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## **Industrial policy in response to the middle-income trap and the Third Wave of the digital revolution**

**ABSTRACT:** The “middle-income trap” (MIT) is “real enough” for policy makers in developing countries to take it as a serious threat to prospects for achieving “high” average income. Those prospects are further clouded by the major changes occurring as the digital revolution moves from connecting people to the Internet to connecting the Internet to everything else, across many sectors of human life (the Third Wave). Both sets of forces raise the potential advantages of pro-active industrial policy. Yet mainstream economic thinking – and the consensus of international development organizations like the World Bank -- has long tended to disapprove of it, in the spirit of “The best industrial policy is none at all”. In light of the middle-income trap, the Third Wave, and other conditions in the world economy, this essay discusses some of the big issues in the design of industrial policy, on the theme of how to do it well rather than how to do it less.

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From the mid 19<sup>th</sup> century till the 1990s western economies plus Japan grew faster than non-western economies, making for “divergence, big time” (Pritchett 1997). From the late 1990s till 2008 the majority of developing countries grew faster than the US, appearing to confirm that “globalization works”. Since 2008 the majority of developing countries have grown more slowly than the US. This is generally understood as an aberration, until the benefits of globalization for developing countries reemerge -- provided they adopt yet more free market reforms.

This understanding overlooks evidence of the long-term difficulty facing developing countries in achieving “developed country” economic structure and performance.

For example:

- Less than 10 non-western countries have become developed during the past two centuries – even stretching the categories of non-western, developed, and country to include Hong Kong, Singapore, Russia, and Israel. They are almost all small in population.
- A World Bank study (2013) identifies 101 countries in 1960 as “middle-income”. Of those, only 13 reached “high-income” by 2008.<sup>i</sup>
- A study by IMF researchers (Cherif and Hasanov 2015) defines its income thresholds in terms of percentage of US GDP per capita (\$PPP 2005), in contrast to the World Bank study which uses absolute per capita income thresholds.<sup>ii</sup> Of 167 low- and middle-income economies in 1970, only 9 (5%) reached high income by 2010 (46% of US GDP per capita). Of these, 7 were small European countries, which had already reached upper-middle-income by 1970 (Cyprus, Czech Republic, Greece, Ireland, Malta, Portugal, Slovenia). Only two were non-European: Taiwan and South Korea, which shot from less than 20% of US income in 1970 to more than 65% in 2010. Malaysia, by contrast, was about 20% in 1970 and 26% in 2010. Thailand and Chile had roughly similar performance as Malaysia (Chile doing better over the 2000s thanks to the rise in copper prices).

- Branko Milanovic (2005) classifies countries into four bands of GDP per head. At the top are the “rich countries” of the West plus Japan, down to Greece or Portugal. Next are the “contender” countries (those with the best chance of making it into the ranks of the “rich”), down to two thirds of the income of the bottom rich country. Milanovic traces movement across two time periods, 1960 to 1978, and 1979 to 2000. He finds that less than 15% of the contenders at the start of each period rose to the rich category by the end of the period. *A majority of the contenders in both periods fell into a lower income category by the end of the period.* On the other hand, *very few of the “rich” countries at the start of each period fell into a lower category by the end of the period.*

It is as though the rich countries have been held up by forces analogous to magnetic levitation (or “glass floor”), while many upper-level “developing” countries are held down – relative to the rich countries -- by forces analogous to gravity (or “glass ceiling”).

Brazil is a case in point. Between 1950 and 2010 it spent the first 7 years as a “low-income” country and the next 53 years as a “lower-middle-income” country. Over the 2000s it grew fast, inspiring *The Economist* in 2009 to devote 14 pages to “Latin America’s big success story”. Since 2014 the western media has carried almost daily reports on its implosion. *The Financial Times* ran an editorial in 2015 titled “Brazil’s terrible fall from economic grace” (14 September). It said, “The economy is in a mess. Brazil’s worst recession since the Great Depression will see the economy shrink by as much as 3 per cent this year, and 2 per cent in 2016. Public finances are in disarray ...”.

*The middle-income trap (MIT)*

Indermit Gill and Homi Kharas, in *An East Asian Renaissance: Ideas for Economic Growth* (2007), coined the idea of the middle-income trap. They mention it on only two pages in an almost 350 page book, saying little more than,

“In the absence of economies of scale, East Asian middle-income countries would face an uphill struggle to maintain their historically impressive growth. Strategies based on factor accumulation are likely to deliver steadily worse results, which is a natural occurrence as the marginal productivity of capital declines. Latin America and the Middle East are examples of middle-income regions that, for decades, have been unable to escape this trap” (18).

Figure 1 shows income levels in East and Southeast Asia and Latin America from 1960 to 2010 (Ergin 2015). We see the early take-off of Japan, and later take-off of Hong Kong and South Korea (Taiwan, not shown, was ahead of Korea). Then, a long time later and a long way down, come the Southeast Asian and Latin American countries, clustered together. It makes sense to say that these Southeast Asian and Latin American countries have been caught in a middle-income trap.

The basic idea of the middle-income trap can be represented with a 3 x 3 matrix. The start year (eg 1960) is on the horizontal axis, the final year (eg 2008) is on the vertical axis. Each axis is divided into high, middle and low income. The idea of the trap is that most economies in the middle-income band at the start will still be in the middle-income band at the end; very few will have risen to high income.

Felipe et al. (2012), from the Asian Development Bank, calculate time spent in the middle-income range, or more specifically, the lower-middle-income range, for a

large set of economies. They define lower-middle-income, following the World Bank at the time of their study, as a per capita GDP of between PPP\$ 2,000 and \$7,250 a year (about \$5.50 to \$20 a day, in 1990 purchasing power parity [PPP] dollars).

They find that between 1950 and 2010 Japan, Taiwan, South Korea, and China zoomed through the lower-middle-income range in less than 2 decades en route to the upper-middle-income range, and then, for the first three, the high-income range.

Many Latin American and Caribbean countries spent over 4 decades between 1950 and 2010 in the lower-middle-income range and remained in that category in 2010: the list includes Brazil, Bolivia, Colombia, Ecuador, El Salvador, Guatemala, Jamaica, Panama, and Peru.

Indeed, just about all Latin American countries and Middle East countries had reached the lower-middle-income threshold by the 1960s or 1970s, and most remain in or just above this range today.

The Southeast Asian countries come in between. Malaysia and Thailand spent almost 3 decades in the lower-middle range before rising to upper-middle (where they remained as of 2010, when the data set ends). Philippines spent more than 3 decades before rising to upper-middle. Indonesia remains in the lower-middle range, 25 years after rising above the low-income threshold.

More evidence for the MIT comes from a study by IMF researchers (Aiyar et al., 2013). They examine the frequency of “growth slowdowns” for a large set of countries divided into low, middle and high income – using 15 plausible absolute income thresholds for the “middle-income” range; and define growth slowdowns by

a complex formula based on extended deviation downwards from the extrapolated growth path at the earlier faster rate.

The result is clear: middle income countries have more frequent growth slowdowns than low or high income countries. The correlation between *middle-income level* and future growth rates is lower than for low-income and high-income countries. See figure 2. Robertson and Ye (2013) confirm Aiyar et al's conclusions using a somewhat different measure of middle income.

Lant Pritchett and Lawrence Summers (2014) qualify the argument. They find that the correlation between country *income level* and subsequent growth slowdowns is lower than that between *fast pace of growth* and subsequent sharp slowdowns, at whatever income level.

The dominant tendency in growth patterns, they say, is regression to the global mean. Specifically, episodes of “super-fast” growth ( 6% per year or more) lasting more than 15 years are uncommon. China set the world record by 2010 (end of data), when it had experienced super-fast growth for each of the previous 33 years. The only countries which come close are Taiwan, 32 years (1962 – 94) and South Korea, 29 years (1962 – 91).

Pritchett and Summers use these results to challenge “Asiaphoria”, the presumption that the center of gravity of the world economy is shifting rapidly to China and India, based on extrapolating China and India's recent fast growth far ahead. An example is the OECD report *Looking to 2060: Long-term Global Growth Prospects* (2012), which forecasts per capita growth from 2011 to 2020 at 6.6% for China and 6.7% for India.

Such forecasts overlook the dominant statistical pattern, regression to the global mean. They implicitly

assume that countries' own past growth has a weight of 1 and the global mean a weight of 0; whereas the evidence suggests that the weights should be more like 0.2 for past growth and 0.8 for global mean growth. That China had already set the world record for duration of super-fast growth by 2010 makes its sharp slowdown after 2012 unsurprising.

Both Aiyer et al. 2013 and Pritchett and Summers 2014 may be right: sharp growth slowdowns and extended low growth in the broad middle-income range may be caused – in the proximate sense – by a combination of *middle-income level* and *sustained fast growth* followed by regression to the global mean.

We can conclude that the middle-income trap is not well supported empirically if taken to mean *a specific average income threshold* (eg \$10,000) at which a country will -- with high probability -- experience a sharp growth deceleration followed by prolonged semi-stagnation (Im and Rosenblatt 2013).

But if we use the idea in a looser, more metaphorical sense to mean that countries in a broad middle-income band have a higher probability than low- or high-income countries that a period of fast growth will be followed by a sharp slow-down and sustained lower-than-average growth for a decade or so, it is “real enough” to be taken seriously by national policy makers and international development organizations.

Still, income alone (whether level or speed of growth) is not determining. We noted the variation between *regions*. *Timing and geopolitics* also matter. Taiwan and South Korea emerged early after the Second World War, thanks to relatively high productive investment during several pre-war decades of Japanese colonial rule, and high levels of post-war US aid induced by their location



next to the communist bloc. They had few competitors compared to countries which started later when the world was more globalized, which faced fierce competition in labour-intensive and capital-intensive manufacturing. Israel – which might be included in the list of non-western success stories -- developed on the back of enormous wealth and technology injected through the US Defence Department, the Jewish diaspora, and preferential trade agreements with Britain and the Commonwealth.

China is probably going to escape upwards, following its neighbours Japan, Taiwan and South Korea. But China's average income is still very low. Depending on how calculated, it is between 10% and 20% of US average income, and so at most in the lower reaches of the lower-middle-income band according to the criteria of the Cherif and Hasanov study cited earlier. China has a long road to climb before it comes close to the high income threshold.

### *Mechanisms of the MIT*

How to escape the MIT depends on why most countries are caught. The literature suggests several mechanisms. One strand says the causes are too little investment in education and too little “good governance”; so the escape route is more investment in education and more reform of governance. To which one can give a clear maybe. Raising the share of the population with secondary and tertiary education may reduce the chances of experiencing growth slowdowns; but the causality is difficult to establish, and the causality of something as broad as governance reforms even more so (see Kanchoochat and Intarakumnerd 2014; Besley and Persson 2011).

There are several more plausible mechanisms for the MIT.

### Diminishing returns to inter-sectoral reallocation and factor accumulation

Countries in the low-income range can grow fast on the back of (a) cheap labor, (b) transfer of people and other resources from low-productivity agriculture to higher-productivity manufacturing and (some) services in cities, (c) investment to GDP ratios rising from low to medium, and (d) simple imitation of more sophisticated technology. But as a country's average income continues to rise, these sources of growth yield diminishing returns.

### Export structure

A second mechanism relates to the sophistication and diversification of the production structure, and specifically the export structure. Jesus Felipe and co-authors (2012) compare countries which spent more than the average time in the lower-middle-income range with countries which spent less than the average time before ascending to the upper-middle-income range. They find that the former have a significantly less *sophisticated* and less *diversified* export structure than the latter. With reference to the same comparison at the upper-middle-income level, they test only for the *diversification* of export products, and find that countries which spend more than the average time in the upper-middle range have significantly less diversified exports than those that spend less time there before ascending to high income. In the same vein, Imbs and Wacziarg 2003 find that – contrary to neoclassical orthodoxy about the advantages of specialization in line with comparative advantage -- per capita income is positively correlated with a *more diversified* production structure until a turning point at around \$20,000 in today's dollars, far above the normal range of “middle income”. Above this, income per capita is positively correlated with production specialization.

Jan Fagerberg and co-authors qualify the argument about the importance of diversified export structure (2007). They find, across a large set of countries, that countries which in 1980-82 had a relatively high proportion of their exports from four categories of goods (ICT, pharmaceuticals, instruments, other machinery) enjoyed higher subsequent GDP growth to 2000-02 than countries with less of their exports from these industries –for the reason that these four categories experienced the fastest growth of world trade of products (defined at the 3 digit SITC classification). So countries which *specialized relatively more in these four product categories* had a high level of “demand competitiveness”, in Fagerberg et al’s phrase. This qualifies the idea that export diversification per se is what matters.

### Foreign ownership and glass ceiling

A third mechanism is the difficulty faced by countries whose manufacturing sector is dominated by foreign-owned firms and dependent on technology imports in transitioning to one controlled by local managers and with substantial local technology development. Kenichi Ohno (2009) calls this a “glass ceiling”.

Multinational corporations (MNCs) tend not to act as conduits for technology diffusion to local firms. They generally prefer to use in-house production or imports from their own suppliers, source only simple content from local firms, and repatriate profits. They locate their R&D departments not in foreign locations but close to the marketing departments, generally at headquarters.

When local firms do manage to integrate themselves into “global” manufacturing value chains (which in fact are mostly “regional”) they may find themselves locked into low value-added manufacturing activities – which

take on economic qualities similar to low value-added commodities. Without vigorous state action to counter this lock-in a country's firms may be blocked from upgrading to higher value-added items within given product categories or jump to a different set of manufactured products with higher value-added (UNCTAD 2014; Paus 2014; Kaplinsky 2005).

### Low investment to GDP

Low investment to GDP is both cause and effect of the above mechanisms. Table 1 shows gross capital formation to GDP for a mix of regions and income categories (not middle-income per se), between 1970 and 2014. China, again, stands out for its high ratio, perhaps the highest ever recorded. Well below China comes the rest of East Asia and Pacific region. And well below the latter comes the average for low- and –middle-income countries in the rest of the world, whose ratio has remained remarkably constant over this time period.

### *Brazil*

Figure 3 shows the dramatic fall in the share of manufacturers in Brazil's exports between 2000 and 2014, and the increase in the share of commodities like iron ore, oil seeds, petroleum products and meat. Between 2002 and 2011 commodities rose from 28% of Brazil's total exports to 48%; manufactures fell from 55% to 37%.

Between 2003 (start of the Lula government) and 2012 Brazil's exports to China increased by an astonishing 30 times. As of 2010 China became Brazil's biggest trading partner, displacing the US. In 2010 80% of Brazil's exports to China comprised just three commodities: crude oil, iron ore, and soybeans. At the

same time, 98% of Brazil's imports from China were manufactured goods. Most of the elaborate costumes worn for Brazil's *carnivale* are now made in China.

In the light of the above findings about the tendency of middle-income countries with relatively undiversified and unsophisticated production and export structure to get stuck in the middle-income range, these trends are bad news for Brazil. Without reversing the specialization in commodity exports induced by Chinese demand over the 2000s the economy is likely to remain in the middle-income range for a long time ahead (recall that it spent the last 53 years of the period between 1950 and 2010 in the lower-middle-income range).

### *Southeast Asia*

For Southeast Asia, Shahid Yusuf and Kaoru Nabeshima, in *Tiger Economies Under Threat* (2009), say the following:

“Unlike the original East Asian Tiger economies, the Southeast Asian Tigers [including Malaysia, Thailand, Philippines, Indonesia] have yet to build the indigenous capacity to design, to innovate, and to diversity into new and more profitable areas with good long-run prospects, and very few of their firms have created regional – much less global – brand names.... More disquietening is the sparseness of backward links from MNC operations, which would signify progressive industrial deepening, as has occurred in Korea and Taiwan [China], and as is already under way in China. This lack of backward links means that domestic value-added in manufacturing remains low. Moreover, none of these countries has nurtured large and dynamic producers of tradable services” (10).

With reference to Malaysia they say:

“Malaysian industry appears to be sliding down the technological slope, and incentives for workers to improve their skills are weakening” (26).

This is all the more striking because Malaysia has a large concentration of foreign-owned firms (especially on the island of Penang) producing “high tech” products. But they are “cathedrals in the desert”, not much integrated into the domestic economy.

Recall that Malaysia’s income was about 20% that of the US in 1970 and reached 26% by 2010; and that Taiwan and Korea were less than 20% in 1970 and reached 65% or more by 2010. Yet for the past three decades Malaysia has achieved most of the standard growth recipe as Taiwan and Korea in the 1970s (including export sophistication, years of secondary schooling, infrastructure, macro-stability, trade openness) – but has not experienced their sustained fast growth. It is plausible that the key differences are that Malaysia (and the same applies to many other developing countries, including Thailand and Chile) was much later than Taiwan and Korea in pushing out of natural resource specialization, and during that push has invested little in local technology creation, as seen in low levels of R&D relative to GDP, low levels of patenting, and low share of graduates in engineering, manufacturing and construction. Rather, Malaysia has given priority to attracting FDI (Cherif and Hasanov 2015; but for a qualification see Rock 2007).

*Another MIT mechanism: the debt trap*

We have identified three mechanisms of lock-in to the middle-income range, all related to production: diminishing returns to simple inter-sectoral resource transfer and factor accumulation; lack of diversification and sophistication of exports; and largely foreign-owned manufacturing sector, going with local firms’ passive integration into labor-intensive parts of regional value chains.

Then there is the “foreign debt trap”. From the 1970s till today western international organizations and development economists have urged developing country governments to adopt a strategy of “economic growth with foreign borrowing” (Bresser Pereira et al., 2008, 2014). The rationale is that more foreign borrowing permits a higher rate of domestic investment than less foreign borrowing. Advocates of the foreign borrowing strategy tend to downplay the dangers of the country overborrowing in relation to ability to repay. The overborrowing may result from the foreign loans being used to raise *consumption* rather than investment and generate a “feel good” sentiment in the population at large; or from the foreign borrowing being at variable interest rates and then the US Federal Reserve hikes its interest rates, suddenly multiplying the debt burden for developing country borrowers.

When developing countries fall into a debt trap they become vulnerable to the West’s “Washington Consensus” conditionalities, which generally include abandoning a proactive state role in trade and industry. At the time of the East Asian financial crisis of 1997-99 excited IMF officials asked their World Bank colleagues across 19<sup>th</sup> Street in Washington DC to send them lists of conditionalities they at the World Bank wished to impose on the crisis countries, describing the crisis as a golden opportunity. The combined IMF and World Bank conditionalities on the emergency loans to South Korea, Thailand, and Indonesia went far beyond measures related to getting out of the crisis, into a privatization and market liberalization drive that the organizations and the western states which run them had long wanted. Hence the crisis is known in the region as “the IMF crisis”.<sup>iii</sup> A leading American figure in setting the IMF’s and World Bank’s conditionalities in emergency loans to East and Southeast Asian countries in the debt crisis of 1997-1999 explained in private, “If we can’t get them

when they're down, we'll never get them" (personal conversation, 2000).

In short, many but not all middle income countries have rates of long-run growth too low to bring them into the high income category within four or five decades of exiting the low income category. Countries in this "trap" experience a pattern of volatile growth, which itself reflects (1) relatively low "production capabilities" (hence the idea of a "middle capabilities trap": Paus 2014), as seen in relatively undiversified and unsophisticated export product composition; and (2) relatively frequent and/or severe foreign debt crises followed by slow growth.

*Escaping the MIT by upgrading production structure and production-related services*

We can agree that raising the ability of a relatively poor national economy to create income and wealth requires transformation of production structure (coupled with managed rather than free integration into international financial markets). The question is how to transform the production and export structure in the direction of more sophisticated and more diversified products (including services), and not just in an enclave of foreign-owned firms, as in Malaysia's Penang.

This brings us to the contentious subject of industrial policy (IP). The mainstream (since the ascendance of neoclassical economics in the 1980s) has said that selective industrial policy is either ineffective or net harmful. This reflects the unification of neoclassical economics around antagonism to the planned economy, managed trade and an extensive welfare state. A small band of dissidents has argued for the potential benefits of selective industrial policy (Wade 2015).



Being difficult to resolve theoretically or empirically, the debate goes round and round. The theory is ambiguous, partly because the concepts (such as market failure, costs and benefits of “correcting” market failure) are so elastic. Advocates of different prior positions on the role of the state can draw the boundaries of costs and benefits where they wish.

Empirical studies are limited by the difficulty of establishing causality in the absence of an exogenous source of variation. They rely on correlations between, for example, the economic rise of western states and Japan and the role of governments in *creating and shaping* markets (not just fixing market failures), using selective protection, subsidies, standards and patenting to support business ventures (Wade 2014); and between the post-Second World War rise of South Korea, Taiwan, Singapore and a few other cases and a broadly similarly active role of the state (Wade 1990b). But in the absence of an exogenous source of variation (as with randomized control trials) these correlations are always open to alternative causal mechanisms.

This may help explain why hardly any “top” economists work on industrial policy, and why hardly any “top” economics journals publish papers on industrial policy. Yet policy-makers are increasingly wanting advice on industrial policy (even if they do not use that phrase), especially after 2008.

Below I review some of the main debates about IP, including both “why IP?”, and “how to do it well”. But first I should flag up two major issues that have received little attention. The first is the conditions which make for innovative enterprises -- ones which produce higher quality or lower cost products than previously produced in the national territory. The IP debate has tended to be state-centric and overlook the point that the agenda for

IP has to be formulated in relation to the dynamics of innovative enterprise. It is their combination which carries the promise of fast economic development (Lazonick 2008, Sutton 2012, Mazzucato 2013).

The second issue is that major economic sectors are in the early stages of upheaval, as the digital revolution rolls out beyond connecting people to the Internet (underway since the 1980s) to connecting the Internet into Everything. Steve Case (2016) calls this the Third Wave. The industries at the heart of the Third Wave, including energy, transport, education and healthcare, are necessarily heavily regulated (as Second Wave innovations like Google and Facebook are not). The extent to which the innovations take hold in each country depends heavily on the response of governments. IP has to be framed in a way that encourages firms across middle-income countries to adopt Third Wave innovations, and indeed to make them. The alternative is more time stuck in the middle-income range.

The links between IP, innovative enterprise, and the Third Wave have received little attention in the literature. Having flagged them here, I go over more familiar subjects of debate.

### Fixing market failure, or more?

The mainstream “market failure” approach to industrial policy rests on a distinction between sectoral (or vertical) targeting and functional (or horizontal) targeting of interventions. Functional refers to functions which may be undertaken across the board, not limited to particular sectors, and functional policy refers to policies such as R&D subsidies, or special access to credit for small and medium enterprises.

The mainstream considers functional policy more acceptable than sectoral policy. But the distinction is largely meaningless. Almost all state policies beyond basic education and health impact some sectors more than others. Their different impacts should be planned for.

The mainstream posits a trade-off between the inefficiency costs of leaving market failures unattended versus the inefficiency costs caused by government intervention to correct market failures. The policy conclusion is that state “intervention” can be justified in sectors or functions where (1) the market fails (the necessary condition), and (2) the costs caused by the intervention are less than the costs of leaving the market failure unattended (the sufficient condition). Beyond fixing market failure, policy intervention is unjustified except in unusual circumstances. The practical question is how to identify and measure the costs of “market failure” and “government failure”.

Mainstream economists tend to presume that the above two conditions greatly restrict the legitimate scope for government intervention. But others emphasise the pervasiveness of information and coordination externalities as causes of market failure. Externalities mean effects external to the decisions of uncoordinated private profit-seeking actors, which those actors do not have to take account of.

Information externalities mean that a private entrepreneur has limited incentives to invest in experimenting and innovating, because if the project succeeds others can imitate without paying the experiment costs, while if the project fails the entrepreneur bears the costs. Information externalities mean that desirable experimentation, self-discovery and R&D investment by entrepreneurs will be socially sub-optimal. “Socialized

benefits and privatized costs” does not successful capitalism make.

Coordination externalities imply that investment is hampered if upstream and downstream investments are not made more or less simultaneously – especially when economies of scale are large, such that costs of production per unit fall steeply as output rises.

These external effects can justify a proactive role of the state in bearing (“socializing”) some of the risk. Commonly, though, the state fails to design the contract so that it gets a financial return on its “interventions” when these help to generate private sector profit, as does a venture capitalist. Commonly, the state bears the costs and the private sector reaps the financial gain, leading to underfunding of public R&D (Lazonick 2008, Mazzucato 2013). “Socialized costs and privatized benefits” undermines capitalism as much as the opposite.

### Industrial policy within or also beyond existing comparative advantage?

Neoclassical economists tend to take the theory of comparative advantage and the policy of free trade as articles of faith. Paul Krugman remarks, “If there were an Economist’s Creed, it would surely contain the affirmations ‘I understand the Principle of Comparative Advantage’ and ‘I advocate Free Trade’” (1987: 131).

The key justification for free trade (and in effect little or no industrial policy) is that it results in the efficient allocation of resources and therefore in maximum material welfare benefits from those resources – and is mutually beneficial to all economies which practice it. Anything less than free trade implies sacrificing the social welfare for the profit of special interests.

The justification for free trade policy rests on the theory of comparative advantage. Yet the theory, to achieve its logical coherence, contradicts the conditions it is meant to apply to. It assumes, as a *necessary* condition, perfect competition in all markets in all the relevant countries. If there is not perfect competition in some markets in some countries the theory gives no solution. Also, the theory assumes a raft of “no’s”: no externalities; no increasing returns; no factor mobility between countries; and no technical change.

Rather than frame the choice as “free trade versus managed (therefore inefficient) trade” we should frame it as “state following the market or state leading the market”. “Following” means that the state places bets to support *selected* investments which private profit-seeking actors would want to do anyway, helping them to go further and faster than otherwise (Wade 1990a). It means the state promoting some activities ahead of others, but within the limits of the economy’s existing comparative advantage. “Leading” the market means the state pushing resources into activities that the private sector would not undertake without sizable state assistance. In any sector periods of followership and leadership may alternate.

Exhibit A of leading the market is South Korea’s POSCO (formerly Pohang Iron and Steel Company), initiated in 1968 as a largely state-owned enterprise, against the emphatic advice of the World Bank and the US government, which said that steel was not in Korea’s comparative advantage (radios were). After receiving intensive state protection in the first decade it became the fifth biggest steel company in the world by the late 1980s and part of the foundation of Korea’s fast transition to a fully developed economy.

Justin Yifu Lin, chief economist of the World Bank from 2008 to 2012, advocates a “following the market” industrial policy (though he does not use that term). Selected sectors should receive some protection and investment support, but only products and technologies within the economy’s *existing* comparative advantage (perhaps with a few exceptions, like China’s entry into the satellite industry). Over time, he says, the growth of these targeted activities will endogenously change the economy’s endowment structure and hence its comparative advantage.

“The best way for a developing country to achieve sustained, dynamic growth is to *follow comparative advantage* in its industrial development and to tap into the potential of advantages of backwardness in industrial upgrading” (2012: 397, emphasis added).

Notice that the justification is not to do with politics – the (alleged) inability of most developing country governments to “lead” the market effectively. It is that limiting industrial policy to promotion of activities within the economy’s existing comparative advantage is the *best* path, even for high-capacity governments.

This is strange, for both empirical and theoretical reasons. Empirically, there is plausible (though always contestable) evidence that the now developed countries effectively adopted promotion measures during their industrialization which “stretched” comparative advantage rather than stay within its limits, however defined. There is plausible evidence that the most successful developing countries in the post-Second World War period – including Japan, Taiwan, South Korea, Singapore and Israel – also invested far beyond their comparative advantage at any one point in time (Wade, 1990b, 1992).

The standard reply of neoclassical development economists (and modestly heterodox ones like Lin) is: “

but they stayed within their *dynamic* comparative advantage”. Lin suggests that one can identify products and technologies within a country’s dynamic comparative advantage by looking at the export composition of countries with per capita income twice as high (Lin and Chang 2009). But where the twice comes from is unclear. The standard reply easily becomes tautology.

The extent to which the now developed countries and the unusually successful post-war developing countries listed above complied with criteria of comparative advantage has been debated between Lin and Ha-Joon Chang (2009). My conclusion is that the evidence favors Chang: it can justify a state in promoting activities that lead the market, or “stretch” (like a rubber membrane) existing comparative advantage even beyond Lin’s criterion. I leave the issue here (Wade 2011).

### Policy instruments?

Another focus of debate concerns policy instruments. “Price” instruments like tariffs and selective subsidies are relatively easy to implement; but they are constrained by WTO rules. However, the fact that WTO rules “prohibit” certain instruments does not mean that a government which uses them will be punished. Governments which consider national interest to have been damaged by the actions of another government have to bring a case to the WTO’s Dispute Settlement Mechanism. This is typically a cumbersome and costly process, and it is by no means automatic that a government which uses a “prohibited”, let alone “actionable” instrument will be penalized (Aggarwal and Evenett 2010; Wade 2003).

The other big point is that plenty of scope remains within or on the edge of WTO rules for non-price instruments. These include:

- Coordination of investments via (1) entry regulation, (2) investment cartels, (3) negotiated capacity cuts.
- Policies to achieve economies of scale, such as (1) production licensing conditional on production scale, (2) state-mediated mergers and acquisitions.
- Regulation of technology imports, such as screening for import of obsolete technology.
- Regulation of FDI, via (1) ownership restrictions, (2) local content requirements, (3) technology transfer requirements, (4) mandatory worker training.
- Export promotion, via (1) subsidies, (2) loan guarantees, (3) marketing support, (4) national campaigns to persuade producers it is their “national duty” to export, supplemented with prestigious export prizes.
- Government allocation of foreign exchange, prioritizing imports of capital goods and discouraging imports of luxury consumer goods (Kanchoochat and Intarakumnerd 2014).

Another key instrument in the capitalist East Asian cases was publicly funded R&D, aimed (in the early decades) at domesticating and disseminating foreign technologies in priority sectors. The governments did not rely on western or Japanese MNCs to transfer and diffuse new technologies. For example, the Taiwan government established the Industrial Research and Training Institute (ITRI), with a staff of some 10,000 by the early 1980s. One of its institutes was the Electronics and Service Organization (ERSO), with a staff of around



700. ITRI was matched on the military technology side by a parallel organization, which had around 20,000 staff by the early 1980s – and whose R&D spilled over into civilian uses. Taiwan at that time had a population of around 19 mn, and GDP per head about 40% that of the United States (Wade 1990b). The government actively cultivated networks between researchers at home and Taiwanese working overseas, notably a “technical community” linking home researchers with Silicon Valley.

Whatever the instruments, the general principles for the design of incentive systems suggest – and capitalist East Asian experience confirms – that targeted assistance must be given against performance conditions and built-in monitoring against benchmarks (such as price and quality of competing imports); and with clear exit mechanisms, such as sunset clauses. More specifically:

- Support a relatively small number of sectors at any one time; and target fiscal investment incentives at the production of new products or products on the performance frontier within the country. As more than a few producers become able to meet the standards, adjust the targets upwards.
- Think of promoting exports and replacing imports as complements rather than substitutes, “two wings of the same bird”. Schemes such as duty drawbacks can be used to protect exporters from import protection. See Wade 1991 for a simple account of the nuts and bolts of Taiwan’s duty drawback scheme.
- Use protection not to insulate domestic producers from international competitive pressure but to *buffer* them – for example by limiting protection to a certain period within which protected producers must reach close to the price and quality of imported substitutes (Wade 1993).

We are left with a puzzle: why are developing country governments willing and often enthusiastic to sign on to trade and investment agreements with developed country governments which greatly restrict their policy space – well beyond that allowed by WTO rules (as described above)? Developed country governments claim that they (developing countries) face a trade-off: “your policy space or good access to our markets”. So developing country governments give up policy space – often in return for little improvement in market access. Their choice helps to protect the hierarchical structure of the world economy.

Distinguish between additive and parallel value chains, which require a somewhat different development strategy

Additive value chains are those where a product is processed in a sequence of steps, which cannot be done in parallel. They are found mainly in natural resource sectors, such as cocoa and steel. Parallel value chains, found mainly in manufacturing, entail the production of components then assembled into final products. The components can be made by independent producers operating in different locations. Roughly half of world trade is in parallel value chains, and another quarter in additive value chains.

Additive value chains give more scope (than parallel ones) for industrial policy focused on deepening upstream and downstream links within a national territory – for additional processing of agricultural commodities, or deepening steel production into production of steel-making equipment. Parallel value chains tend – since “production globalization” in the 1990s – to be less promising for deepening in specific sectors, because industrial policy resources put into raising the competitiveness of producing certain components may be

wasted as rival producers in other locations gain competitiveness, and existing producers have to “run to stand still”, producing larger output at lower prices.

In the case of parallel value chains, more policy emphasis should be given to building “capabilities” of several kinds; including assembly capabilities which can be deployed in many sectors, and also service capabilities at the two ends of value chains, in design and marketing. China’s strength is not in making components for the iPhone, but in assembly of iPhones and many other electronic items. The UK car industry’s strength is less in making car parts (60% are imported) and more in assembly and branding (Kaplinsky and Morris 2015).

### *How to establish an effective industrial policy agency*

The argument so far points to the need for one or more agencies tasked with prescribing actions to be taken now in order to improve the economy’s future growth. Cross-country evidence suggests some rules of thumb for how to create and sustain effective agencies, even in a surrounding bureaucratic swamp: “islands of excellence” or “pockets of effectiveness” (Roll 2013).

- The top of government must be committed to the mission of diversifying and upgrading production structure.
- The agency director must be appointed by the top.
- The appointment should by-pass normal, patronage criteria – probably against a lot of elite opposition.
- The director will come from *outside the inner elite*. This makes the director less vulnerable to the “*insider’s dilemma*”. A director from inside the inner elite will be under strong pressure to appoint inside-

elite staff (including adult children of the inner elite), which risks staffing the agency with incompetence and unmotivated people, opening the director to attack for running an ineffective agency. On the other hand, if the director does not staff from the inner elite the agency may be rendered ineffective by attacks from those spurned.

- Initially the director has *weak* political ties to the top political authority; but once appointed must develop *strong* ties to the top, for defence of the agency.
- The director must protect the autonomy of the agency by manipulating connections to politicians, firms, unions. Autonomy is not the same as “separate” and is not fixed in law. *Autonomy is relational*, it has to be constantly fought for.
- To make sensible decisions on “directional thrust” the agency must engage in dense dialogue with the private sector and state-owned enterprises. In this way the agency can protect itself against the always-ready charge that it is “picking winners” (or in the vocabulary above, “leading the market”). In the dense dialogue the distinction between leading and following the market becomes blurred.
- Dense dialogue with the business sector poses the acute question of the integrity of agency staff, which relates to remuneration. The Singapore solution is worth copying. Set senior public service salary grades by explicit comparison with the nearest equivalents in the private sector. For example, set the remuneration of the top civil servant in a certain agency as the average of the remuneration of the top five executives in the nearest private sector jobs, so that as the latter’s remuneration rises, so does the top civil servant’s; and so on down. Combine with severe

sanctions against civil service corruption (Wade 1985).

Of course, the “political settlements” of a society may make this read like a utopian prescription (Khan 2013). Many rulers appoint their friends and relatives to top positions (think Ukraine, Nigeria) so as to shore up their hold on power and stabilize the regime. The result is likely to be ineffective agencies. As noted at the start, sustained economic development is very difficult; it is not generated “by itself” in real-world capitalisms if only government gets out of the way.

### *Conclusions*

Apart from mega China and tiny Taiwan (off China’s coast), no national economy has grown at more than 6 percent a year for 30 years or more. Others have managed 6 percent or more for 10-15 years, only to experience a protracted growth slowdown. Sharp growth slowdowns seem to be more frequent among middle- income countries than either low- or high-income countries. The sheer difficulties of becoming developed are underlined by the small number of non-western countries which have become developed in the past two centuries; less than ten. An even smaller number of “developed countries” in 1960 became “developing” by 2010. There seems to be a “glass ceiling” and “glass floor” in the world economy.

The glass ceiling and floor may have become even stronger in the past two decades, owing to the big forces which developing countries have to take as given as they integrate into the world economy: financialization (with the centers of finance still mostly in the West and the US dollar still the dominant international currency); high market concentration and market power in the hands of western MNCs; insufficient global demand (except when

fueled by unsustainable debt); the digital revolution, with robotics cutting manufacturing and middle-class jobs; and now the upheavals of the Third Wave.

Sectorally targeted industrial policy can help developing countries escape the middle-income trap, and was (probably) effective in East Asia. But it is anything but a silver bullet – more for political rather than narrowly economic reasons. Once industrial diversification and upgrading incentives of various kinds become available, potential beneficiaries have incentives to “fish the government for fools” -- to take the money and run, to press for trade protection and subsidies with no performance conditions or ones easily fudged.

Brazil is again a case in point. Regulations promulgated for the car assembly industry in 2011 included local content requirements fudged in a way that allowed foreign-owned assemblers to include expenses for marketing, public relations and lobbying; and that required a mere 0.5% of gross revenues to be spent on R&D, far less than the industry spends in other countries. Thanks to measures like these, plus substantial trade protection, the car assemblers have enjoyed profit rates of around 10%, three times the common rate in the US market. Similarly in electronics. The Taiwanese-owned company Foxconn has established factories in Brazil and received subsidies amounting to 10-15 % of the retail price, enabling imports to be undercut; yet the (real) value-added in Brazil is small, because most is in imported components.

It is easy to see why industrial policies like the Brazilian ones just described are a mistake; and also why implementing well designed ones can be politically and administratively difficult. But it bears repeating that the neoclassical or Washington Consensus package is unlikely to yield upwards income convergence, because

convergence is often blocked by market, property, and political forces , including those which make the middle-income trap.

Well designed, well implemented industrial policies, particularly targeted at boosting the capabilities of local production and service firms, are an almost necessary -- but not sufficient -- condition for a country to ascend relatively fast through the middle income range, against the “gravitational” forces of the world economy and world politics. (Of course, a country sitting on oil, diamonds, copper, lithium or other natural resources may also ascend quickly for as long as demand holds up.) Once in the high income range, several kinds of “levitation” or “glass floor” forces will tend to keep it there, including trade and investment agreements with poorer economies favourable to itself (Wade 2003, UNCTAD 2014).

In short, developing country policy makers should be doubly cautious about accepting the dictum of German Chancellor Helmut Schmidt, referring to national exercises of foresight, “People who have visions should see a doctor”. They should follow Thomas Edison’s, “Vision without execution is hallucination”. END

- The author thanks Ipek Ergin for helpful discussions about the middle-income trap.

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Figure 1. East Asian, Southeast Asian and Latin American average incomes, 1960 – 2010 ( Ergin, 2015)

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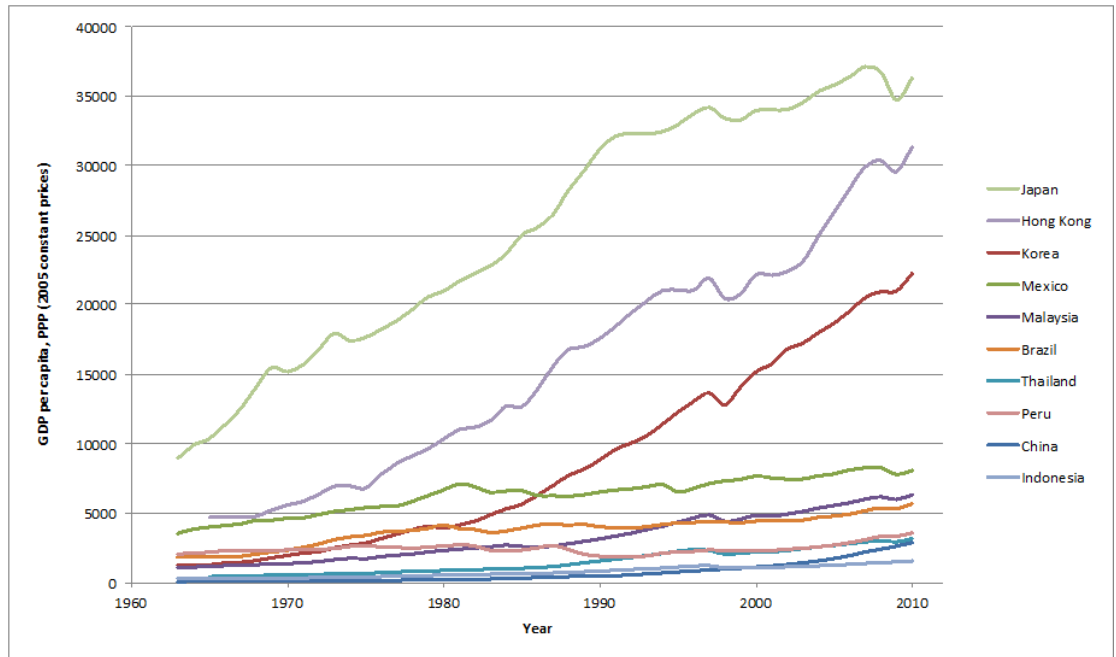


Figure 2. Frequency of growth slowdowns at different middle-income ranges (Aiyer et al 2013)

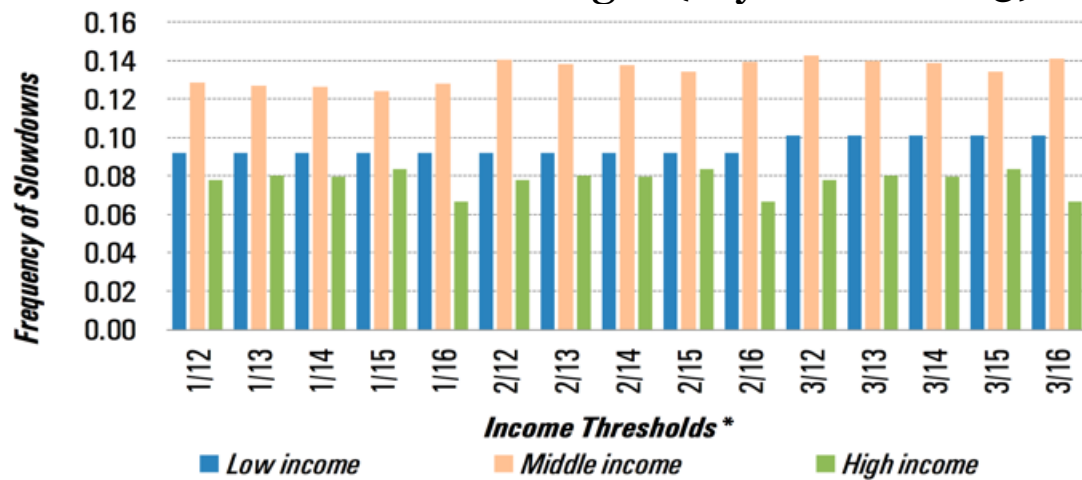


Table 1 Gross capital formation/GDP, selected entities

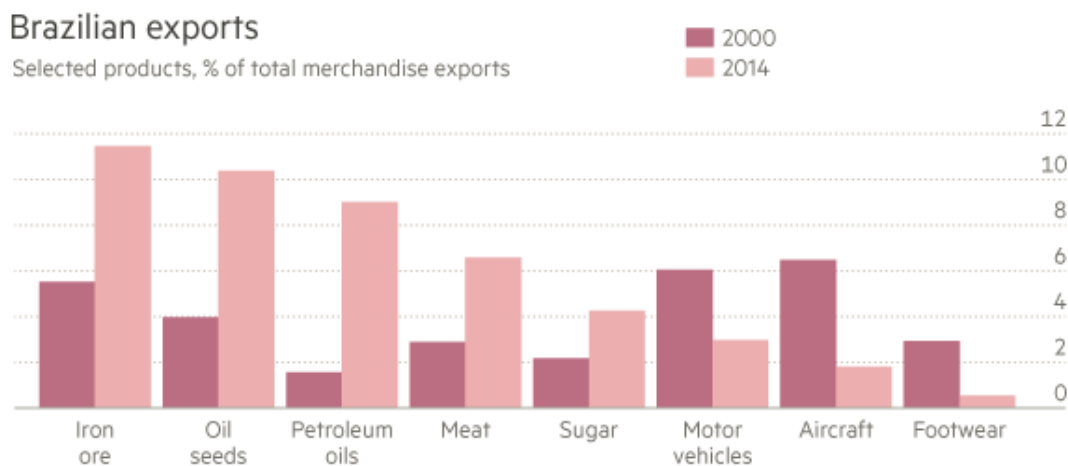
	1970	1990	2012	1980 - 2014
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China	33	36	47	40
East Asia & Pacific minus China	23	32	30	28
LICs & MICs minus East Asia	22	22	25	23

*Source:* World Development Indicators, 12/22/2015

**Figure 3. Brazilian exports, selected products % of total merchandise exports, 2000, 2014**



Source: Unctad

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<sup>i</sup> Different sources at different times use different definitions of income thresholds. The World Bank now uses Gross National Income per capita, calculated using the World Bank Atlas method. As of mid 2015, it defined low-income economies as those with a GNI per capita of \$1,045 or less in 2014; middle-income economies as those with a GNI per capita of more than \$1,045 but less than \$12,736; high-income economies as those with a GNI per capita of \$12,736 or more. It separated lower-middle-income and upper-middle-income economies at \$4,125." <http://data.worldbank.org/news/new-country-classifications-2015>. The 13 economies which rose to high-income include: Equatorial Guinea, Greece, Hong Kong, Ireland, Israel, Japan, Mauritius, Portugal, Puerto Rico, Republic of Korea, Singapore, Spain, Taiwan.

<sup>ii</sup> The IMF study takes the median as the threshold for “upper-middle-income”, which in 2010 translated into \$6,600 and 16% of the US average income. It takes the 75<sup>th</sup> percentile as the threshold of “high income”, which translated into \$19,050 and 46% of the US average.

<sup>iii</sup> For the inside story of the East Asian crisis of 1997-99 see Blustein 2001; also Wade 1998a, 1998b. The Chiang Mai Initiative was established by the ASEAN plus Three countries to provide themselves with a means of by-passing the IMF in future crises. See Wade 2013a, 2013b.