

Beyond Krugman:
The Importance of Agriculture for East Asian Growth

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What caused Asia's rapid growth? In his seminal 1957 study of output growth per worker in the United States, Robert Solow invented growth accounting: the distinction between output growth due to increasing the quantity of inputs used and that due to raising the amount of output obtained per unit of these inputs. Solow said that only 12.5% of US growth was due to increasing capital per head of population. The other 87.5% was due to an unexplained residual he called technical progress.

In his 1994 *Foreign Affairs* article, "The Myth of Asia's Miracle", Paul Krugman claimed that the opposite was true of Asia. He said Asia's growth was due almost entirely to *perspiration* rather than *inspiration*.

Perspiration meant two things:

- increasing labor force participation – more labor per head of population;
- adding physical and human capital to raw labor.

Krugman claimed there was almost no residual (technical progress) in Asia and that rapid economic growth was unsustainable because of diminishing returns.

But Krugman missed something important. He never mentions agriculture.

His argument was based on earlier empirical studies by other scholars. These empirical growth accounting studies had focused mainly on data for Singapore and Hong Kong.

These city states differ from most of East Asia in that they lack low-productivity traditional agriculture. They import nearly all their food. Does this make a difference?

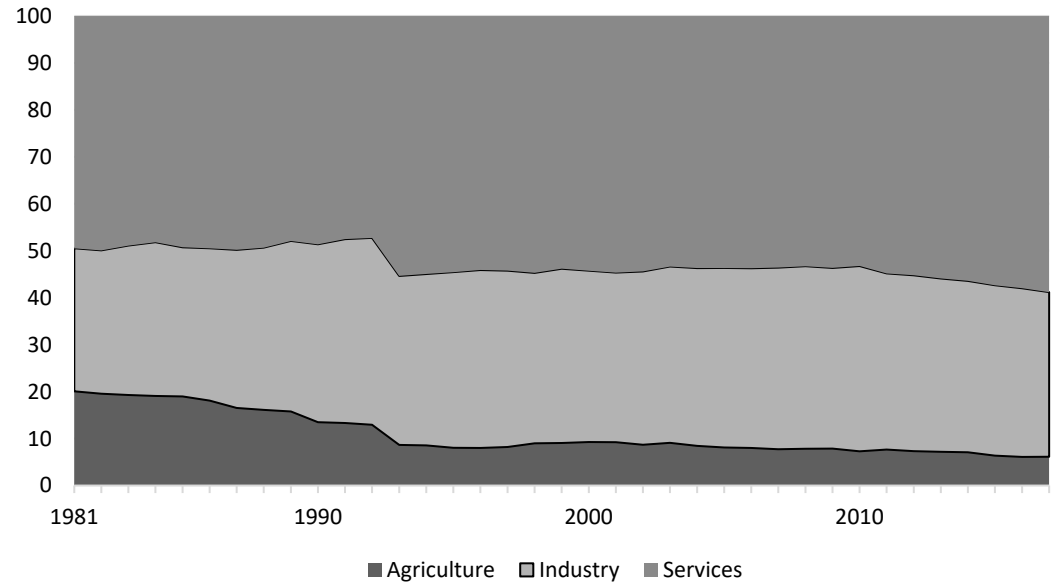
We are going to look at the data for Thailand and Indonesia, both of which are far more typical of East Asia than Singapore or Hong Kong.

I am going to argue that the movement of people out of low-productivity agriculture to higher productivity industry and services is a major source of Asian growth that Krugman overlooked. He got the story of Asian economic growth wrong because his argument was based on data for countries that are not typical of Asia.

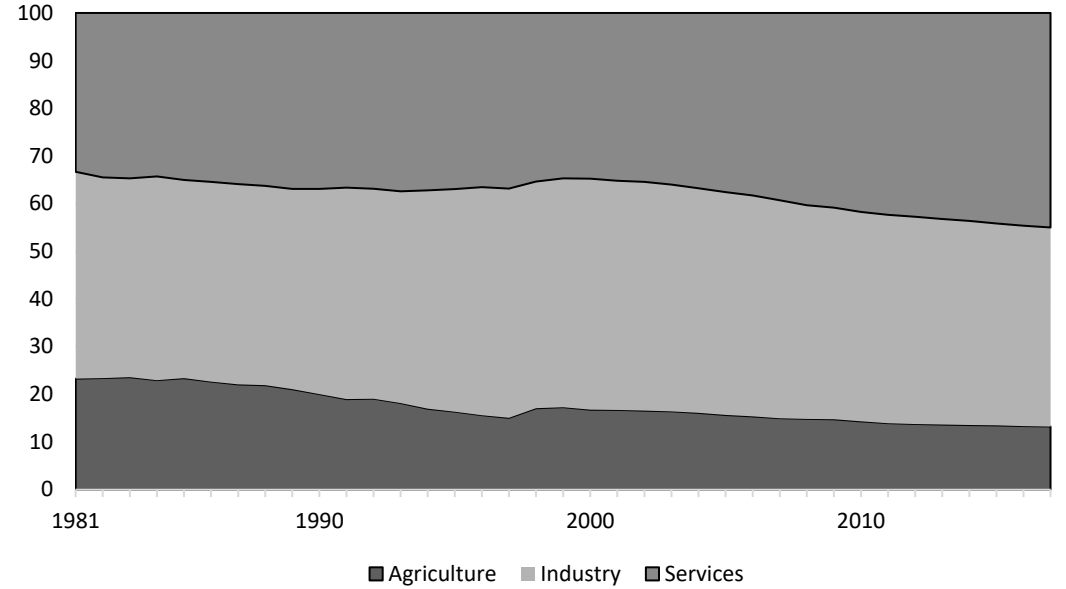
Agriculture's contraction and industrialization component, 1981–2017

Country	Output share		Employment share	
	Mean annual change of agriculture's % GDP share	Industry expansion as % agriculture's contraction	Mean annual change of agriculture's % employment share	Industry expansion as % agriculture's contraction
	[1]	[2]	[3]	[4]
Thailand	-0.39	33	-1.02	34
Indonesia	-0.28	0	-0.71	32

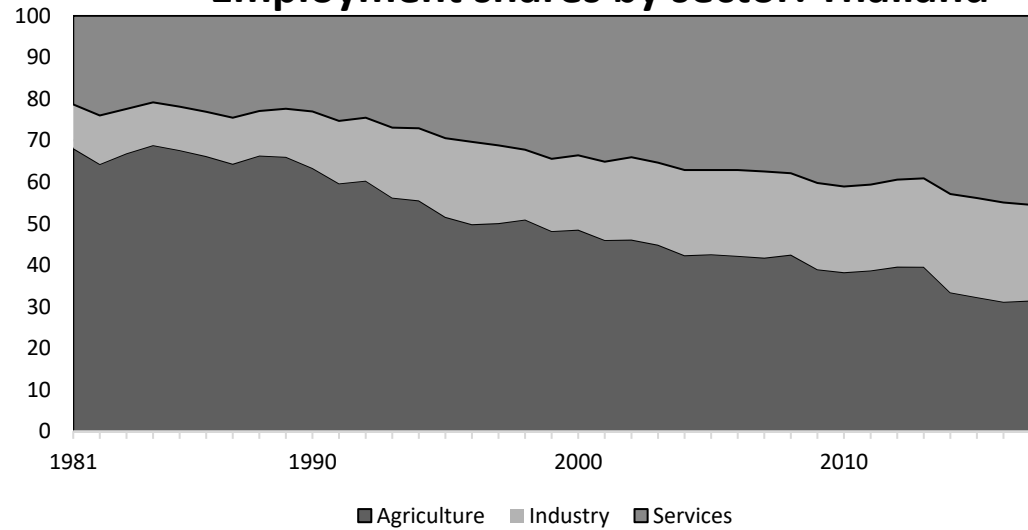
GDP shares by sector: Thailand



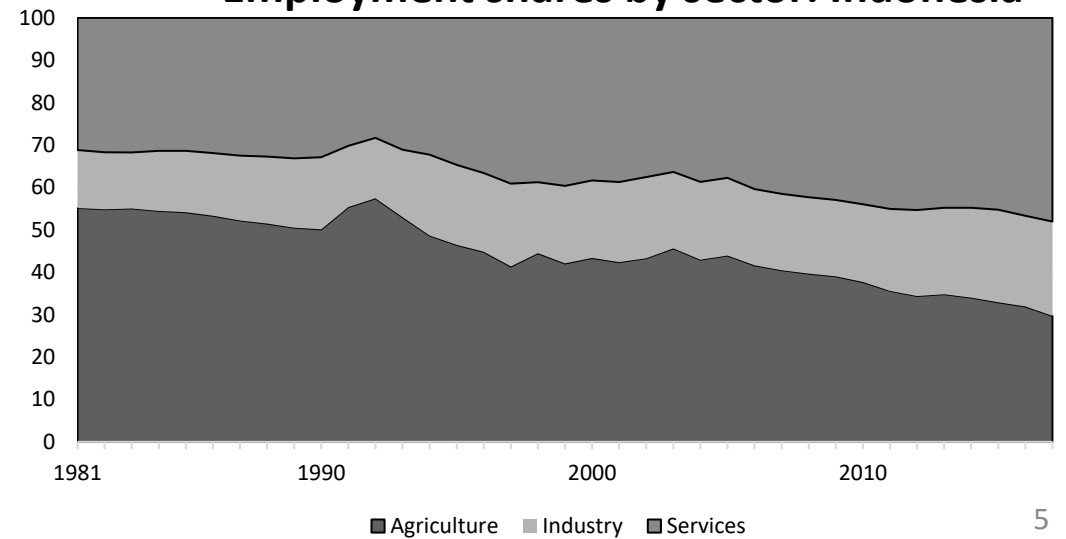
GDP shares by sector: Indonesia



Employment shares by sector: Thailand



Employment shares by sector: Indonesia



We need to distinguish three sources of growth of output per person:

- (a) growth of factor inputs (labor, physical and human capital) relative to population – Krugman's *perspiration*;
- (b) growth of the productivity of these factors, through technical change – Krugman's *inspiration*; and
- (c) growth of aggregate output per worker due to the *reallocation* of labour from lower-productivity sectors (mainly agriculture) to higher-productivity sectors (mainly industry and some services)

Krugman forgot about (c).

Contribution of structural change to aggregate productivity growth

	Mean annual growth of real GDP per worker [1]	Mean annual growth of GDP-share weighted sectoral real value added per worker			Contribution to productivity growth	
		Agriculture [2]	Industry [3]	Services [4]	Within sectors	Between sectors
					[5] = [2] + [3] + [4]	[6] = [1] - [5]
<i>Thailand</i>						
1981–2017: % per year	3.55	0.22	0.64	1.02	1.89	1.66
(1981–2017: % contribution)	(100)	(6)	(18)	(29)	(53)	(47)
<i>Indonesia</i>						
1981–2017: % per year	2.59	0.41	0.58	0.89	1.88	0.72
(1981–2017: % contribution)	(100)	(16)	(22)	(34)	(72)	(28)

Salamat po

Thanks for listening

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