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**SHUDDER: THE CHALLENGES TO “INDUSTRIAL POLICIES” IN THE
EARLY 21ST CENTURY IN LOW AND MIDDLE INCOME ECONOMIES**

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Shudder: The Challenges To “Industrial Policies” In The Early 21st Century In Low And Middle Income Economies

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Abstract

After some years in which industrial policy was frowned upon, it is now widely considered to be a legitimate arena for policy formulation. The danger is that policymakers will seek to return to previously implemented policies. However many elements of this historic policy agenda is not replicable because of changes in global governance regulations. But changing framing conditions in the global economy also mean that the historic agenda is no longer optimal. This Chapter discusses four disruptive structural changes which affect the industrial policy agenda – the changing manufactures-commodities terms of trade, the centrality of global value chains in world industrial production, the growth of environmental externalities which affect growth and development, and the need to develop more inclusive patterns of growth. The key findings are that there is scope for industrial policies to successfully confront these challenges, but that this will be contextual and may require a mix of policies designed to meet multiple objectives. Significantly, industrial policy should be seen as a process aligning the operations of key stakeholders and subject to change as conditions alter, rather than as a an Industrial Policy Roadmap of the sort which frequently characterised policy in the past.

Keywords

Industrial Policy

Terms of Trade

Global Value Chains

Inclusive Innovation

Green Industrial Policy

Replacing the ladder: Industrial Policy is (once again) respectable

There is widespread recognition that to a greater or lesser extent, each of the currently industrialised economies benefitted from policy support in the development of their industrial sectors. This does not mean that all state support contributed to industrial development or to an optimum pace of industrial development, but rather than it has historically proved to be a necessary condition for industrial growth, and particularly for rapid industrial development.

Few contested the importance of industrial policies in the nineteenth century, particularly not in the European and North American economies seeking to replicate Britain's pioneering industrial development. Between the 1920s and the 1970s, state supported "forced industrialisation" in the Soviet Union. After the war, first European economies and then Japan and the "Asian Tigers" (Hong Kong, Korea, Singapore and Taiwan) pursued industrial policies designed to close the gap with the USA. These developments placed industrial policy at the centre of the policy stage and many developing economies sought to learn from this experience. *Dirigiste* industrial policies were increasingly pursued in most of the decolonising economies in Africa and Asia (and particularly in China and India) as well as in Latin America.

Yet, despite the demonstrated importance of policy support in the development of industrial sectors, industrial policy fell out of favour from the early 1980s. In part this was because the import substituting industrial policies in the post-war period were poorly designed, in many cases fostering monopoly, rent-seeking behaviour and inefficiency. But it also reflected the power of transnational capital seeking to open global markets in order to valorise rents on a wider global scale. Together with their governments and with support from the International Financial Institutions, they conspired to "kick away the ladder" which they had used to promote their own industrial development.¹

Two sets of related events have reversed this pessimism over industrial policy. The first has been the demonstrated success of China (and to a lesser extent other middle income economies such as Brazil and India) which experienced very rapid and sustained industrial growth and structural change in a context of very active government support. The second was the growing recognition in the old industrial northern economies that they were falling behind middle income economies growth rates and in many sectors were losing their dominance, including in knowledge intensive goods and services. This has led to a growing call for active policy support in high income economies.

From the developing country perspective, this has provided legitimacy for industrial policies and has opened up considerable policy space – the "ladder" is available for use again. However, it is clear that this new policy environment cannot lead to a re-imposition of the import substitution policies which had previously backed industrial development in both the northern economies in the 18th and 19th centuries and in

¹ "It is a very common clever device that when anyone has attained the summit of greatness, he kicks away the ladder by which he has climbed up, in order to deprive others of the means of climbing up after him" (List, 1885, cited in Chang, 2002:4).

many developing countries between 1950 and the early 1980s. Nor will it be easy for newly industrialising economies to replicate the export oriented success of China and other Asian economies. There are multiple reasons why policy cannot revert to the *status quo ex ante*, and these will be discussed in later sections. But, in addition, there have been important structural changes in the global economy over the past few decades which provide new opportunities and obstacles to industrial development in low and middle income economies.

This chapter focuses on four structural changes which affect industrial policy formation in the early 21st century in low and middle income economies. These are the changing manufactures-commodities terms of trade, the centrality of global value chains in world industrial production, the growth of environmental externalities which affect growth and development, and the need to develop more inclusive patterns of growth. The latter two of these structural factors are not just relevant to industrial growth, but more importantly they affect the social and political structures which make industrial growth sustainable over time.

Shudder: The Structural Changes which Circumscribe Industrial Policy

Changing terms of trade²

For many decades – at least until the 1920s and probably as far back as the early 19th century – the manufactures commodities terms of trade have risen. This was a consequence of the relatively low growth elasticity of demand for commodities and the availability of low cost supplies of commodities. Of course there were exceptions to this but in general this affected all three families of commodities - soft (agricultural commodities), hard (minerals and metals) commodities and energy (oil and gas) commodities.

Between 1950 and 2002 there were two brief periods in which these terms of trade rose in favour of commodities. The first was in the early 1950s, affecting soft and hard commodities. Commodity price rises were a function of increased demand in a period of post-war reconstruction and the expectation (triggered by the Korean War) that prices would continue to rise. However this price surge was brief, and by 1953, declining commodity terms of trade had been resumed. The second interruption in this long term price trend was between 1972 and 1975, predominantly affecting soft and energy commodities. The price surge reflected a sustained period of economic growth in the global economy, climate-induced interruptions to supply (in the Soviet Union, the USA and Asia) and geopolitical interruptions in supply (the Arab-Israel war and the rise of OPEC). But, as in the case of the early 1950s commodities price surge, this boom did not endure, and within three years the historic price trajectory had resumed.

However, after 2001, a third and much longer phase of commodity price boom emerged. With blips (during the financial crisis in 2008 and as global instability re-emerged in 2013), this post 2002 price boom has endured. The question is whether it will be sustained in the future? Here there are strong grounds for believing that the answer is “yes”. On the demand side, unlike the post world war two period in which global demand for commodities was driven by high income economies, the early 21st

² The discussion in this section is drawn from Farooki and Kaplinsky, 2012.

century is likely to see a different motor of growth, that is demand-pull from low and middle income economies. Since the major sectors using most hard commodities and many energy commodities are infrastructure and construction (rather than, as is commonly believed, manufacturing), we are likely to witness substantial investments in these sectors in a number of rapidly growing and heavily populated middle income economies such as Brazil, China, India and Indonesia. As incomes grow, demand for animal based food is likely to expand disproportionately in these and other low and middle income economies.

At the same time, the era of low cost supplies of many commodities has been exhausted. In soft commodities high yielding land has been used up and irrigation requires very substantial investments. Technological change in agriculture has slowed and there are no informed expectations of a new surge of rapid productivity growth. Climate change and (especially) climate chaos threaten to lead to frequent interruptions to supply. In hard commodities, there are potential new sources of supply for many metals and minerals, but these investments have long gestation periods (in a period of financialisation in which long-term investments are discouraged by the market). Moreover, much of this supply is in high-political risk economies with poorly developed infrastructure³. In energy commodities, recent technological developments (gas fracking) do provide the potential for low cost energy in North America (and perhaps in other countries such as the Argentina, Australia, Poland, South Africa and the UK, although this is by no means certain), but there is limited substitutability between oil and gas, and newly exploited deep water deposits produce oil at a high cost. In all three families of commodities, the post 2001 price surge also reflected the loss of self-sufficiency in China (which is the not just the largest global consumer, but also the largest global producer of most commodities), a phenomenon likely to be experienced in India in the coming decade)

For all these reasons, low cost commodities (and of course there are exceptions to this broad general statement) are likely to be a thing of the past.⁴ In itself this does not portend a rise in the commodities terms of trade since this is a ratio of commodities prices to manufactures prices. But the price of manufactures experienced a substantial change in trend after the late 1980s, largely due to the expansion of global value chains (GVCs) and the development of industrial capabilities across the world. There

³ Prior to its public flotation in 2011 the CEO of Glencore (the world's leading commodity-traders) remarked – “Unfortunately, God put the minerals in different parts of the world. We took the nice, simple, easy stuff first from Australia, we took it from the United States, we went to South America and we dug it out of the ground there. Now we have to go to more remote [and unstable] places [in Africa]”.

⁴ This does not mean the end of commodity price volatility, which might include periodic large falls in prices. Amongst other things, the financialisation of commodity markets since the 1990s has meant that long term price trends are often swamped in the short term by excessive price volatility as speculative commodities trading leads to exaggerated price, augmenting price rises in periods of boom and price falls in periods of recession.

are now thus intense price pressures being experienced in most global markets for manufactures.

The upshot of these price movements is that many commodity producers, such as low and middle income economies in Africa and Latin America, will be developing industrial policies in the context of sustained high commodity prices. At the very least, this means that resource producing sectors will continue to flourish in terms of production. But in many cases, where producers have production costs which are below the prices set by high cost marginal producers in tight global markets, this also provides commodity producing countries with significant rents which can be used to promote their industrial development.

The broadening and deepening of global value chains (GVCs)

In 2009, the iPhone 4 sold in the US for just under \$500. It was “manufactured” in China and exported at an fob price of \$179. The value added to each iPhone in China was \$6.50 (Xing and Detert, 2010). The WTO estimated that in 2012, 28% of global trade – that is, \$4tr of \$19tr – was the double counting of intermediate products (such as the flat screens in the iPhone) subsequently incorporated in final products.

These numbers – the specifics in the case of the iPhone, and the general in relation to global trade – witness a significant structural change in the production and exchange of globally traded goods and services over the past four decades. The origins are to be found in the 1970s, a period by which most of the currently high income economies had successfully recovered from the devastating consequences of the war. Per capita incomes were high and growing, and consumers were willing to pay a substantial premium for higher quality, differentiated and frequently changing consumer goods. Production technologies – embodied in machinery and disembodied in forms of organisation – were becoming increasingly complex and knowledge intensive. Many sectors were experiencing heightening competition as post-war scarcity was overcome, and the retail sector was becoming increasingly concentrated. At the same time, capabilities were growing in many low income economies, particularly in north eastern Asia.

In the face of these developments, corporate strategies were in transition, away from the large integrated transnational firm which produced much of the value in its final products, to a specialisation in core competences. These competences reflected areas in which the firm had distinctive capabilities which were hard to copy and which were valuable to customers. Anything outside of these core competences was outsourced often, given improvements in logistics, communications and transport technologies, to suppliers across the globe.

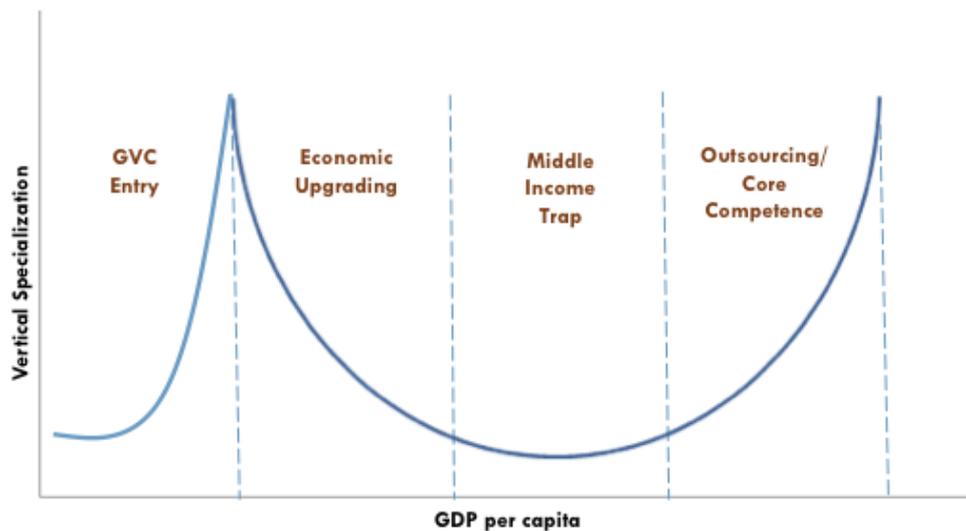
These developments have had profound implications for the comparative advantage of exporting economies, and the competitive advantage of individual firms. In previous decades these producing units were engaged in what might be termed “whole product” production. Now they compete on the basis of increasingly specialised links in the value chain. To illustrate this we can compare two production systems – the Ford River Rouge integrated production plant of the 1920s with the globally produced iPhone in 2009. The Ford plant was widely viewed as the apex of mass production organisation; the iPhone is an exemplar of contemporary production in GVCs

The Ford River Rouge auto plant in the US was constructed between 1917 and 1928. It was “1.5 miles (2.4 km) wide by 1 mile (1.6 km) long, including 93 buildings with nearly 16 million square feet (1.5 km²) of factory floor space. With its own docks in the dredged Rouge River, 100 miles (160 km) of interior railroad track, its own electricity plant, and ore processing, the titanic Rouge was able to turn raw materials into running vehicles within this single complex, a prime example of vertical-integration production. Over 100,000 workers were employed there in the 1930s” (http://en.wikipedia.org/wiki/Ford_River_Rouge_Complex). In 2009 the iPhone which retailed in the US for just under \$500, was assembled in China using flash memories, display modules and touch screens from Japan (combined value of \$49.25), processors and memories from Korea (\$22.96), baseband, camera module, RF transceiver, GPS transmitter and power functions from Germany (\$28.85) and components from many other countries (Xing and Detert, 2010). Each of these components in turn generally comprised sub-components imported from plants in other countries. As observed above, of the final selling price of the iPhone of nearly \$500, the assembly operations in China accounted for \$6.50 of the final price, and more than \$320 accrued to Apple as its margin over production costs.

Millberg models this transition in production paradigm in relation to the degree of “vertical specialization” (that is the slicing of the chain into very finer sub-processes (Figure 1). He argues that as firms enter GVCs, their degree of value added initially falls (as in the iPhone case), but as they consolidate their positions in the chain and upgrade by building their own distinctive competences, they become responsible for deeper levels of value addition. This position then plateaus and they find themselves in a world of growing competition, so that they learn to focus on distinctive core competences and to “lead” the manufacturing processes by outsourcing non core competences to chains which they learn to “govern”.⁵

⁵ For a discussion of chain governance see Gereffi’s seminal article (Gereffi, M. Korzeniewicz and R. Korzeniewicz 1994; Kaplinsky and Morris (2001) and Gereffi, Humphrey and Sturgeon (2005).

Figure 1. Competitive advantage and corporate strategy in the context of dynamic global value chains.



Source: Millberg, personal communication

The first lesson to be learned from this for industrial policy is that the critical component of success is the command of capabilities rather than the ability to produce “whole products”. The second and related lesson is that in the context of intense global competition, these need to be *dynamic* capabilities, subject to continuous processes of upgrading. The value chain literature has produced a distinctive take on upgrading, showing that it transcends the classic categories of traditional industrial policy (process and product upgrading) by identifying functional upgrading (changing the function in the value chain) and chain upgrading (moving to different chains or different market channels in existing chains) (Kaplinsky and Morris, 2001). More recently, et al and van Tulder have argued that the long term development of capabilities may require in some instances that in the short term firms move into less complex and less knowledge-intensive activities in the chain and subsequently develop the capabilities to deepen the knowledge-intensity of their roles (Barrientos, Gereffi and Rossi, 2011, van Tulder, 2013). These developments mark major changes in the character of competitive advantage and this, as we will argue below, has implications for industrial policy.

Environmental externalities, growth and development

For much of humankind’s existence, the environment has been seen as exogenous to the economy. It was viewed as “god-given” or a “gift of nature”, a free resource open to exploitation (depending on belief systems). As recently as two centuries ago, David Ricardo built a theory of rent to explain differential incomes arising as a consequence of access to land of varying natural endowments. Gradually, the theory of rent has come to a rather different perspective, one in which the resource-pool is seen not just as arising out of natural endowments, but also as being affected by the application of capital and knowledge. Land can be improved by investments in irrigation, agricultural productivity can be enhanced by the introduction of new seeds, and mines

can be made more productive by the use of technologies which allow thinner seams to be commercially exploited.

The application of science and technology to the exploitation of resources has changed the nature-humankind interaction from an exogenous (human activity drawing on nature) to an endogenous (human activity can change the gifts of nature) agenda. For much of the period of modern industrial development, this has been seen as a positive development, with industrial activity enhancing the ability of humankind to exploit the natural environment.⁶ Yet at the same time, it has also been clear that the endogenisation of the environment into human economic activity has had its darker side. Since many negative environmental spillovers involve externalities, the market provides poor signals for the husbandry of the natural world. The consequence is that we have been witnessing a range of environmental degradations which not only undermine the quality of human life, but are beginning to eat into the efficiency of the industrial sector itself, and to spill over into the efficiency of other economic sectors such as agriculture, services and tourism (which in turn feed back into the efficiency of the industrial sector since these sectors provide inputs for industry and use its outputs).

These developments in humankind's interaction with the environment have three important implications for industrial policy. First, a concern with the environment needs to be built into the industrial sector in order to reduce its costs of production. For example, there are important developmental concerns why green technologies should be promoted as a mechanism for promoting the efficiency of industry (UNIDO, 2012). The International Energy Agency calculated that between 1980 and 2003, the energy efficiency of global output increased by 23%, saving the equivalent of 5.5 gigatonnes of oil equivalent (cited in UNIDO 2012). Similarly, water and waste treatment investments can promote cost reduction, particularly in the medium and long term. Second, the growing commitment to greening the economy provides substantial economic opportunities to provide technologies to meet these objectives. The UK's Confederation of British Industry estimated the value of the green economy to be £122bn, growing at 4.7% in 2011 and contributing eight percent to the UK's GDP.⁷ Finally, the rapid and geographically uneven degradation of the environment has important social and political implications, and these may have an impact on the sustainability of industrial development. For example, the forthcoming shortage of water in many countries (www.unwater.org) is likely to be associated with social and political unrest, undermining the environment in which industrial growth can be pursued.

Industrialisation and inclusive growth

The past two decades have witnessed a significant change in global patterns of growth. Between the industrial revolution and the early 1970s, the high income northern economies countries grew much more rapidly than their low income southern counterparts. After the 1970s, there was a rapid process of catchup in Hong

⁶ In the US in the 19th century, not only was industrialisation built on the back of the resource sector, but the capabilities built in the industrial sector fed back into improved efficiency in the resource sector Wright and Czelusta, 2004).

⁷ "Choice between 'green or growth' is a false one, CBI chief says", The Guardian, 5th July 2012.

Kong, Korea, Taiwan and Singapore, and after 1990 in China, India and their neighbouring economies. Since the turn of the millennium there has been rapid growth in many Latin American and African economies. For example, six out of the ten most rapidly growing global economies since 2000 have been in Africa.

However, this does not mean that there has been equivalent progress in global poverty reduction. Table 1 tells a compelling story. The first decade of the twenty-first century witnessed an acceleration of growth in many low and middle income countries. These rates were high by comparison with the last decade of the twentieth century (and even more so in comparison to the lost development decades of the 1980s), and by comparison with global average growth rates in the same periods. Rapid and accelerating growth was most pronounced in China and India. But was also evidenced in middle income countries as a whole, as well as in sub-Saharan Africa (SSA) which experienced a particularly rapid rate of growth after 2000. At the same time, the numbers living globally below the \$1.25pd Millennium Development Goal benchmark (hereafter referred to as MDG1) fell by 165m between 1998-1999 and a further 454m between 1999 and 2008. This is often taken to indicate progress in global poverty reduction. However there was a very pronounced bias to this performance. The decline in the poverty number in China over the whole period (510m) comprised the bulk of the global total (619m). In India, the absolute numbers grew in the 1990s and fell marginally in the 2000s. In Africa, despite very impressive growth, the number living below \$1pd rose in both periods.⁸ Strikingly, despite rapid economic growth, there was a more than doubling of the number of the absolutely poor in middle income countries and currently, more than 70% of those living below MDG1 live in this rapidly growing group of economies (Sumner, 2010).

Three conclusions emerge from these data. First, there is no doubt that growth contributes to a reduction in absolute poverty. The fact that global population grew over the 2008-1990 period makes this growth contribution more impressive than the data in Table 1 suggest. But, second, current trajectories of growth continue to leave behind a large number of the global poor who continue to live in absolute poverty. The performance of SSA and India is particularly striking in this regard. Third, given that most of the global poor live in rapidly growing middle income economies, the MDG agenda cannot be confined to least developed economies.

⁸ SSA's growth rate accelerated after 2002 rather than 2000. This had a marginal impact on the numbers in Table 1, with a fall in the MDG1 number by 4m rather than an increase of 13m between 2008 and 2000.

Table 1. Annual growth rates and numbers living below \$1pd, 1990-2008, 1990-1999 and 2000-2008

	Change in numbers (\$1pd) (m)			Annual growth rates (%)	
	1990-1999	1999-2008	1990-2008	1990-1999	2000-2008
World	-165	-454	-619	2.8	4
China	-237	-273	-510	10.7	11
India	-35	24	-11	5.8	7.4
SSA	87	9	96	2.2	5.8

Source: Poverty numbers from Chen and Ravallion (2008) and Sumner (2010). Growth rates from WDI, accessed October 2011

What these numbers point to is the structural character of the dominant growth model in which, in many countries, a significant proportion of the population is being excluded from the fruits of growth. Thus the normative challenge which the industrial sector has to confront is how it can contribute to a more inclusive pattern of growth. But at the same time, as in the case of environmental externalities, the failure to build more inclusive patterns of development can undermine the capacity of the industrial sector to grow on a sustainable basis. The political turmoil in the Middle East and North Africa economies since 2009 is at least in part a consequence of the inability of these economies to develop more inclusive patterns of development. The ensuing and prolonged conflicts have major disruptive effects on industrial production and growth. Of course, the problems of social exclusion arise for multiple reasons, and many of the solutions lie outside of the industrial sector. But at the same time the industrial sectors' trajectories have been a contributory factor, notably because of the capital intensity of much of production and the failure of industry to produce products which are affordable and relevant to the needs of the poor and the excluded.

Shudder: Inherited Industrial Policies Hit a Wall

After a hiatus of more than two decades, industrial policy is now once again widely recognised as being an important component of industrial growth. From the perspective of low and middle income economies, there is however a danger of reinventing the past. The task is to avoid the example of repeated military policies in which heavy investments have been made in technologies which have been designed to win the wars of the past rather than those of the future.

Whilst there has naturally been a wide variety of industrial policies over the centuries and decades, a number of core elements stand out from historical experience. First, trade policies have played an important role. Import substituting industrialisation was built around protecting domestic industry from competition, and more recently, export oriented industrial policies have depended heavily on subsidies and specific regulatory regimes in Export Processing Zones (EPZs). These provided exporters with exemptions from taxation and controls affecting producers for the domestic

economy.⁹ A second weapon in the policy armoury was industrial licensing, targeting specific industries (and sometimes firms) for development and limiting the scale and scope of industrial investments in these and other sectors (and by non-favoured firms). Third, incentives were introduced to favour local suppliers, including through purchases by the state. Fourth, and related, many industrial policies targeted particular patterns of ownership. In some cases, this was biased in favour of foreign-owned firms, but more often these policies were designed to promote local ownership (for example ethnicity, as in Malaysia and South Africa, or size, as in India). The promotion of state owned enterprises (SOEs) was in many cases an important element in the policy agenda. Fifth, the intellectual property rights regime provided scope to promote local firms and local innovative capabilities. And, finally, the recognition that market failures are endemic led to active policies in cross-sectoral sectors and activities, for example in skills formation, innovation policies, the promotion of research and technology organisations and infrastructural development.

Whilst some of this policy agenda will still be legitimate and appropriate to industrial policy in the 21st century (for example, meeting market failures), other elements of this policy agenda are no longer admissible for economies participating in the WTO and other international agreements. These severely limit trade policy interventions, particularly those involving protection. They also limit local procurement and the intellectual property rights regime and many other policies designed to foster local and state ownership and local innovative capabilities. There are of course ways around these limits. For example, rather than China formally prescribing the presence of global mobile phone producers, it intervened in favour of local firms by changing the standards governing cellular networks, thereby undermining key elements of competitive strength of foreign firms such as Nokia. Similarly, some large developing countries such as India have been able to tweak intellectual property rights regimes to foster the development of local industry and to meet developmental objectives, But nevertheless, despite these exceptions, as a general rule there is much less freedom to draw on this inherited policy armoury than in previous decades, particularly for smaller and weaker economies who lack the global bargaining power of large economies such as China and India.

Beyond the legality of this inherited policy agenda lies the issue of policy optimality. One of the important lessons of historical experience is that import substitution policies frequently led to monopoly or collusive oligopoly and the ensuing limits to competition dulled industrial productivity growth. Another important lesson is that industrial licensing limiting capacity is a blunt and often counter productive instrument, particularly in diversified and specialised economies. With regard to export oriented industrialisation, the very success of major exporting economies such as China inhibits the space for other economies to replicate their paths. Thus garments exports from China to the US and the EU (and latterly from Bangladesh and other follower Asian economies) have severely constrained the possibilities for clothing exports from Africa (Kaplinsky and Morris, 2008).

⁹ The very success of major exporting economies inhibits the space for other economies to replicate their paths. For example, garments exports from China to the US and the EU have severely constrained the possibilities for clothing exports from Africa (Kaplinsky and Morris, 2008).

This is not to argue that all inherited policies are undesirable, suboptimal or inoperable. Many have been and are being used as individual economies find ingenious ways to circumvent constraining global agreements. But beyond this, it is important for the industrial policy agenda in the future to respond to the four disruptive challenges set out in the preceding sections. In what follows this paper briefly sets out some potential industrial policy responses, but given length constraints and the immaturity of many of these policy responses, these are discussed in only the most general form

Making the Most of Commodities: Building Linkages to the Resource Sector¹⁰

The inherited wisdom on the relationship between the industrial and the hard and energy commodities sectors is that there is a trade-off between resource exploitation and industrial development. A number of reasons are given for this pessimistic perspective. One core argument is that of the Dutch Disease (resource intensive economies suffer from high exchange rates which disfavour traded goods sectors such as industry). A widely held view is that growth rates in resource intensive economies have been lower than for comparative non resource intensive economies (Sachs and Warner, 2001). However, recent literature has contested this empirical finding, showing that if the measure of resource intensity used by Sachs-Warner is changed, this adverse growth correlation vanishes (Lederman and Maloney 2007). Related to this is the recognition that many of the now industrialised economies built their industrial sectors in a synergistic relationship with their resource sectors (Wright and Czelusta, 2004). The recent revival of energy-related industries in the US consequent upon the discovery and exploitation of shale gas further evidences the potential for building industry on the back of the resource sector.

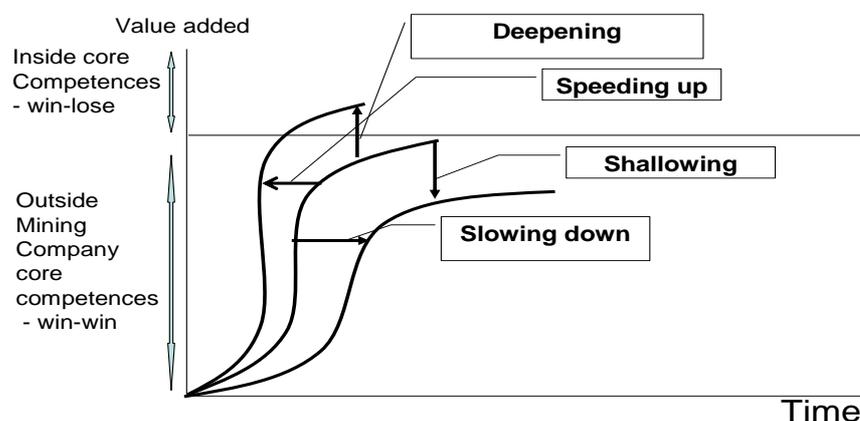
Another widely held proposition affecting linkage development has been the enclave thesis. Based on the work of Hans Singer and others, this argued that lead commodity firms have little interest in backward linkages and, moreover, the technological and scale intensity of many commodity sectors put linkages beyond the reach of local suppliers. However, the developments in GVCs which we discussed above in relation to the industrial sector are now extending to the resource sector. Contrary to the enclave thesis, lead commodity producing firms are displaying an active interest in outsourcing and linkage development. If local suppliers are reliable and low cost and produce to acceptable quality and delivery standards, they are a particularly favoured source of supply. Moreover, capabilities in many resource producing countries have grown immeasurably since Singer proposed his enclave thesis in the 1950s and 1960s.

The consequence has been that many backward linkages to the commodity sectors have been driven by market forces. They have unfolded “below the radar”, and the extent of development has been largely unobserved and unrecorded, particularly in low income SSA economies (Morris, Kaplinsky and Kaplan, 2013). Many developing economy governments remain acutely suspicious of the motives of the lead commodity firms, and fail to recognise the structural shift in their sourcing strategies. Thus instead of introducing a suite of policies designed to broaden, deepen and speed up linkages by collaborating closely with lead firms, the hostile policy environment has often acted to narrow, shallow and slow linkage development. This is graphically developed in Figure 1 which distinguishes between inputs which the lead firms are

¹⁰ This discussion is drawn from Morris, Kaplinsky and Kaplan, 2013.

anxious to outsource, that is those outside of their protected core competences, and those which they seek to hold onto and consolidate. It also shows the contrast between facilitative and obstructive policy environments

Figure 1: Different trajectories of linkage development



Source: Morris, Kaplinsky and Kaplan, 2012

Detailed analysis of linkage development in nine African economies shows that the extent of linkages is a function of six factors. The first is that it is commodity specific (different sectors clearly have varying degrees of technological and scale intensity), and reflects the level of industrial development in the host economy. Second, there is considerable scope for backward linkages in all three families of soft, hard and energy commodities, but that forward linkages in hard and energy commodities face bigger obstacles. Nevertheless, most governments are fixated with “beneficiation” (ie forward linkages) rather than backward linkages. And insofar as they do focus on forward linkages, these tend to be in large scale and capital intensive processes rather than in seeking to take advantage of niche markets being served by relatively small scale producers (Perez, 2008). The third influencing factor is infrastructure, which not only affects the cost of exporting resources, but also the natural protection afforded to local suppliers and their costs of inputs and logistics.¹¹ The fourth is ownership policies. These not only affect local versus foreign owners, but often different country-sources of foreign owners. For example, in Zambia, Chinese copper firms are more likely to source locally than their northern counterparts, but are also more likely to bring their home-country suppliers with them and less likely to invest in supply chain development (Fessehaie, 2012). Individual firms, even from the same home country, also have different strategic strengths and weaknesses and there is scope for playing these firms off against each other as a way of speeding up linkage development. Fifth, policies designed to develop local skills – not just professional skills but also many artisanal skills - are critical to industrial linkages. Less critical in the short run but central to success in the long run is the development of the institutions in the National System of Innovation. Finally, an important determinant of

¹¹ These two factors often act against each other. Whilst poor infrastructure often confers some benefits to local suppliers, more often it severely disadvantages them.

policy success is the formulation and delivery of policy itself. Linkages policies which were embedded in high level strategy, which embodied positive and negative sanctions, which were consistent with other policies, which were within the competence of the state apparatus and which were backed by “policy will” (a reflection of transparency and commitment) have been critical to the broadening, deepening and sped on linkage development.

Participating Gainfully in Global Value Chains

A range of low and middle income economies built their industrial sectors by participating actively in GVCs. The most notable recent example of this has been China, whose accession to the global economy in the latter 1980s led to vastly increased manufactured exports (often, as we have seen, with very thin levels of value added). These manufactured exports were an important component of both output and employment growth. However, one of the core lessons of GVC participation is that it is not so much a matter of whether to participate in GVCs, but how to do so. Unless attention is given to positioning in GVCs and in promoting the capacity to upgrade, then firms and economies can find themselves in a race to the bottom and locked into trajectories of immiserising growth (that is, increased activity, but with declining returns) (Kaplinsky, 2005).

From the perspective of industrial policy, four key agendas need to be addressed. First, the policy focus needs to switch from a focus on sectors to a focus on capabilities. For example, in the early 1990s the unit value of “shoe” exports from the Dominican Republic export processing zones was \$0.23. The capabilities in which the DR was specialising in this period were confined to assembly – every other input and part of the chain was imported – and the economy was locked into competition with other Caribbean assembly economies. Industrial policy was driven by exchange rate policy with the competing economies locked into spiralling rounds of competitive devaluation (Kaplinsky, 1993). Instead, a more appropriate policy would be to seek to systematically upgrade process capabilities and to engage in functional upgrading with a view towards enhancing product development and ultimately introducing own designs and own brands. In the Sinos Valley in Brazil, exports grew rapidly during the 1980s and 1990s (at one stage Brazil accounted for more than 12% of total global leather shoe exports), but this success was short-lived as global buyers shifted their sourcing to China which both had lower costs and an impressive upgrading trajectory (Schmitz, 2000). Thus the second policy agenda is to assist firms to systematically upgrade their capabilities (ie building dynamic capabilities), and in particular to develop a pathway which allows them to encompass functional upgrading as well as process and product upgrading. Figure 2 suggests a roadmap for this upgrading trajectory. This upgrading agenda is as relevant to firms operating in EPZs (as the Chinese have shown in some of their Special Economic Zones) as it is to firms operating in the wider and more regulated economy. Third, entry into GVCs at the low level (which provides the opportunity to create employment) is not just a function of low wages costs. This is the lesson being learned in SSA where many economies have lower labour costs than their Asian rivals. The wage competitiveness needs to be complemented with a low cost and efficient infrastructure, including both transport logistics and ICT.

Figure 2. A Roadmap for an Upgrading Trajectory.

	Process	Product	Functional	Chain
Trajectory				
Examples	Original equipment assembly (OEA) ↓ Original equipment manufacture OEM	Original design manufacture	Original brand manufacture	Moving chains – e.g. from black and white TV tubes to computer monitors
Degree of disembodied activities	Disembodied content of value added increases progressively 			

Source: Kaplinsky and Morris, 2001.

Third, each of the major chains is driven by a “chain governor”. These lead firms determine which market the chain feeds into. This is important since different markets have different margins and this influences chain incomes. The chain governor also allocates roles in the chain, and determines the capacity of individual firms to upgrade and the different upgrading paths which they can generate. The path of upgrading will again determine incomes in the chain. In most sectors, and particularly in consumer goods, chains governorship is becoming increasingly concentrated (Barrientos, Gereffi and Rossi, 2011; Nolan 2012), so that a core component of industrial policy is to assist domestic firms to develop strategic links with key lead firms. The capacity of the Brazilian government to induce Foxconn to assemble iPhones and other electronic goods in Brazil is a good example of this focused strategy).

Finally, value chains selling into high income markets under global brandnames are often very standards intensive (Gibbons and Ponte, 2005; van Tulder, 2013; Kaplinsky, 2010). The development of the capabilities to meet these standards requires support. Often this support is provided by the lead firms’ supplier development strategies, but these tend to steer clear of small and medium sized firms. Therefore policy needs to be developed to assist these excluded enterprises and to support the efforts of the included enterprises to develop the capabilities to meet the demands of an ever-changing standards agenda.

Endogenising the Environment in Industrial Policy

As observed above, two environmental challenges confront industrial development, not just in low and middle income economies, but globally. The first is to mitigate the harmful environmental outcomes of industrial activity. These arise in part because of externalities, that is, it is difficult for producers to limit environmental impacts to their own operations. In addition, many inputs with harmful external impacts are not priced

to reflect their real environmental cost to the community. This is notably the case with energy, but it also applies to other inputs such as chemicals.

Endogenising these negative externalities into the price system by forcing producers to cover the costs of their spillovers and to limit the use of harmful processes is one way of meeting these policy objectives. Another way is through regulation, placing statutory limits on industrial operations. Some of this agenda is currently being pursued in high income countries, but the consequence of this has often merely been to shift polluting activities to low and middle income countries. (Thus, much of the reduced energy intensity of GDP in the north reflects a process of increasing energy intensity in the south). This “global division of pollution” should be resisted. Low and middle income countries are risking severe social and developmental outcomes in the future by postponing a more robust policy agenda. Moreover, the costs of ex-post clean-up can often dwarf those of ex-ante prevention. And, further, as unfolding events in China and many African economies (where agricultural output is affected by pollution) have shown, the failure to address these environmental issues may undermine security and the social legitimacy which underpins sustainable industrial growth.

The second environmental challenge confronting industrial policy is to take advantage of the opportunities opened to add value in industry by developing the green economy. This is a path being pursued by a number of high income economies, but the potential is not limited to these northern economies. There is considerable scope for doing so in low and middle income economies. For example, and although this is largely outside of the industrial sector, ecotourism is a high margin service sector niche. In the industrial sector, Chinese and Indian firms are increasingly dominating wind power generation, and Chinese firms command the global solar PV sector. Some middle income economies in Africa are also building green-economy expertise, particularly in renewable energy. Industrial policy has a role to play in supporting the growth of these green economy activities.

Promoting a More Inclusive Industrial Sector

The exclusion of considerable sections of the population from the growth process as a whole is of concern not just for developmental reasons, but also because it threatens to undermine the environment for (and hence sustainability of) growth, including in the industrial sector. Whilst much of the explanation for these developments arises outside of the industrial sector, the nature of industrial development does play a causal role. Large scale production concentrates the benefits in terms of geography and income recipients. Capital intensive production limits the employment impacts of industry, and further acts to concentrate the rewards to a relatively small section of the population. Historically these problems have beset low and middle income economies, but they are increasingly also emerging in the north, particularly amongst the young population. (In 2013, around 60% of the under 25s in Greece and Spain were unemployed; in the EU as a whole the proportion was almost 20%).

A more inclusive industrial trajectory will need to develop products which are more appropriate to meeting the needs of the poor and the excluded, and it will have to do so by developing processes and technologies which are more labour intensive, smaller in scale and which provide opportunities for the relatively uneducated to participate in

production. There are important implications for innovation policy as well as for the promotion of relevant sectors and regions (Chataway, Hanlin and Kaplinsky, 2013).

How can this enormous task be achieved? One route, as discussed above in relation to the endogenisation of environmental concerns in industrial policy, that is, through the price system. Large scale firms can be forced to pay for the congestion and infrastructure costs arising from their operations. Factors (such as labour) can be priced to more accurately reflect their opportunity costs. But this is a dangerous path, since a reduction of wages in many economies may further reduce the incomes of the poor and by simultaneously increasing profits, accentuate inequalities in income.

A second route for policy designed to promote more inclusive development is to focus on the entrepreneurs responsible for industrial investment. Here we can distinguish large TNCs (many of whom seek to target “the fortune at the bottom of the pyramid”), large local firms, domestic SMEs, community based investors and public private partnerships (as in health related sectors). Each of these has the potential to contribute to more inclusive patterns of growth, in some cases as part of their core growth agenda (for example, community based investors) and in other cases as part of their wider operations (for, example TNCs). Policies should be designed to specifically target the incentives and support provided to each of these categories of investors such that they consolidate their investments in more inclusive enterprises.

A third arena for policy is to focus on innovation systems. These have historically produced capital intensive and large scale technologies, working predominantly with the formal sector and large scale capital. Research and Technology Organisations (RTOs) and educational systems need to be reoriented to develop technologies which are more likely to foster inclusive growth, in relation to producing products appropriate for the poor and excluded, to include the poor in production and to involve the poor and excluded in the innovations system itself.

Conclusions

How do we put the various elements of this story together? On the one hand we can observe a (re)new(ed) legitimacy for industrial policy. On the other hand, many of the policy instruments of previous generations of industrial policy are circumscribed by international agreements such as the WTO; moreover, some elements of the inherited policy framework have been proven to be suboptimal or inoperable. All of this occurs in the context of four disruptive factors which frame the contemporary industrial policy environment – the commodities price boom; the onward march of GVCs; the need to endogenise the environment into the industrial sector; and the critical need to develop more inclusive patterns of industrial growth.

The first conclusion is that industrial policy is contextual. It varies not just over time (as we have seen), but also between economies and in the implications for individual sectors. There is thus no “one size fits all” suite of policies to draw on, even though any particular policy ensemble will need to relate to the changing conditions for industrial sector development.

The second conclusion is that the phrase “industrial policy” is in fact a misnomer. As GVCs have fractured, many of the activities which were previously within the operations of industrial firms (for example, design, logistics, marketing) have become specialised outsourced activities which are located in the service sector. Yet without them, industrial activities such as processing and assembly have little strategic substance. Thus instead of “industrial policy” what is required is “productive sector policy” affecting all sectors and the links between different economic sectors. The generalised agenda is the pursuit of rents through the development of dynamic capabilities rather than the promotion of individual “whole sectors”.

Third, a lesson can be learned from the analysis of linkage development in Africa discussed above. “Policy” consists of a series of discrete but related and integrated elements – a strategic vision; individual policies which embody positive and negative sanctions; joined-up policies which are mutually supportive; policies which are within the ambit of government capabilities; and the “will” and legitimacy to execute these policies effectively.

A fourth and related conclusion from the analysis of linkage development in Africa is that these policies are not confined to government. Each of these policy challenges also involves the private sector as well as non market actors such as civil society organisations and hybrid public private partnerships. Critical to this is the role played by lead firms, particularly when production occurs in the context of global value chains. This therefore requires a process of value chain alignment in which policy is developed and implemented by a consortium of actors within the value chain and in concert with the state and the national system of innovation. But this “concert” requires a “conductor”, which in some cases might be the lead firm, and in other the state. Context matters in this orchestra.

Fifth, some policies lie within the ambit of national governments, other within the reach of sub-national regional governments. But other policies requires development at the supra-national level. For example, and with relevance to Africa, infrastructural development is necessarily pursued at the regional level (African Development Bank Group, 2009). In other cases, global agreement is required, particularly with respect to policy challenges involving external economies (notably with respect to energy and the environment), and those subject to a race to the bottom as countries engage in wars of incentives (for example, competitive devaluations, fiscal policies and intellectual property rights).

Sixth, depending on circumstances, productive sector policies may involve walking on more than one leg. Countries with few natural resources and large pools of low cost and unskilled labour may place greater emphasis on participating in GVCs (subject to systematically promoting the capacity not upgrade); those with resource abundance and adequate size may favour to emphasise the linkage path. Other economies may choose to pursue both paths simultaneously. But all economies - irrespective of size, resource endowment and location - will perforce need to find ways of endogenising the environment into productive sector development, and to give explicit consideration to developing more inclusive patterns of productive sector development.

Finally, policies designed to promote the productive sector are best seen as a “journey of discovery” (Rodrick, 2004). It is a process which recognises the simultaneous existence of the government failures trumpeted by the critics of industrial policy (for example Bhagwati and Desai, 1970, Little, Scitovsky and Scott, 1970; Lal, 1983) and the market failures highlighted by the proponents of industrial policy (for example, Chang, 2002; Mazzucato, 2011). Mintzberg, Quinn and Ghoshal, 1998) speaks of the need to promote “emergent strategies” in the corporate sector, a rolling-plan reflecting a process of continuous review and adjustment as market conditions change. This applies equally to the productive strategy, but exercised at a large scale in which the key stakeholders align their individual endeavours to achieve collective efficiency.

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