

Why Indonesia Needs a More Innovative Industrial Policy

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Abstract. *In this paper the case is made that industrial policy in Indonesia should be based on recognition of the entrepreneurial economy and promotion of knowledge acquisition and commercialization through investments in research and development (R&D), human capital, and information and communication technology. Moreover, the current industrial policy framework may not take sufficiently into consideration that the external environment wherein Indonesia needs to industrialize, requires a completely different process than one based on the attempted creation of national industries or national champions, or on attracting investment through fiscal incentives or subsidies, as in the past. New challenges, such as industrializing in a global economy where production is fragmented, where the importance of knowledge and entrepreneurship is replacing the old 'managerial economy', and where the nature of manufacturing itself is changing, are discussed in this paper, and their implications for industrial policy drawn out.*

Keywords: *Industrialization, manufacturing, innovation, development, entrepreneurship, Indonesia*

JEL codes: *O14, L50, L52, O25, L60, L16, L26, F13, H87*

Introduction

In this paper¹ I make the case for a shift in emphasis in Indonesia's industrial policy towards being more focused on the promotion of innovation and entrepreneurship. Industrial policy is 'the process whereby governments aim to deliberately affect the structural characteristics of their economies'² (Naudé, 2010a:2). It is a country's attempt to 'defy' its comparative advantage and develop its 'latent' comparative advantage (Amsden, 1989; Chang 2002; Lin and Chang, 2009).

Indonesia has always had an active industrial policy – after the introduction of the 'New Order' in 1966 and the late 1990s the country's industrial policy evolved through various stages, from being import-substitution oriented, to being export-oriented, and in between also had an emphasis on investment in heavy and new industries (such as aircraft production). During this period, not all elements of industrial policies were successful at all times, and the shift from protectionism towards export-orientation in the 1980s was a reaction against the growing ineffectiveness of earlier policies that was based on easy oil-boom money. Overall however, the period 1966 to 1997 saw the

¹ This paper relies on Naudé (2010a; 2010b), Szirmai, Naudé and Alcorta (2013) and Naudé, Szirmai and Lavopa (2013).

² This is close to Pack and Saggi's (2006:1-2) definition of IP as 'any type of selective government intervention or policy that attempts to alter the structure of production in favour of sectors that are expected to offer better prospects for economic growth that would not occur in the absence of such intervention'.

successful industrialization of Indonesia, with manufacturing's share in the economy rising from 10 % to around 30%.

After the 1997 Asian Crisis, and the resignation of Suharto in 1998, industrial policy seems to have taken a backseat to the establishment of financial stability, with many commentators and scholars re-interpreting the industrial success of the previous period as due to favorable macro-economic and other 'neoliberal' policies, and not selective industrial policies (Rock, 1999). Nevertheless, Indonesia did adopt a new industrial policy in 2005-2008³ with the vision that '*In the year 2020 Indonesia shall become a New Industrial Developed Country*'. In this the focus is on the selective promotion of certain industries, in particular agricultural based industries (e.g. palm oil, cocoa, or aquaculture), transportation goods (shipbuilding or aerospace), and ICT industries, mainly through the provision of financial incentives (e.g. tax breaks, rebates). Despite the focus on macro-economic stability, financial prudence and the move towards new industrial support measures, the period since 2000 has not been one of continued successful industrialization. Indeed, between 2000 and 2012 the share of manufacturing in the economy has shrunk, and the country seems to have embarked on a path towards de-industrialization (AswicaHyono *et al.*, 2013; Raz, 2013; Thee, 2005; Dhanani, 2000).

Given the current set of socio-economic challenges facing Indonesia, including the needs to sustain growth, to creating more jobs for young labour-market entrants especially in urban areas, and to diversify the economy and exports away from natural resource dependence and exploitation, the importance of an appropriate industrial policy that will steer industrialization is clear.

In this paper I argue that the current set of industrial policy initiatives need to focus more on the entrepreneurial economy, and on promoting technological upgrading. An appropriate industrial policy should be based on recognition of the entrepreneurial economy and promotion of knowledge acquisition and commercialization through investments in research and development (R&D), human capital, and information and communication technology. Moreover, as I will point out, the current industrial policy framework may not take sufficiently into consideration that the external environment wherein Indonesia needs to industrialize, requires a completely different process than one based on the attempted creation of national industries or national champions, or on attracting investment through fiscal incentives or subsidies, as in the past. The important fact is that not only does the nature of the global economy pose particular challenges to latecomer industrializing countries, but that the nature of manufacturing itself is changing. Manufacturing is globally undergoing a revolution, often referred to as the "new" industrial revolution, wherein networked manufacturing, niche production and mass customization are significantly changing the nature of manufacturing and blurring the distinctions between manufacturing and services (see e.g. Marsh, 2012).

The paper is structured as follows. In section two I ask why manufacturing (still) matters to Indonesia. Then in section 3 I discuss the reasons why an appropriate industrial policy framework is needed to avoid de-industrialization in Indonesia, and why the current policy framework may be inadequate. In this section the emphasis will be on the importance of entrepreneurship and innovation as a basis of industrial policy. Section 4 concludes by asking how the dangers of industrial policy may be minimized.

³ See the *Presidential Regulation 28/2008 on the National Industrial Policy and* <http://www.bi.go.id/NR/rdonlyres/33A4EB52-291E-4D88-B742-5D13DB2E6F0E/9535/Policyondevelopmentofnationalindustry2008.pdf>

Why Manufacturing Matters for Indonesia

The Benefits of Manufacturing

Manufacturing is desirable not only for its higher productivity impact, but also its contribution to economic diversity. This reduces a country's vulnerability to negative external shocks. Indonesia has been, and remains, vulnerable to external shocks, as the impacts of the Asian Financial Crisis of 1997 and 2008 Global Financial Crisis amongst others have shown. Structural change is also necessary to absorb job-seekers into rapidly growing urban labor markets and to reduce poverty. According to Rodrik (2007:6) 'development is fundamentally about structural change'. Structural change involving an increase in the share of manufacturing is associated with an increase in development as measured by per capita GDP⁴.

The manufacturing sector itself may be 'different' (from say agriculture) in being able to generate positive externalities (Szirmai, 2009; Tregenna, 2013). To be specific, the manufacturing sector generates 'Marshallian' externalities due to knowledge spillovers within the industry (technology diffusion), linkages (backward and forward) with the rest of the economy, dynamic economies of scale, and labour pooling (Harrison and Rodriguez-Clare, 2009; Tregenna, 2013). Substantial learning by doing is required to become proficient in manufacturing (Young, 1991); however the requirements of firm-specific learning strategies may justify selective government intervention (Aghion, 2009; Deraniyagala, 2001).

Empirical studies, not surprisingly, often find the manufacturing sector to be the most important source of growth in developing countries. Manufacturing was also the most important source of growth in advanced economies during 1950 to 1973, before the rise of the services sector (Szirmai, 2009). Moreover, to a greater extent than agriculture, manufacturing activities can cluster, which increases proximity between economic agents, which in turn increases the magnitudes of the spillover effects. Rosenthal and Strange (2005) provides estimates of the size of such agglomeration externalities, suggesting that they are significant.

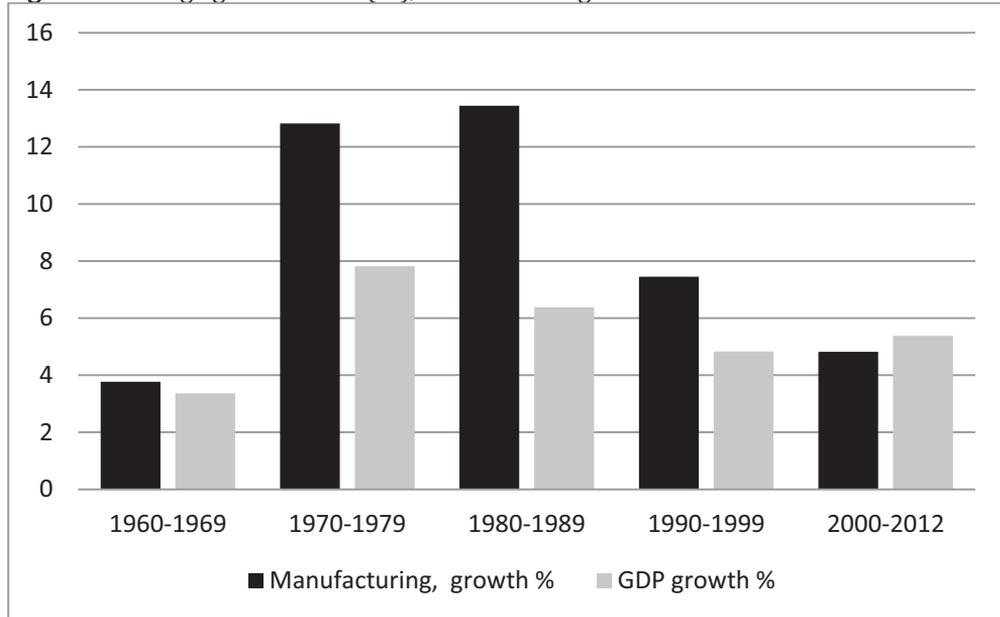
In Indonesia, the development and growth of the manufacturing sector has been a driving force behind economic growth, per capita income and poverty alleviation in the past. Figure 1 shows the average manufacturing growth rates from 1960 compared with average GDP growth rates. It shows that at least until the 2000s, manufacturing growth had always exceeded GDP growth; manufacturing may also be important (although at present not sufficient) for poverty reduction: not just by creating jobs, but also by often creating better quality jobs. For instance around 69% of manufacturing sector jobs in Indonesia is in the 'higher-value formal sector' which offers better wages and working conditions than many more informal jobs (World Bank, 2012) and even better wages than in the services sector (World Bank, 2011).

The importance of expanding high-value added formal jobs in manufacturing is emphasized by two facts: first that by 2009 there were still 32.5 million Indonesians living in absolute poverty, even more than in 1990 when 27.2 million were living below the poverty line (Prasetyantoko, 2013). Every year 1.5 million new workers enter the labour market (World Bank, 2011:35). Second that the population of Indonesia is

⁴ To be precise the relationship between the share of manufacturing in GDP and per capita GDP follows an inverse-U shape (Imbs and Wacziarg, 2003; Buera and Kaboski, 2008) or an S-shape (Weiss, 2009). According to Buera and Kaboski (2008:10) the share of manufacturing in GDP will rise as a country develops, and will reach a turning point. In a sample of 21 countries they found this turning point at an average per capita income of around US \$ 7,100, after which the relative share declines and the share of the services sector continues to rise.

rapidly urbanizing, for instance the country will soon reach the tipping point where more than 50% of the population will reside in cities, and the largest city, Jakarta, is estimated to increase in size to more than 11 million people by 2020. The need to provide jobs for these urban migrants, so as to address urban squalor, congestion, crime, instability and rising inequality is obvious.

Figure 1 Average growth rates (%), manufacturing value added and GDP



Source: Author's compilation based on World Development Indicators

Industrialization and de-industrialization in Indonesia

Aswicahyono *et al.* (2013) provides an in-depth overview of the industrialization of Indonesia. In their analysis, Indonesian industrial development since the 1960s underwent four phases (Aswicahyono *et al.*, 2013: 197):

First, after decades of stagnation, Indonesia began to experience very rapid industrialization following the major political change and economic reforms of 1966–67. Annual industrial growth was at least 9 per cent in all but two of the 27 years, 1970–96 ... Initially, catch-up and import substitution were the principal drivers. There was a decade of oil-driven growth, and the beginnings of a brief and costly heavy industry strategy. From the mid-1980s, labour-intensive exports became a significant engine of growth. This growth came to an abrupt halt with the crisis of 1997–98. The contraction in the manufacturing sector was about the same as for the economy as a whole of 13 per cent. Thereafter, positive growth has been recorded from 1999, but at lower rates than pre-crisis.

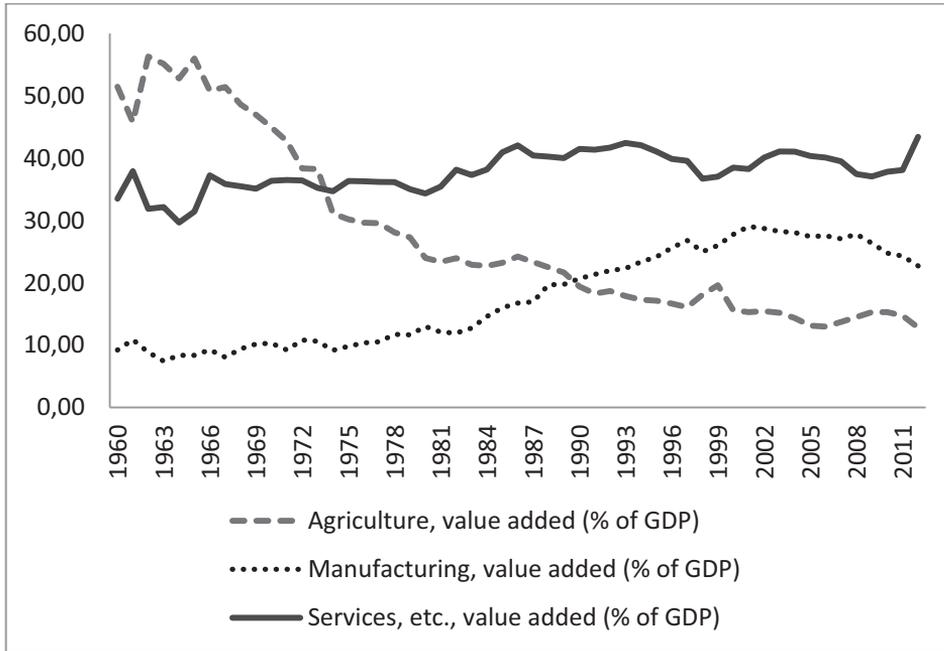
Figures 2 and 3 provide a snapshot of the manufacturing sector's performance in Indonesia, and hence of the structural changes that the economy has seen, since the late 1960s.

From Figure 2 can be seen that the share of manufacturing had increased significantly in Indonesia since 1966⁵, from around 10% of GDP to almost 30% at the time of the Asian crisis. Many commentators have discussed this period of rapid

⁵ The period 1966 to 1998 is referred to as the Suharto era, or 'New Order'.

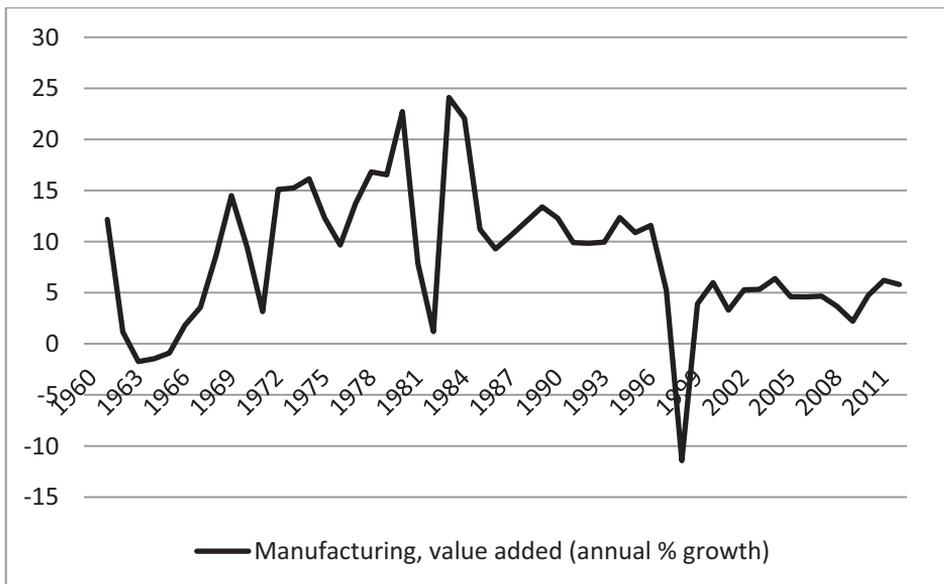
industrialization and have acknowledged the remarkable achievement that it entailed, e.g. Lewis (1994). Since the late 1990s however, the share had been declining, to around 22 % at present. This is also reflected in Figure 3, which shows that from around 1966 manufacturing growth rates were extremely high in Indonesia, but that

Figure 2 Structural Change in Indonesia, 1960 - 2012 (Sectoral Share in GDP (%))



Source: Author's compilation based on World Development Indicators

Figure 3 Growth of Manufacturing in Indonesia, 1960 - 2012 (%)



Source: Author's compilation based on World Development Indicator

the Asian Crisis of 1998 represents a structural break in the growth performance of manufacturing – although manufacturing growth had started to slow already around

1993 (Dhanani, 2000). Since 2000 growth of the sector has been around 5% per annum, whereas between 1970 and 1997 the average annual growth rate in manufacturing was 12%.

Why did manufacturing in Indonesia not recover fully after the 1997 Asian Crisis? Aswicahyono *et al.*, (2013:213-214) points out

The slowdown in manufacturing growth, from well above the economy-wide average to just below it, is the most puzzling result. As a tradable goods sector, like agriculture, it benefited from the competitive boost of a depreciating exchange rate in the wake of the Asian financial crisis. Moreover, the sector faced no significant demand-side constraints until the recent global financial crisis... manufacturing is no longer the leading growth engine it was prior to the crisis.

According to Aswicahyono *et al.*, (2013:221) the declining contribution of manufacturing to the Indonesian economy was due to “excessive regulatory policies and under-investment in key supply-side inputs”. Under regulatory policies they mention the rising cost of labour and other labour market rigidities. Between 1990 and 2008 unit labour costs in Indonesia indeed increased by 8 % per annum – more than the growth in labour productivity. This has been estimated to have contributed to a decline in manufacturing exports⁶ (World Bank, 2012) while the economy had also largely struggled to diversify exports (Taufik, 2013). It has also been the case that much of the growth during the 1970s were funded from the oil- boom of the period (1974-1981) through subsidies and financial support to state-owned enterprises, which however by the mid-1980s had turned into “questionable quality”, proved difficult to remove (Lewis, 1994:1) and had resulted in patronage and rent-seeking increasing (Rock, 1999). Even the switch to an export-lead industrial development strategy in the 1980s failed to result in any significant exports of high-value added goods.

Aswicahyono *et al.*, (2013) also mention that the global commodities boom caused an over-valuation of the exchange rate by the mid-2000s, which adversely affected the competitiveness of the entire manufacturing sector. Much the same slower growth in manufacturing took place over the same time in Russia and South Africa, two other similarly mineral-rich middle-income countries. At the same time, the competitiveness of manufacturing was further compromised by ‘non-wage cost increases caused by the high facilitation costs associated with doing business in Indonesia’, as well as by ‘the absence of technological upgrading’ and the ‘...wide prevalence of smuggling, particularly of consumer electronics’(Thee, 2005:8).

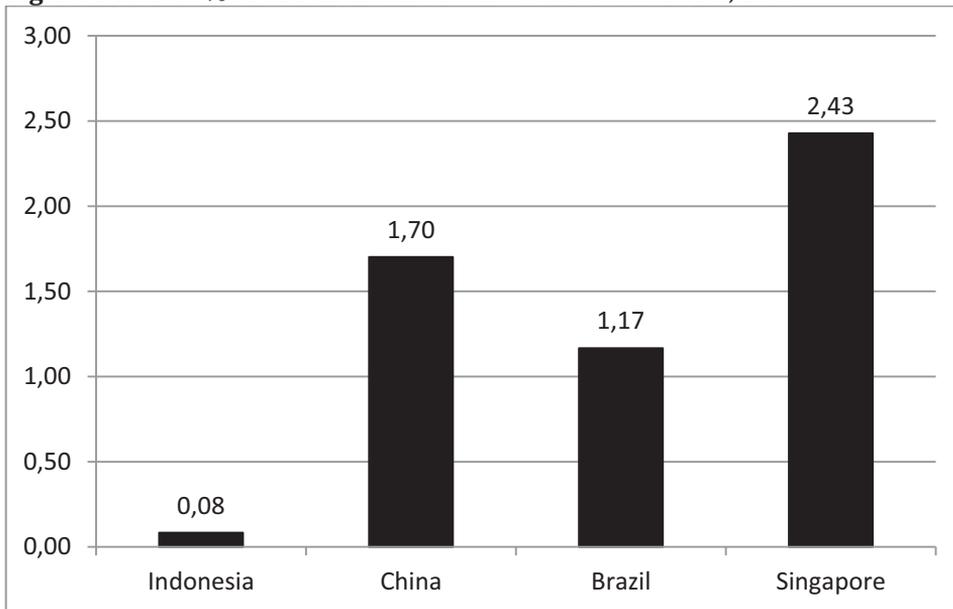
Higher labour productivity, export diversification, and improvements in the domestic conditions for doing business are therefore essential objectives that need to be attained for the manufacturing sector to improve and play a stronger role as engine of growth in Indonesia. Labour productivity is most often enhanced by adoption and use of better technologies and managerial practices, and export expansion by producing the type of goods that shifting global demand requires. Both of these - technology/management practices and expansion on non-traditional exports - require a greater investment in innovation and entrepreneurship. One may argue therefore that it is a lack of entrepreneurship and innovation that is fundamentally at the root of the decline in the manufacturing sector in Indonesia.

It is therefore precisely in these areas that industrial policy in Indonesia should focus more. For instance, current indicators of science and innovation and productivity growth in manufacturing in Indonesia paint a relatively unfavourable picture.

⁶ According to the World Bank (2011:33) the share of manufacturing firms who directly exported more than 10% of output in Indonesia declined between 2002/2004 and 2007/2009 from 14.4% to 11.6%.

Decompositions of manufacturing growth has found it to have been driven in the past more by extensive growth, i.e. just adding more labour and capital to increase production, rather than by increases in total factor productivity (TFP) (Sari, 2004). The OECD's *Science, Technology and Industry Outlook* reports that 'Indonesia's innovation performance appears weak on various measures compared with other countries in Southeast Asia, and with successful industrializing countries such as China'. Based on the available data, Indonesia's gross expenditure on R&D is less than 0.1% of GDP' (OECD, 2010:188). In 2009 there were almost 10 times as many researchers per million people in China, than in Indonesia (World Development Indicators). Figure 4 compares R&D spending as % of GDP in Indonesia and selected emerging markets in 2009.

Figure 4 R&D as % of GDP In Indonesia and Selected Countries, 2009



Source: Author's compilation based on World Development Indicators

According to Thee (2005:9) Indonesia's manufacturing sector suffers from the following specific technological weaknesses, namely a '*shallow and backward technological base, particularly compared to that of the East Asian Tigers; weak and narrow domestic capabilities for absorbing and improving upon complex imported technologies; an underdeveloped capital goods sector; and the relatively small amount of technological effort, which was concentrated and distorted because of the focus on highly subsidized and protected hi-tech industries*'. Dhanani (2000:3) also mentioned 'weak capacity for technology absorption and adaptation 'as a constraint on innovation and productivity growth. Furthermore a 'brain drain' of skilled workers and limited participation by universities and business chambers in R&D has been identified as shortcomings of the innovation system in Indonesia (Taufik, 2013).

The *National Industrial Policy (NIP)* of Indonesia recognizes the importance of manufacturing, and has identified three selected or key 'future' sectors for promotion through certain industrial support measures (e.g. subsidies, tax breaks, import tax rebates, etc) (Taufik, 2013). These three sectors are all sectors where changes in manufacturing, driven by technology and innovation, will be essential to manage in future. Whether in *agricultural based industries* (e.g. palm oil, cocoa, or aquaculture); or *transportation goods* (shipbuilding or aerospace) or *ICT industries*, the nature of products and their embodied technologies are rapidly changing. In all of these

industries, Indonesia is producing well within the world's technology frontier, and are often less productive and less competitive than other emerging economies such as China, India, Malaysia and Brazil, to mention a few. Nevertheless, technological upgrading and innovation is not amongst the '15 President's Specific Priorities for Indonesia and last (11th) on the list of National Priorities for Indonesia (Taufik, 2013). Moreover, as Thébault-Weiser (2008) point out with reference to the key selected sectors in the National Industrial Policy, they are selected

'despite the fact that they are long established in Indonesia. This is symptomatic of Mol's focus on preserving existing, and even failing, industries rather than facilitating the establishment of new pioneer industries. For example, in January, Mol [Ministry of Industry] announced that it is considering providing fiscal incentives to investors willing to take over collapsed footwear manufacturers'.

Industrialization Requires Technological Upgrading: Lessons from Other Countries

Although Hobday (2013) caution against simplistic drawing of lessons from other countries' industrial success, the New Industrial Economies all had in common the centrality of education and skills formation, and the absorption of foreign technology through the accumulation of knowledge and technological capabilities. According to a fairly substantial but fairly recent literature (see e.g. Cimoli et al. 2006; Fagerberg et al., 2007) industrial catch-up is indeed fundamentally dependent on innovation (the generation of new knowledge⁷) and capability accumulation (Lucas, 2008; Dosi, 2009). Successful innovation and capability accumulation in turn requires the development of 'national systems of production and innovation' (Nelson, 1993) which consists of learning, development of absorptive capacities and an environment conducive to the commercialization of innovations (Cimoli, et al., 2006).

Technological capabilities are an important concept in growth theory, where technological innovation is central in productivity growth (see also Cimoli, et al., 2006). This is also why I wish to emphasize this as the core element or pillar in a new industrial policy for Indonesia – to improve the country's extent of technological innovation; and degree and rate of capabilities accumulation and adoption (see also Dosi, 2009). Lall (2004:5) describes technological capabilities as the skills firms 'need to utilize efficiently the hardware (equipment) and software (information) of technology'. These are firm and sector specific so that support for such capabilities will rarely be effective if not specific. As Ha-Joon Chang states 'technological capabilities are acquired in an industry-specific manner through actual production experiences' (Lin and Chang, 2009:494).

Examples of industrial policies which resulted in successful innovation and capability accumulation includes that of Finland (associated with the success of Nokia), Japan (associated for instance with the success of Toyota and Sony) and South Korea (associated with the success of Samsung and Posco). As described by Ha-Joon Chang (in Lin and Chang, 2009:497)

'the market gave Finland, Japan, and Korea unambiguous signals that they should not promote those industries; all the companies in those industries ran losses or earned profits on paper only because they were subsidized by profitable companies in the same business group and/or by the government'.

⁷ According to Lucas (2008:1) the industrial revolution contributed to rapid economic transformation as it was made possible – and further enabled – the process of generating new knowledge : 'the industrial revolution involved the emergence of a class of educated people, thousands – now many millions – of people who spend entire careers exchanging ideas, solving work-related problems, generating new ideas'.

In contrast to the above mentioned successful examples, industrial policy has failed in Sub-Saharan Africa (SSA) (e.g. Collier and Venables, 2007; Jalilian et al., 2000; Killick, 1978, Lall and Wangwe, 1998; Pack, 1993; Robinson, 2009). It is moreover also accurate to point out that although after industrial policy was rolled back in the 1980s and 1990s under the auspices of the World Bank and IMF, many African countries experienced significant de-industrialization of whatever manufacturing was build up previously (Carmody, 2009; Page, 2009). Lall (2004) has argued that Africa's failure to industrialize has been due not so much as a result of rent-seeking and corruption that made industrial policy ineffective and even counter-productive, but that it had been partly due to wrong content of industrial policies. He argued that African countries' industrial policies had tended to under-appreciate investments in human capital formation and physical infrastructure had made entry and exit for private sector firms difficult, and made wrong and ineffective interventions in technology transfer. Is this also the case presently with industrial policy in Indonesia?

Thus, having argued in this section that manufacturing matters for Indonesia's development, but that de-industrialization is a threat, that the current industrial policy does not focus sufficient on innovation and entrepreneurship, nor on innovative and new industries, and that the experience of successful industrialization in recent decades in for instance East Asia and Finland emphasized the need for technological innovation, the next section makes the case much sharper for a rethink of Indonesia's current policies.

The Case for (innovation-promoting) Industrial Policy in Indonesia

The case for a more innovative industrial policy in Indonesia, with a focus on entrepreneurship and technological upgrading, has both fundamental and pragmatic arguments. The fundamental arguments relate to the need for government to address market failures in innovation and entrepreneurship that limit development of manufacturing, and to lead the coordination of the complex network of interrelated inputs that are necessary for successful industrial development. The pragmatic arguments relate to changes in the global environment within which the Indonesian industrial sector has to develop. There are a number of new challenges in this external environment that dictates a different approach towards industrial policy. I discuss the fundamental arguments in section 3.1, and the practical arguments in 3.2.

Fundamental arguments

Government intervention in manufacturing development in Indonesia is needed to (i) correct market failures and (ii) overcome coordination failures. Market failures are due to positive externalities inherent in some economic activities. To these we can also add, since it will be important for the type of industrial policies that Indonesia should focus on in future, the externalities associated with entrepreneurial market entry. Hausmann and Rodrik's (2003) argument is that entrepreneurial entry in developing countries generates information about what the country may have a latent comparative advantage in. Thus industrial policy should be a process of 'self-discovery' of what the economy is good at producing. Because leading or early entrants suffer the cost (without necessarily the benefits) of early entry, entry itself may be suboptimal. Forms that such 'self-discovering' industrial policy can take could be support for small and medium enterprises (SMEs) to innovate, support for new firm start-ups, e.g. through reducing regulations and requirements and/or providing subsidized credit. It is still more difficult and expensive to start a business in Indonesia than in other economies in the Asia-Pacific Economic Cooperation (APEC) region, according to the World Bank's Doing Business Indicators.

More importantly though in the Indonesian context industrial policy should do more on promotion of private sector R&D and the strengthening of ties between business associations, private firms and university research efforts. In this regard, Dhanani (2000:10) has already pointed out some time ago that crucial market failures exist in Indonesia with respect to innovation; in particular he stressed that the Indonesian government needed to do *'a great deal to promote industrial technology development, but of a very different sort from before. It needs an effective framework of policies to overcome the numerous market failures that firms inevitably face in their quest for technological deepening'*. The previous efforts at technology promotion that he refers to, and which characterized Indonesian technological upgrading efforts in the 1980s and 1990s, were dominated by state-owned enterprises which did not involve the private sector or universities, and by foreign firms who did not transfer or disseminate their technologies to the domestic context. Hence neither the state nor foreign direct investment (FDI) had been sources of technological renewal in Indonesia in the past (as for instance it had been in China), and this played a large part in the stagnating growth in the manufacturing sector (Dhanani, 2000). Even more recently, industrial policy support measures were criticized for being too much supply-driven with little participation of the business sector and business chambers (Thébault-Weiser, 2008).

A second reason for government intervention through industrial policy to get manufacturing growth and employment higher is due to coordination failures. These arise because of the complementarities between economic activities and infrastructure, that when absent, creates low-level equilibrium traps. For instance coordination could be necessary in the case of technologies which lead to increases in productivity and in the optimal scale of production, such as electricity, roads bridges and fiber optic cables, for example. The need for coordination arises as these technologies most often require high initial fixed costs such as credit facilities, inter-sectoral coordination, and mass consumer demand (Buera and Kaboski, 2008).

Indonesia is a large country, with 250 million inhabitants spread out over a large geographic area of almost 2 million km² and 400 inhabited islands, and governed through a decentralized system over 300 ethnic groups. The government has identified six Indonesian Economic Development Corridors (IEDCs) for the spatial concentration of industrial and other activities (Riwa, 2011; MIRI, 2011). In such a setting, the demands of close coordination of investments in agro-processing, transport goods manufacture and ICT production will pose a tough challenge. Not only will coordination be needed to ensure that the needed complementary inputs, including skills and physical infrastructure are in place to support these three strategic areas, but the spatial clustering of the various assembly activities and support services will also have to be coordinated. The benefits are that, not only forward and backward linkages in manufacturing can be developed, but also that government coordination of supporting infrastructure and services can be focused in a particular geographic area and need not be provided across the entire Indonesia, making it potentially less costly (see also Collier and Venables, 2007). And as Rodrik (2004) has pointed out, coordination can often be done without large financial outlays on direct subsidies being needed as the current industrial policy requires; coordination often requires only government information, communication, persuasion and guarantees, which can then unlock the simultaneous private sector investment that is needed. This was probably in the past the reason why industrial policy had results under the 'New Order', where according to Rock (1999) a broad national consensus was established between the political elite and the Indo-Chinese business elite; this consensus may have facilitated *de facto* property rights as well as coordination between government and the (limited) private sector. After the reforms of the post-1998 period however, significant decentralization of

political power took place, and the tasks of coordination had become in a sense more difficult to achieve, and the 'scramble' for patronage more extensive.

Pragmatic Arguments

The global environment in which Indonesian businesses find themselves is radically different from that in which the earlier generation of countries industrialized, and also from the period of the 'New Order'. This provides what I term pragmatic arguments for an industrial policy that fosters innovation and entrepreneurship. There are two dimensions to this argument, or two key aspects in which the current environment is different, and necessitates different content in industrial policy than from what it current entails. These two dimensions are (i) the challenge of the increasing globalization of the world economy, most pertinently the rise of global production sharing and the rise of 'smart' and networked manufacturing, and the (ii) rise of what has been termed the 'entrepreneurial economy'.

(i) Global Production Sharing and Smart, Networked Manufacturing

Globalization is now characterized by supply chains which are now controlled by a number of large multinational enterprises (MNEs) in production and buyer-lead networks organized by retail firms (Pack and Saggi, 2006). In this 'vertical specialization' or 'unbundling', trade in intermediate goods have in particular become more important and has contributed significantly to growth in world trade (Ricotta, 2009; Yi, 2003). Lead firms in these global supply chains set minimum requirements for product quality from Indonesian firms that wish to break into these supply chains (Altenburg, 2009).

As a result of these supply chains and the accompanying greater market concentration, country's like Indonesia's labour cost advantages, to the extent that it has not yet been eroded, may not be as useful anymore (ul-Haque, 2007). Also, as phrased by Hart (2001:3-4) 'if supply chains are becoming more global, then efforts to promote industries by insisting that supply chains be national are unlikely to succeed'. This means as Collier and Venables (2007) stress that it now becomes more difficult for trade policy interventions to make a distinction between final and intermediate goods in designing an appropriate import tariff structure, as many so-called final goods are in fact further inputs in the global chain.

The evolution of global supply chains have also been accompanied by the greater international mobility of labour – and especially of talent (Ulltveit-Moe, 2008) -which has implications for government policies towards taxes, immigration, land ownership and remittances amongst others. Without appropriate talented workers and managers, countries' firms will not be able to participate in global value chains.

The challenge for industrial policy in Indonesia given this is to assist potential firms and industries to break into these producer and buyer networks or supply chains and to attract and retain talent. In this the country face not only challenges, but also opportunities, such as the reductions in ICT costs, and the fact that specialization induced by the unbundling of production may allow for the learning process to be more confined and incremental (Collier and Venables, 2007).

Perhaps a more substantial challenge, but also rich entrepreneurial opportunity is posed by the IT-revolution that is changing the very nature of manufacturing. Marsh (2012) has argued that a 'fifth industrial revolution' is changing the very nature manufacturing. Nowadays, 3D-printing has passed the stage of novelty in Europe and the USA, and 3D 'printing farms' as being established in many places. 3D-printing is an example of networked production and mass customization whereby anyone can produce his or her own product by designing it on the internet and sending the design

to a 3D printer to be made. In a related trend researchers recently manufactured a hamburger in the laboratory in Maastricht⁸, opening up the promise that we are closer to manufacturing or 'printing' food than ever before. 3D printing is but one example of IT-driven manufacturing but one which offers huge opportunities for entrepreneurs, since it lowers to cost of manufacturing and of breaking into supply chains significantly. In fact it highly likely⁹ that sooner rather than later

"Things" will no longer be manufactured and shipped to customers. Instead, you'll purchase designs for everything from glasses to housing, and the input costs of having them printed on site will be cheaper than the current supply-chain process we have today.

While many new firms can be created to exploit this technology manufacturing niche market and other goods, and hence provide new jobs, it is also likely that this new technology-driven manufacturing will also wreak havoc with many existing manufacturing industries. This is the nature of creative destruction, and of the entrepreneurial economy.

(ii) The Entrepreneurial Economy

Entrepreneurs have always played an important part in all cases of successful industrialization, from the case of Britain in the 18th century to China in the 20th. They provide a number of essential 'roles' in industrialization. First, the new firms they create offer new products and introduce new processes, in the process providing information to other entrepreneurs (like many ITC-entrepreneurs who are opening the field of 3D-printing, for instance.

Second they can contribute, if skillful and supported, to grow firms by making use of scale economies. Such larger firms tend to specialize, and the clustering of specialized firms can give rise to localization economies, further encouraging innovation and specialization. Third, by raising the returns to human and physical capital, entrepreneurs provide incentives for further investment and education – which feeds in again into innovation and creativity. If educated people cannot get jobs, investment in education by people themselves will be discouraged, even if governments build schools and train more teachers and improve curricula.

Consider first the informational spillover effects entrepreneurs generate. Early or lead entrants into a market or production process reduce the uncertainty for followers by providing information as to its profitability (Hoff, 1997). It has been described as a 'cost-discovery' function by Hausmann and Rodrik (2003). For Indonesia, an appropriate industrial policy that facilitates this cost-discovery function of entrepreneurs needs to be flexible, and moreover encourage experimentation. According to Aghion (2009:15) the entrepreneurially-consistent and innovative industrial policy needs to be able to facilitate experimental state intervention but must be able to 'stop the intervention if it turns out not to be efficient'. This is where the current industrial policy of the Indonesia may be flawed, in that it has tended to support failing firms or sectors (see Thébault-Weiser, 2008). Just as firm entry to assume new opportunities, to provide higher returns to human capital, and to signal what an economy may be good at producing is important, so firm exit, once a firm has failed, is important. According to Campbell (2009:1), industrial policy will fail when

⁸ See <http://www.theguardian.com/science/2013/aug/05/first-hamburger-lab-grown-meat-press-conference>

⁹ See <http://thenextweb.com/insider/2013/07/21/9-ways-3d-printing-is-going-to-change-the-tech-world/?fromcat=all> (accessed 5 September 2013)

government's lack the strength 'to cut support to unsuccessful companies and industries' which are politically well-connected.

Second, market failures, discussed more thoroughly in the previous section, often prevent firms from growing. The growth in firm size as a country industrializes is a 'stylized fact' of economic development. It depends however crucially on entrepreneurship – specifically entrepreneurial talent or ability as illustrated by Murphy et al. (1991). Market failures result in the mis-allocation of entrepreneurial talent. This may be a serious problem in present-day Indonesia, where there is missing-middle in terms of firm size: a few large conglomerates on the one hand, and millions of small and micro-firms that almost never grow. Building entrepreneurial ability and management capacity hence becomes vital for the industrial success of Indonesia, and should be measured by the extent to which small firms start to grow and the missing-middle disappears.

The role of entrepreneurial ability and management capacity in the industrial success of the East Asian Tigers has been emphasized by Nelson and Pack (1999). They offer a dual economy model to explain the structural transformation of economies such as Korea and Taiwan from being characterized by a 'craft' sector to a 'modern' economy. They assign a key role to the 'effectiveness of entrepreneurship' (or entrepreneurial ability), which they see as a vital determinant of the rate of assimilation of technology (1999:420). They stress the imitative role of entrepreneurship as well as its role in taking on uncertainty, given that the adoption of (mostly) foreign technology by entrepreneurs in these countries entails significant risk-taking (1999:418).

The third role of entrepreneurship inhibited by market failures is that of creating incentives for further investments in human capital formation. Since the process of industrial catching up requires a higher level of skilled labour, entrepreneurs cause an increase in the demand for educated labour. This leads to an overall improvement in human capital in a country, in turn facilitating the imitation and adoption of foreign technology.¹⁰ Nelson and Pack's model (1999) implies that a 'rapid' expansion of skilled labour can only be absorbed if entrepreneurial ability is high, and that without entrepreneurial ability the returns to physical and human capital is low (Nelson and Pack 1999:423). In a knowledge-economy, such as is increasingly impacting on Indonesia, the returns on investments in education such as these generated by entrepreneurs can be high. This confluence of knowledge as production factor and entrepreneurship has been described as the entrepreneurial economy, and is often contrasted with the older 'managerial economy'. One may argue that Indonesia's economy need to make this transition so as to be able to maximize its participation in, and benefiting from the global fragmentation of production.

Thurik (2009) based on earlier work by Audretsch et al (2006,2007) discusses the transition from the managerial economy to the entrepreneurial economy as due to the simultaneous rise in the importance of knowledge and the entrepreneur in production. In his words (Thurik, 2009:4)

...the managed economy is the political, social and economic response to an economy dictated by the forces of large-scale production, reflecting the predominance of the production factors of capital and labour as the sources of competitive advantage. By contrast, the model of the entrepreneurial economy is the political, social and economic response to an economy increasingly dominated by knowledge as the

¹⁰ Keller (2004:752) point out that for most countries, foreign sources of technology account for 90 per cent or more of local productivity growth.

production factor, but also by a different, yet complementary factor that had been overlooked: entrepreneurship.

The simultaneous rise in the importance of knowledge and entrepreneurship is no coincidence. Entrepreneurs are the essential drivers of innovation as Schumpeter recognized, and the 'filters' through which knowledge externalities spill over. Support for entrepreneurship in industrial policy in Indonesia can therefore be part of the formation, function of the six regional clusters (because of their localization of spillovers) and their linkages with the rest of the economy; it can be part of the stimulation of innovation (R&D) and also in the greater provision of venture capital¹¹ support, currently largely lacking in Indonesia. Much research is still however needed to understand entrepreneurship in Indonesia and its promotion through industrial policies, especially in relation to innovation; the World Bank (2011) has stressed that 'the existing literature on R&D in Indonesia is mainly descriptive, enumerating existing resources and institutions and focusing mainly on agricultural R&D'. The challenge of more and better research on entrepreneurship and innovation in Indonesia, and its implementation is a challenge now confronting the Indonesian scholarly community, as well as practitioners, policy makers and their international partners.

Concluding Remarks

More than sixty years ago, Paul Rosenstein-Rodan (1943) called, with reference to Eastern Europe, for government intervention into industrialization to overcome poverty traps and global inequality. Moreover, he argued for industrialization that creates jobs, that is global in that it fits with the international division of labour, and for industrialization that does not take place in autarky. Such structural change is still broadly relevant for the challenges and trends facing a large emerging economy such as Indonesia today. Achieving such structural change within the globalizing world economy, this paper has argued, will require a shift in focus in Indonesia's industrial policy.

It used to be believed that for Indonesia '*Macro policy matters more than industrial policy*' (Lewis, 1994:14). There used to be a 'neoliberal' interpretation of the country's rapid industrialization between 1966 and 1998 that ascribed the country's success to good macro-economic management alone. These interpretations and beliefs have however been shown to be too simplistic, and that the selective industrial policies of the New Order (post 1966) did indeed contribute towards the industrial success. In one interpretation, the industrial policy post-1966 succeeded because it established a coalition between the Indonesian political elites and the Indo-Chinese business community that provided for rent-seeking and corruption to be limited (Rock, 1999: 700).

To say that industrial policy mattered in the past for Indonesia does not imply that the models of the past will apply in the present. The current global economy that Indonesia now finds itself part of is vastly different from the 1966 world. Certainly, macro-economic stability still matters, but the correct industrial policy is just as, if not more important now if Indonesia is to successfully develop and expand its key industrial sectors. Herein innovation and entrepreneurship, to be able to take part in

¹¹ Entrepreneurship education and an improvement in the business climate often stimulates the demand for venture capital, which then becomes for many potentially high-growth and innovative firms a constraint as little has been done policy-wise to raise the supply of venture capital (see also Kortum and Lerner, 2001, and Lerner, 2011, on the importance of venture capital finance for innovative firm-growth).

the global fragmentation of production, was discussed as important considerations for industrial policy.

The concerns against selective industrial policy have always centered on government failure (Aghion, 2009; Harrison and Rodriguez-Clare, 2009). Many are concerned that industrial policy will degenerate 'into an orgy of corruption and detrimental rent-seeking' (Hodler, 2009:85). Indonesian policy makers should not underestimate this danger. However, as others including Cimoli et al (2006:17) have pointed out, rent-seeking and corruption may not be inevitable. They mention for instance linking protection to productivity gains (as for instance the linking of protection to export performance in the case of South Korea) and increasing domestic competition through facilitating firm entry and exit. Moreover, Bayliss and Cramer (2001) argues that the *absence* of a clear and unambiguous industrial policy can be dangerous, as

'naïve privatization analysis and programme design may well encourage incoherent protection. Without a policy framework or rationale for selecting the beneficiaries of protection...it is more likely that weak developing-country states will cave in haphazardly to pressure'. (ibid, p. 61)

Whether Indonesia ultimately can avoid industrial policy to be weakened by rent-seeking therefore depends on the (evolving) political context (see also Robinson, 2009; Holder, 2009). If the political context can result in the political will and bureaucratic integrity to see through a set of industrial policies that will establish incentives for entrepreneurial entry, increase competition, incentivize technological upgrading and transfer, and avoid propping-up inefficient firms, then there is little to hold the country back from a second period of industrialization.

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