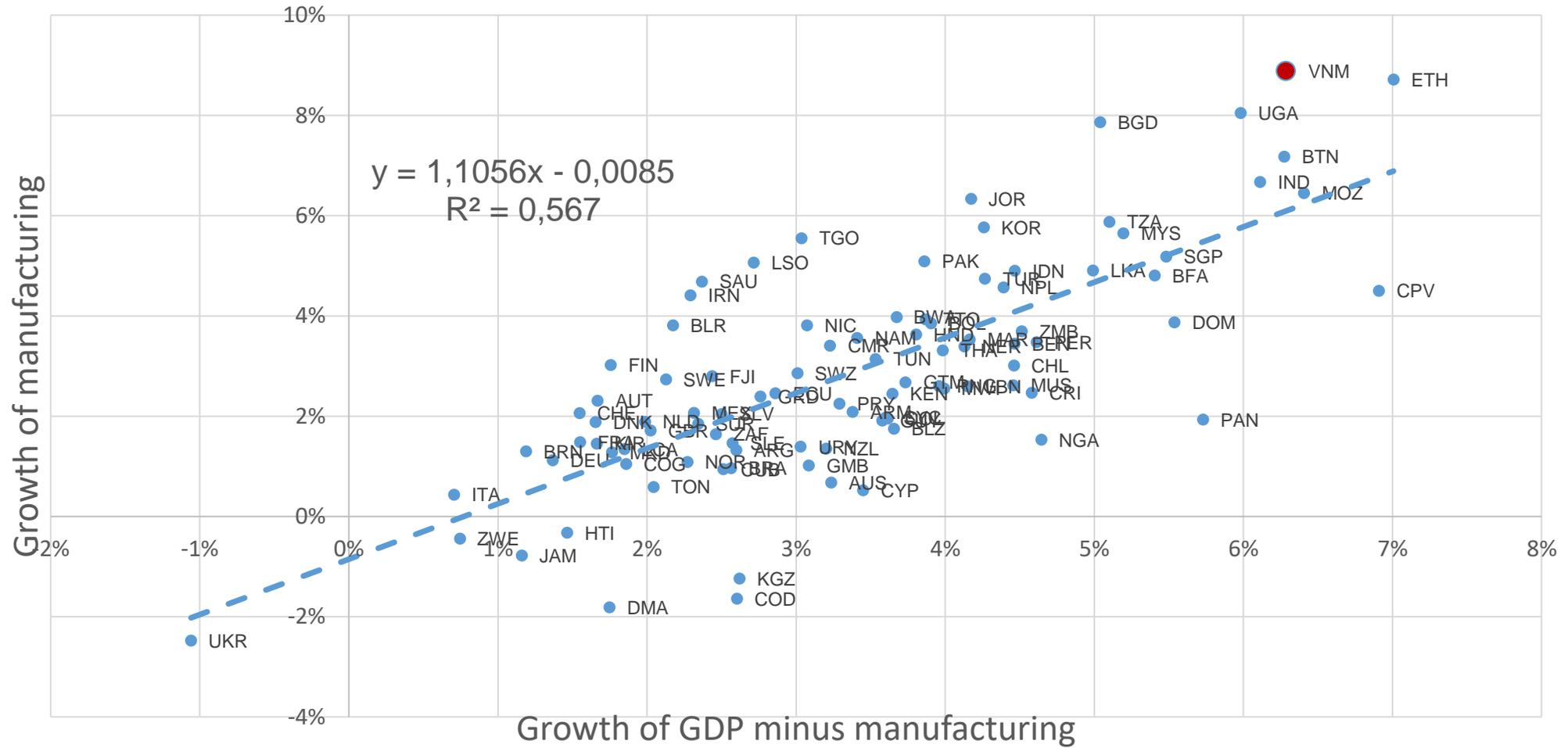
- Explaining why growth rates differ across countries
- One-sector models do not differentiate between activities with increasing returns and activities with constant or diminishing returns
- Manufacturing is unique in its capacity to realize dynamic increasing returns: productivity related not just to level of output but its rate of growth
- Supply does not always equal demand
 - Investment is exogenous
 - Export demand for manufactured goods is needed to achieve increasing returns and productivity growth (remember Adam Smith)
 - Growth of agriculture is an important source of demand (remember Mundle and the home market for industrial goods)



Nicholas Kaldor



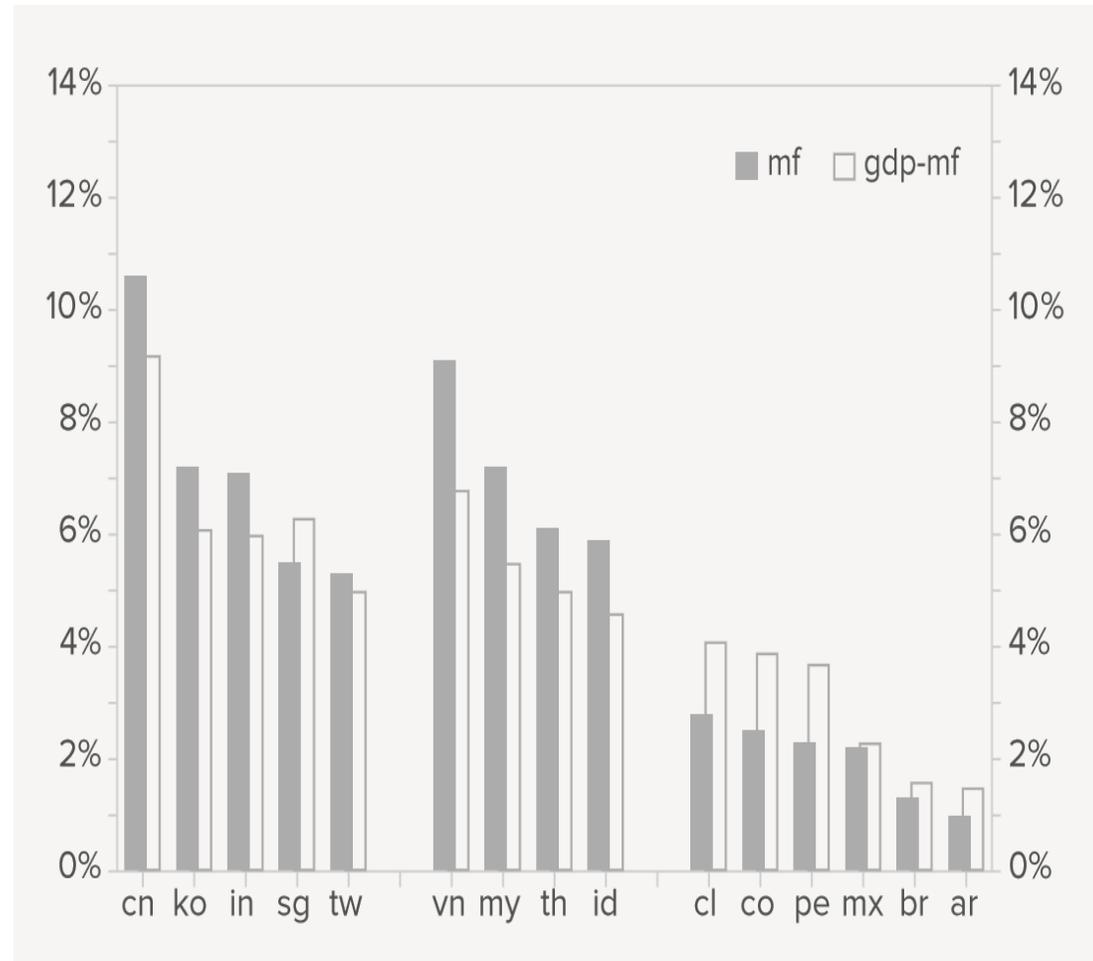
Manufacturing and GDP growth 1991-2019





Kaldor's First Law of Growth: Growth of manufacturing accelerates GDP growth

- GDP growth of manufacturing closely associated with growth of non-manufacturing GDP
- Asian countries with rapid growth of manufacturing achieved rapid growth in the rest of the economy.
- Latin American countries with slow manufacturing growth grew more slowly.



Source: Palma and Pincus, 2022

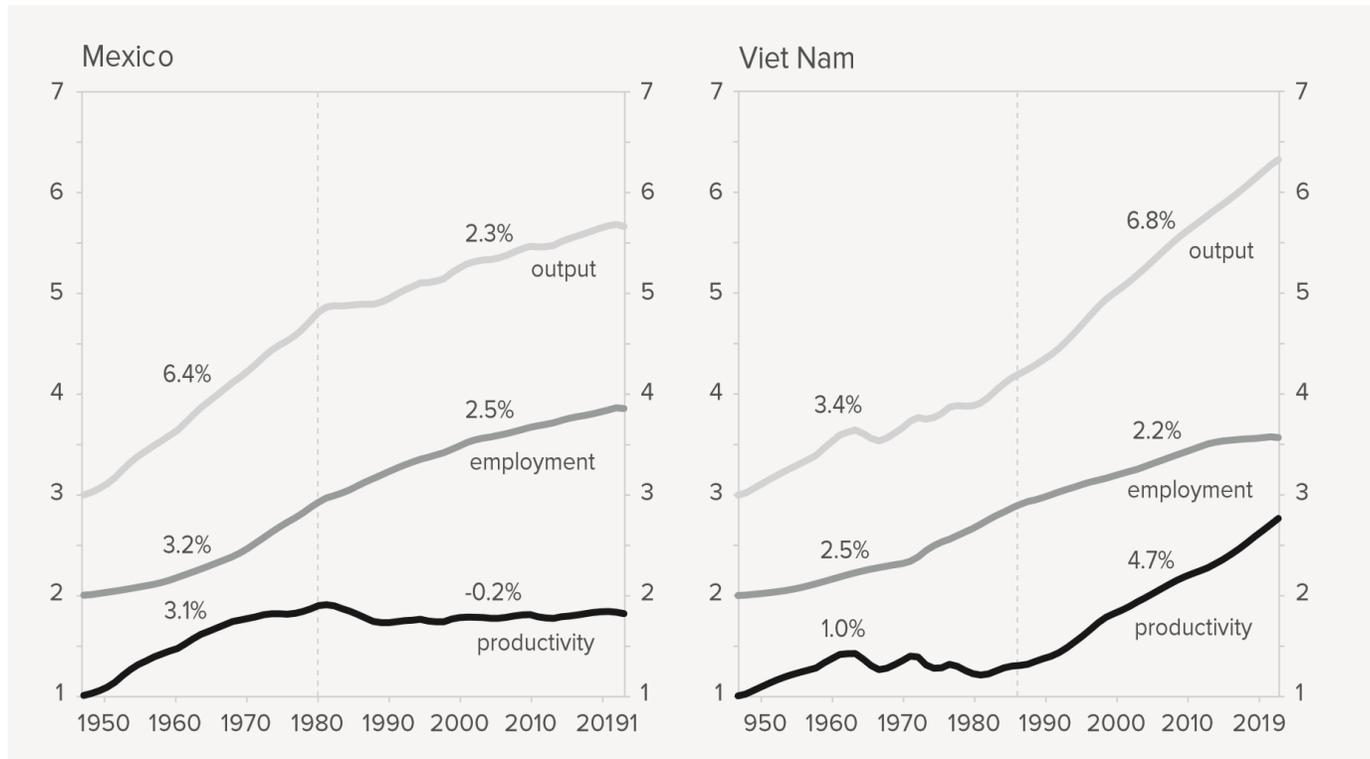


Why does manufacturing drive GDP growth?

- Movement of labor between sectors:
 - Lewis processes of labor moving from tradition to modern sectors
 - Labor moves from low productivity occupations in agriculture and traditional services (domestic service) to higher productivity manufacturing.
- Static productivity gains within manufacturing: Increasing returns to scale using the same technology
- Dynamic productivity gains: Spillover effects and learning by doing (remember endogenous growth theory)
- Rapid economic growth when sectors with rising productivity create jobs
- Slow growth when sectors with rising productivity create few jobs (mining, financial services)



Productivity and job creation are the keys to growth

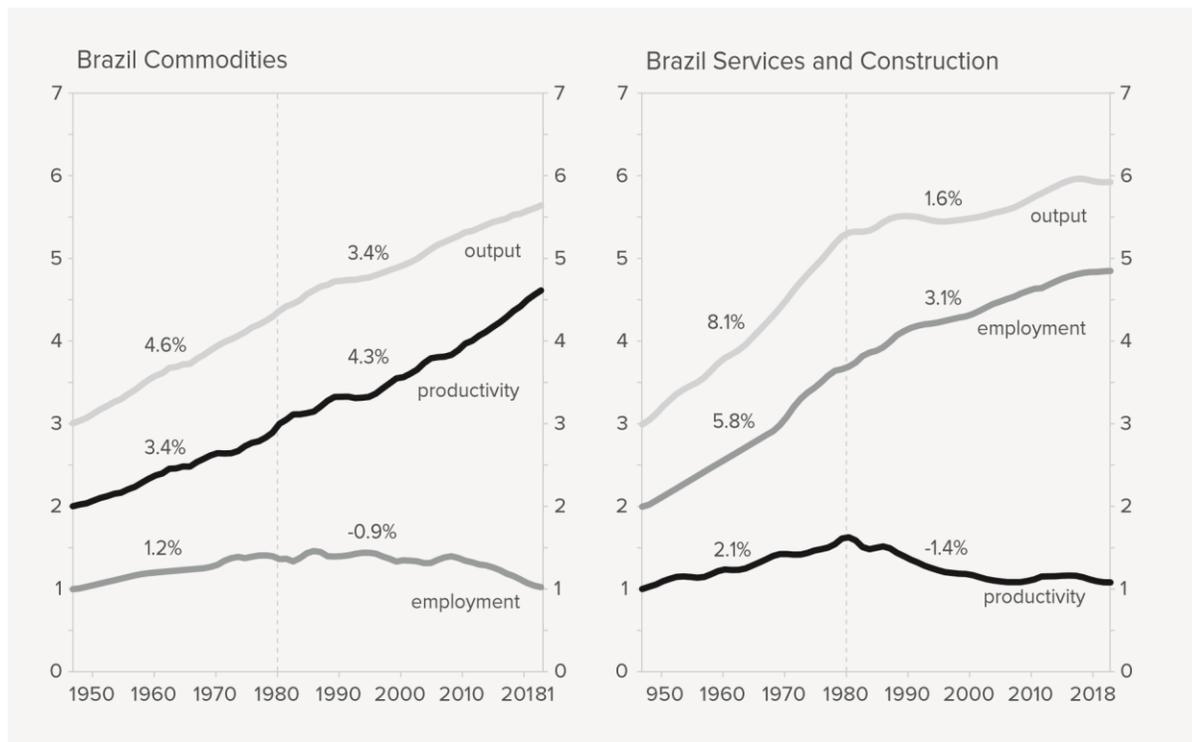


Source: Palma and Pincus, 2022

- Rapid growth depends on productivity growth in sectors that are generating employment
- Countries that achieve productivity growth and employment growth in the same sectors achieve output growth



Productivity and job creation are the keys to growth



Source: Palma and Pincus, 2022

- Brazil achieved rapid growth of productivity in the commodities sector, but this sector did not create jobs
- The result was slow GDP growth over the period

Kaldor's Second Law: Rapid growth of manufacturing drives productivity growth in the manufacturing sector

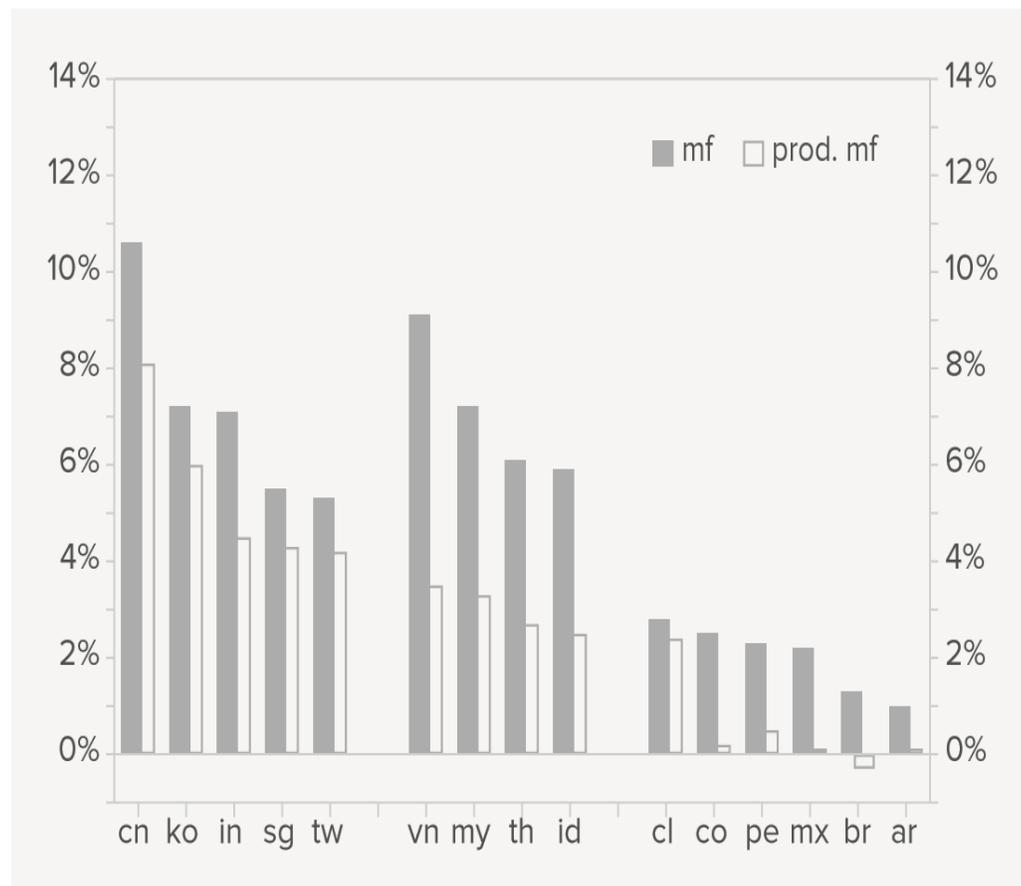


- Verdoorn's Law: Faster output growth in manufacturing is associated with faster productivity growth
 - Productivity growth = $a_1 + b_1 \cdot \text{manufacturing output growth}$
 - Employment growth = $a_2 + b_2 \cdot \text{manufacturing output growth}$
- The first equation says that productivity growth is a function of output growth
- Second equation: b_2 less than one \rightarrow meaning that we are adding labor at a rate that is less than the rate of output growth
 - Faster output growth induces investment in new machines (with new technologies)
 - Workers learn how to use the new machines and improve processes when they are called on to produce more



Kaldor's Second Growth Law

- Productivity growth in manufacturing speeds up when manufacturing output speeds up
- East Asia has achieved more rapid productivity growth in manufacturing than Southeast Asia, which still relies heavily on labor-intensive assembly operations.



Kaldor's Third Law: Rapid growth of output in manufacturing causes productivity growth in agriculture and traditional services

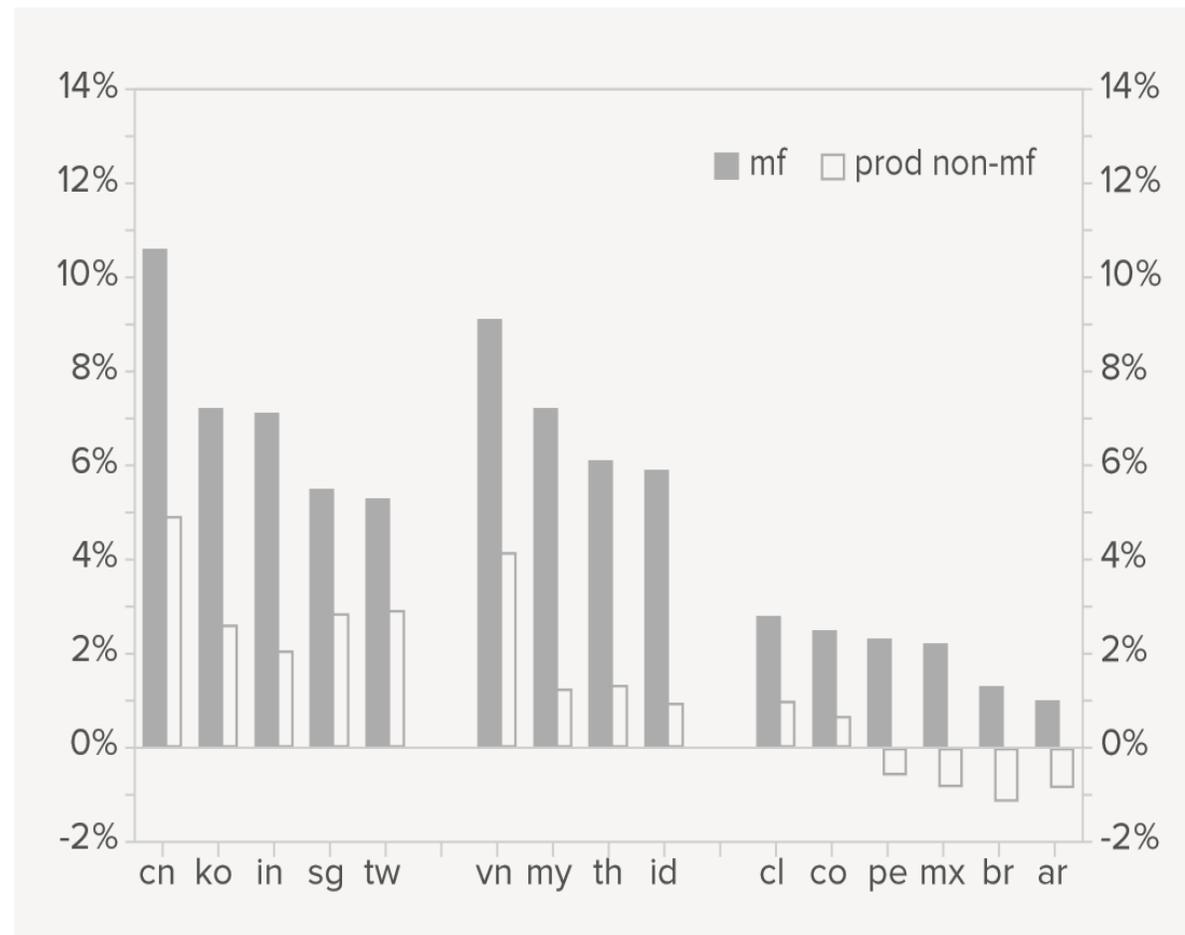


- Diminishing returns to scale in agriculture and traditional services
- When labor moves into manufacturing, labor productivity (output per person) rises in agriculture because fewer people are crowding in
- But as surplus labor is exhausted in agriculture, the gap in productivity between manufacturing and agriculture closes.
- This is why low income countries grow faster than rich countries (recall the Lewis model and what happens when surplus labor is exhausted).



Kaldor's Third Law

- Countries where manufacturing is growing rapidly record higher rates of productivity growth outside of manufacturing
- Where manufacturing is growing slowly labor gets “stuck” in agriculture and traditional services





A simple test of Kaldor's Laws

- Growth of manufacturing and transfer of labor from agriculture drive productivity growth in developing countries
- For 61 developing countries 1990-2017 (for which we have data)
- Prod growth = 0.4 (growth of manuf VA) – 0.3 (growth of ag employment)
- (6.8) (4.0)
- $R^2 = 0.50$
- Figures in parentheses are t-stats



Sustaining investment in manufacturing

- Requires government support in the form of physical and social infrastructure
 - Ports, airports, roads, power
 - Universal access to education, health care
- Removing barriers to investment
- Access to long-term finance at reasonable cost
- Predictable and fairly enforced rules and regulations
- Help with acquiring and mastering new technologies
- An overvalued exchange rate makes manufactured exports uncompetitive
- India: reserved some products for small businesses in the name of fairness, but hurt the poor because of slow job creation and productivity growth



Getting incentives right

- Natural resource exporters: Investors crowd into mining where profits are high and technological barriers low (Indonesia)
- Speculation and rents: Policies are needed to reduce windfall gains from speculating in property and financial assets
- Oligopolistic economies: When economic power is concentrated, big businesses make profits through monopoly pricing and turn away from manufacturing (Philippines)
- Foreign direct investment is important at the early stages of development for access to foreign markets and to move labor from agriculture to industry



Dynamic increasing returns in agriculture and services

- Manufacturing is no longer unique: dynamic increasing returns to scale are available in agriculture and services.
- “Servicification” of manufacturing and digital technology: Where does manufacturing end and services begin on your iPhone?
- Some activities previously regarded as manufacturing are now listed as services because they are subcontracted (research, design, testing)
- Increasing returns to scale in financial services, wholesale and retail trade, communications
- Modern agricultural technology: Factory farming



Policy implications

- Manufacturing is unique in its capacity to realize productivity growth through increasing returns to scale
- Demand side factors are important—Say's Law does not hold
- Sustaining productivity growth in agriculture is vital to sustain growth of manufacturing
- Learning new technologies is not easy: government must support social overhead and technology development
- Growth is fastest when sectors achieving high rates of productivity growth are also creating new jobs



Discussion questions

- Do Kaldor's three growth laws apply to conditions in Vietnam?
- What policies are needed to ensure that Vietnam can continue to achieve high rates of growth in the manufacturing sector?