

# Strategic Industrial Policy and Business Environment Reform:

## Are they Compatible?



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## **Executive Summary**

The importance of Business Environment Reform (BER) has been a key theme of the donor community for many years. However, industrial policy (IP) is back on the policy agenda of many countries with concerns over national competitiveness in a globalized world, and this Report addresses the compatibility of BER and IP approaches. More recent discussions of IP have been based around the work of the Harvard economists Dani Rodrik and Ricardo Hausmann. The authors have built on the standard argument from micro economics that where markets fail to meet the restrictive conditions of the model of perfect competition there is a theoretical case for government intervention. The role of policy is therefore not just to correct for market failure in a static sense, but critically to encourage the innovation that will foster long-term productivity growth. The process side of this new version of IP is important and the private sector is to be engaged not just through a regular dialogue, but also through contests through which consortia of firms – for example, organized by business associations – can bid for government support through the provision of public goods.

As yet, few governments have adopted the full range of recommendations from this newer literature, but there are many examples of past and current government interventions both horizontally (non-selectively) and vertically (selectively). A review of four country cases suggests IP has been successful with

- A committed government with a long-run vision on diversification and innovation and policy continuity in the operation of incentives
- A willingness to support new dynamic activities with fiscal and other incentives
- An awareness of the need to attract foreign investment and foreign technology to develop new activities
- A willingness to offer a range of incentives, often as firm-specific packages
- An outward-looking rather than inward-looking trade policy which exposes recipient firms to competition in export markets.

BER and strategic IP have in common a focus on a dialogue with the private sector. Also, horizontal IP measures are designed to correct for market failures and are thus compatible with the ‘level playing field approach’ of BER. It is where vertical (selective) measures are used in IP that the potential for contradiction is greatest. Differences can be minimized by focusing on a limited number of priority areas where an economy has a latent comparative advantage that can be turned into an actual competitiveness with relatively modest and short-lived support. The Appendix sets out a detailed methodology for identifying priorities that can build on existing comparative advantage.

The capabilities required to implement IP are often very similar to those for BER. IP requires a public bureaucracy which has the capacity for independent initiative, where promotion and placement is on merit and where remuneration is high enough to retain high standard staff. The operating principles that governments need to strive to apply cover transparency, credibility, reciprocity and trust.

Recommendations to donors wishing to apply IP include

- Establishment of an institutional framework based on an over-arching competitiveness or deliberation council with high level political representation and supported by subcouncils that address specific issues on a sectoral or cross-sectoral level.
- Support for business associations.
- A series of policy initiatives such as a fund to provide public inputs needed for new activities, a fund for feasibility studies, tax incentives for new activities, risk capital funds either through venture capital or a development bank for new high-risk activities and a process of sector reviews to identify bottlenecks in new sectors.
- Creation of regular industrial policy reports for individual countries.
- Establishment of a regular monitoring process.

## **1. Introduction**

The importance of Business Environment Reform (BER) has been a key theme of the donor community for many years. The DCED (2008:2) defines the business environment as ‘a complex of policy, legal and institutional and regulatory conditions that govern business activities’. The rationale of BER is to ‘promote the development of markets that encourage competition and enhance the effectiveness and sustainability of other development interventions’. BER is based on the premise that in many developing countries, the development of markets is constrained by factors like excessive and inappropriate regulation and a weak legal system, and that this has had serious negative consequences for private sector investments and economic growth. The Business Environment (BE) is a subset of the broader investment climate which was defined in World Bank (2005: 2) as ‘the many location specific factors that shape the investment opportunities and incentives for firms to invest productively, create jobs and expand.’ The investment climate also covers broader issues like the quality of infrastructure, the skills base, the difficulty of accessing sources of finance and aspects of the labour market, which are often critical in low income economies.

Whilst BER is seen by donors as a key to unlocking the potential of the private sector, there is a growing view in both academic and policy circles that additional supply-side initiatives both to improve the investment climate more generally and to alter the structure of developing economies will also be important to stimulate growth. Such additional measures have been described as ‘industrial policy’ (IP), although this term can be interpreted in various ways.

This Report examines the complementarity and divergence in approach and instruments between BER and IP and gives recommendations on how synergies can be found and built into donor policies for private sector development. It defines IP broadly as a set of interventions designed to overcome failures in markets with a view to altering the structure of production towards higher productivity, dynamic activities. Failures in markets are broadly defined to include an inability to shift adequate resources to activities with long-run potential. These interventions can be aimed at any activity, not just the manufacturing industry, and can likewise be aimed at different stages in the value chain, not just that of production operations.

While BER focuses on reducing the costs and risks of doing business and levelling the playing field for economic agents, IP focuses on overcoming gaps or failures in markets and in its more ambitious versions to anticipate and at times override the signals which a market may generate.

The Report begins with a discussion of two versions of IP and considers how far IP has been used in recent years by both donors and governments. The third chapter considers both the

compatibility and incompatibility of BER and the newer strategic IP approaches. The fourth chapter moves from this conceptual discussion to an analysis of country examples, citing the cases of Singapore, Ireland, Malaysia and Chile, while the fifth considers the country capabilities required for the successful application of IP, and whether these differ from those required for BER. The final chapter proposes a series of recommendations to donors on the application of IP.

## **2. Trends and debates in industrial policy**

This chapter examines two versions of IP – both an historical one broadly corresponding to past practice, and a newer strategic version as set out in recent academic literature. It then considers both donor and government response to this recent literature and how far IP should be used to address a range of objectives.

To illustrate the potential scope of IP it may be helpful to first set out some simple concepts. In terms of policy measures, a schematic 2 by 2 matrix is useful for clarifying the concepts. Interventions can be either through the provision of public inputs – like physical or social infrastructure – or through market-based incentives – subsidies, tax holidays, funding or import protection.<sup>1</sup> Similarly, they can be available to all who meet the specified criteria regardless of subsector – horizontal incentives – or only to specified subsectors – vertical incentives.<sup>2</sup> Table 1 presents this approach to classification with examples of the different policies.

### **2.1 Two versions of industrial policy**

Industrial policy is back on the policy agenda of many countries with concerns over national competitiveness in a globalized world. In academic circles, debates on the role of IP never ceased, despite the prevailing policy consensus from the 1980s onwards regarding the need for a dominant role for markets in determining resource allocation.

Two separate strands in the literature on IP in a development context can be distinguished, since they imply distinct interpretations of how such a policy might be implemented. First, there is what we can term an historical tradition. This draws on experience from today's rich countries where 'infant industry' protection was used in the nineteenth century to create new industries in 'latecomer' or follower countries, such as the US and Germany, as well as the twentieth century examples of state intervention to foster industrial development, starting with Japan and followed by, most notably, the Republic of Korea and China, Taiwan

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<sup>1</sup> Here we define a public input as a good that the private sector would not produce to an adequate level, for example, due to non-excludability of users or due to an inability to capture an external benefit in the price charged.

<sup>2</sup> Horizontal incentives are sometimes referred to as 'functional' and vertical incentives as 'selective'. The horizontal/vertical and public input/market distinction has been frequently used in discussions on policy in Latin America.



Province, but also by other countries in East Asia.<sup>3</sup> These policies were predominantly geared at supporting industrialization as a means of raising productivity levels and rates of economic growth and, hence, IP in this sense implies a bias towards industrialization.

**Table 1 Classification of policy interventions**

	<b>Horizontal</b>	<b>Vertical</b>
<b>Public inputs</b>	Broad-based skills training	Sector-specific skills training
	Infrastructure investment and regulatory reform	Targeted infrastructure investment
	Banking sector regulatory reform	Business plans for selected sectors
	Standard setting bodies	Selective business services
<b>Market-based provision</b>	Corporation tax reform	Specific tax holidays
	General labour subsidy	Sector-specific labour subsidy
	Export promotion – credit availability, duty drawbacks, tax treatment	Sector-specific export promotion
	Export processing zones	Selective import protection
	General venture capital funding	Sector-specific venture capital funding
	General credit guarantees for SMEs	Selective credit guarantees
	Subsidized credit to all SMEs	Directed credit
	Tax incentives for R and D	Selective R and D incentives
		Price support schemes

The impact of the policies pursued in these country cases has been the subject of very extensive debate, but many believe that despite the empirical difficulty of establishing this case in detail, state intervention did help transform the structure of the economies concerned and allowed the emergence of a globally competitive industrial sector. The types of policies pursued varied but focused principally on developing specific subsectors or branches of industry with the potential for both high levels of productivity relative to the given economy's average and for high rates of productivity growth. Trade policy at this time was relatively protectionist, with periods of import protection combined with export promotion measures. Trade liberalization generally followed rather than preceded the emergence of competitive activities. IP was state-driven with key government bodies like the Ministry of International Trade and Industry in Japan and the Economic Planning Board in Republic of Korea setting the agenda in terms of priority areas. However, there was extensive interaction with the private sector, for example, through industry associations and deliberation councils, an active

<sup>3</sup> Examples of this tradition include Chang (2002), Amsden (1989, 2001), Wade (1990) and Johnson (1982).

dialogue on the implications of policy for producers and at times the setting of quantitative targets for private firms. Significantly, IP was defined in terms of interventions to shift the allocation of resources in favour of the manufacturing sector and within manufacturing towards high productivity, dynamic subsectors.<sup>4</sup>

The more recent discussion of ‘strategic industrial policy’ has largely emerged from the work of the Harvard economists Dani Rodrik and Ricardo Hausmann.<sup>5</sup> The authors have built on the standard argument from micro economics that where markets fail to meet the restrictive conditions of the model of perfect competition (due to lack of information, monopoly, external effects and so forth) or where markets are incomplete or missing (so there are goods which can only be supplied by a public provider), there is a theoretical case for government intervention. However, they have built on the important insight that the driver of development is innovation, and thus it is important to do things in different ways and to create new products (or products new to an economy). The role of policy is therefore not just to correct for market failure in a static sense, but critically to encourage the innovation that will foster long-term productivity growth. In their interpretation, IP is an intervention that alters the allocation of resources towards new, dynamic activities in any sector of the economy, not just in industry. Thus, despite its name under their definition, IP can promote services or agriculture, for example, as well as the manufacturing industry. Their focus is on types of activity – new and dynamic – rather than sectors or subsectors. Hence, the manufacturing industry is not given priority despite the fact that Rodrik himself has provided empirical evidence in support of the thesis that the manufacturing industry plays a special role in the process of economic growth due to its potential for productivity increases.<sup>6</sup>

The focus of strategic IP is also on process rather than on either the branches or subsectors to be promoted or the policy instruments to be used (whether subsidies, tax concessions, import tariff protection, credit allocations and so forth). This is because the dialogue between the government and the relevant private sector stakeholders is meant to identify areas for growth as well as obstacles to this growth, which the government can intervene to remove. Strategic policy is intended for an open trading world, so unlike the historical version, trade protection is unlikely to figure prominently in the policy instruments applied. It does allow for the

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<sup>4</sup> Y.Ojimi, the ex-Vice Minister for International Trade and Industry, in a speech before the OECD Industry Committee rationalized the approach as follows: ‘MITI *decided to establish in Japan industries which require intensive employment of capital and technology, industries that in consideration of comparative costs of production should be most inappropriate for Japan...But from a long-range viewpoint these are precisely those industries where income elasticity of demand is high, technological progress is rapid and labour productivity rises fast (emphasis added)*’ (OECD 1972:15).

<sup>5</sup> See, for example, Rodrik (2007) and Hausmann et al. (2008).

<sup>6</sup> See Rodrik (2007) and McMillan and Rodrik (2011). The argument that manufacturing has a special role in growth is summarized in Weiss (2011). In two papers (Hausmann and Rodrik 2005, Hausmann et al. 2008), the authors restrict the attention of strategic IP to internationally tradable goods; a justification for this focus might be that productivity growth tends to be higher in traded as compared with non-traded sectors.

possibility of short-term temporary support for learning and innovation, but following the precepts of micro economic theory sees import protection as a relatively inefficient means of providing such support. Further, the more ambitious version of strategic policy leaves open the possibility that it will be the government that selects new activities through either a development bank or a venture capital fund on which to place a strategic bet and these bets may be on broadly defined subsectors.<sup>7</sup>

The question of how far governments should take the initiative in driving the direction of change is an ambiguity that is central to strategic IP. Two stylized versions can be identified, with actual practice likely to be a combination of the two. The full model envisaged by strategic policy can apply to the first version. There is a regular and effective dialogue with the private sector and the government plays the role of promoting competition, reducing transaction costs and facilitating private sector innovation. In this version, the government invests in infrastructure, promotes risk taking through strategic bets of public venture capital or development bank lending and arranges contests whereby the private sector can bid for public resources. It may promote FDI in selected areas or technologies through fiscal incentives and an attractive investment climate. This requires an effective public sector bureaucracy and a dynamic private sector capable of responding to the opportunities offered by industrial policy.

The second version is closer to the older historical tradition in that it is public sector-driven with the government identifying subsectors or technologies it wishes to promote, whilst engaging in a dialogue with the private sector on how best to do this. Expert advice through commissioned consultancy studies may be required to complement the evidence provided by the private sector itself. Key here will be identification of the major constraints to growth in strategic subsectors and the devising of policy interventions to overcome these. Both versions run the risk of government failure whereby interventions are ‘captured’ by private interests, and how far either is appropriate will depend on the government’s capacity and the dynamism of the private sector.

## **2.2 Donor responses**

The recent interest in strategic IP within the donor community contradicts conventional thinking, which has focused on a market-based approach to development with the objective of removing obstacles to doing business and the goal of creating a ‘level playing field’ to allow the more efficient producers to expand relative to the less efficient ones. However, at the same time, pursuing BER donors have used a range of interventions designed to support the

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<sup>7</sup> For example, Hausmann et al. (2008: 11) admit that development banks may need to be ‘instruments of strategic bets.. as sources of ideas about high return activities... as the relevant actors will not come knocking on your door.’

supply-side of recipient economies. These include policies on technology and innovation, support for the creation and improvement of value chains and clusters, small and medium enterprise credit and technical advisory services and support for investment promotion agencies.<sup>8</sup> Whilst generally less comprehensive in scope than IP, these initiatives share some of the underlying philosophy. The main difference between these initiatives and strategic IP is that the latter, in principle, aims to provide a comprehensive framework for competitiveness, which emerges from high level deliberations between public and private stakeholders, rather than relying on a partial focus on individual clusters and value chain groups or on a technology policy, which is divorced from other supply-side support measures.

At the level of ideas, some of the arguments justifying strategic IP have been stressed in recent World Bank publications. Its Chief Economist (until mid-2012), Justin Lin, is interested in issues relating to support for industry and has been strongly influenced by East Asia's experience. In particular, he has drawn on the fact that industries have moved between economies in the region in response principally to wage differentials; hence, with rising wages in Japan in the 1980s, firms migrated to lower wage locations like Thailand and Indonesia, and more recently, to China and Viet Nam. This pattern of migration (the so-called 'flying geese' model) lies behind his suggestion that when developing countries start thinking about new subsectors in which to invest, they should start by considering subsectors in which countries with a current income per capita about double their own and a similar resource endowment have been exporting for the past 20 years. This is on the grounds that income per capita provides a proxy for skill sets available in an economy, and incomes more than double those of a country imply a currently unattainable skill set. Once a list is identified, Lin recommends a similar approach to that set out in strategic IP of identifying obstacles to expansion by existing firms or barriers to entry by new firms.<sup>9</sup>

In this context, the debate between Lin and H-J. Chang (Development Policy Review, 2009) provides helpful insights into alternative visions on technological upgrading and structural transformation in industrializing economies. While both agree on the need for government support, they disagree on how far and how fast countries should move, for example, into 'distant' products in the sense of goods that are far removed from current comparative advantage. Lin writes of the importance of a facilitating state that supports innovation and corrects for short-term market failures, but which will not make the mistake of pursuing activities that require skills and capabilities that the economy does not yet possess – what he

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<sup>8</sup> Perez and Primi (2009), for example, provide a taxonomy of IP interventions linked with technology and innovation.

<sup>9</sup> See Lin and Monga (2010: 17-18); as an illustration of the argument, for example, in the 1960s, Japan's income per capita was about 40 percent of that of the US when it started engaging in automobile exports, a sub-sector the US had previously dominated. However, these views remain controversial amongst World Bank economists. See the debate on the World Bank weblog (25 May 25 2012) between Lin and others on how far government intervention in India helped the Indian software sector.

terms *comparative advantage defying* policies. Chang, on the other hand, argues for the importance of policies that aim to transform production structures in an economy by sharing risks and funding between the public and private sector, with the government selectively channelling support to subsectors with the greatest perceived potential. The significance of this debate for the present discussion is that drawing on different readings of historical experience in Asia and economic theory, both authors construct a case for differential incentives between activities. They differ principally over how far countries should try to depart from their existing specialization and how far they should aim to move into products that require significantly new skill sets.

This research interest has been matched by operational work in that the World Bank has started to address obstacles to industrial development. A recent study on light manufacturing in Africa looks at the constraints to development in a range of subsectors in several East African countries (World Bank, 2012). This focus on constraints can be interpreted as ‘industrial policy in the small’ in the terminology of Rodrik-Hausmann, however, it is noteworthy that the constraints emerge from external expert reviews commissioned as part of the study. Data was collected from many firms both through qualitative interviews and quantitative questionnaires, but ideas for reform did not emerge from an ongoing dialogue with the private sector as recommended in strategic IP. Similarly, unlike the Rodrik-Hausmann recommendations, the focus is on subsectors like clothing, leather goods and furniture rather than on cross-sector activities, like innovation, training or product development. Hence, the approach retains some of the features of what we have termed historical IP rather than the new strategic variant.

As part of the increased interest amongst donors in exploring ways of addressing constraints to growth, suggestions have been made relating to a broadening of the objectives behind any IP interventions. The original rationale for IP lay in upgrading the production structure to raise productivity levels and thus overall economic growth, and the academic statement of strategic IP retains this focus on innovation and productivity improvement. However, some recent donor analyses have argued for the need to widen the goal of IP to incorporate an economic, social and environmental dimension with, for example, indicators compiled for the impact of interventions on the labour market (number and type of jobs created), on poverty (estimates of numbers of people lifted out of poverty), and on the environment (GHG emissions, energy intensity).<sup>10</sup>

One can, of course, widen the scope of IP and leave policymakers to decide on trade-offs between objectives, although there is a risk of inconsistent decisions in relation to different

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<sup>10</sup> UNCTAD-UNIDO (2011: 39-40) in its analysis of the scope for IP in Africa suggests that each of these dimensions should be incorporated in an assessment of the attractiveness of new activities.

projects or programmes. The old ‘development banking model’, in which state banks funded projects with a mixture of commercial and developmental objectives, was widely criticized for creating inefficient and unsustainable projects that burdened these banks with high rates of non-performing loans. If the goal of IP is to support a dynamic private sector, widening the scope to include poverty and social objectives might entail a risk that it will create contradictions and difficulties in decision-taking.<sup>11</sup>

Linking IP with environmental sustainability has become common (Naude, 2011). To avoid the danger in seeing IP as an all-purpose set of measures that tries to meet conflicting objectives, arguably it is preferable not to confuse environmental and industrial policy, but rather to apply IP within a clear environmental policy framework which sets out environmental goals and instruments to achieve these. Applying IP within this framework is appropriate for meeting clearly defined objectives.

For example, one goal of many countries currently is to increase the share of renewable energy in the portfolio of energy companies, with this seen as a key plank of plans for greenhouse gas reductions. If this is set as a national environmental goal, IP can be used to support it in a variety of ways. Governments can offer loans or loan guarantees to finance renewable energy generation and transmission projects, guarantee their access to the national grid and offer preferential ‘feed-in’ tariffs for sales of renewably generated energy. They can also support research into and the commercialization of clean technologies and economic activities that embody these. This can be based around a number of measures, including cash grants and tax incentives for foreign investors and local firms undertaking R and D in ‘green technology’, the creation of low carbon clusters of firms in special ‘Green Zones’ and a Green Development Bank to fund only environmentally friendly start-ups. These are all familiar policy instruments which can combine elements of an horizontal approach – all clean technology firms, for example, may be eligible for a tax credit with a vertical dimension – only certain subsectors will have firms for which this incentive is valid.<sup>12</sup>

### **2.3 How far have these ideas been taken up by governments?**

Formal IP was unpopular with most governments during the period from the early 1980s to relatively recently, in part because it was associated with what were widely perceived to be failed policies of import substitution industrialization behind relatively high barriers to

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<sup>11</sup> In theory, it is possible to conduct a cost-benefit analysis of different projects, which captures the trade-off between growth, distributional and environmental impacts to create a single measure of a project’s worth. This, however, requires an agreed set of weights for the comparison between different impacts and in practice, this type of calculation is rarely, if ever, carried out.

<sup>12</sup> Global instruments like the Clean Development Mechanism are an international form of IP intervention designed to allow firms in developed countries to acquire credits for GHG emission reductions resulting from climate mitigation projects they finance in developing countries, although current estimates suggest its impact has been smaller than anticipated; see UNCTAD (2010: 102).

imports. Nonetheless, during this period, whilst it was not described as IP, the majority of governments continued to intervene in markets, often in ways that affected the economy in a highly selective manner. These forms of intervention occurred in the context of an open foreign trade and investment policy, often involving Special Economic Zones and incentives to foreign investors, as well as differential credit and tax policies for domestic investors. In more recent years, these interventions have been described as ‘competitiveness policy’ instead of IP, and many countries have published programmes to raise competitiveness, usually focusing on incentives for R&D and innovation.

For example, in a high income context, a recent communiqué from the European Commission on an ‘Integrated Industrial Policy for the Globalisation Era’ talks of the need for ongoing structural reform in the member states based around improvements to the business environment, modernization of public administration, support for innovation and improvements in energy efficiency.<sup>13</sup> The need to have a tailor-made approach to different sectors to overcome market failures and funding gaps and encourage innovation is also emphasized. The development and marketing of ‘key enabling technologies’ in fields like biotechnology, nanotechnology, advanced materials and photonics is highlighted as critical in the development of new processes and goods.

For Latin America and the Caribbean, Peres (2006) surveys the competitiveness policies employed from the early 1980s to around 2005, a time when IP itself was not an accepted policy topic. He reports that in seven countries, public sector development banks carried out lending practices oriented towards specific targeted sectors and offered fiscal incentives differentiated by sector in 18 countries. Of note, however, is the fact that most countries did not prioritize manufacturing, instead favouring parts of agriculture, tourism and various forms of services. He also reports that there were several instances of active engagement of the private sector in pushing for policy reform through their industry associations, so the various measures applied were not necessarily government-driven. More recently, the Brazilian industrial policy launched in 2008 included 7 programmes targeted at leading sectors (aeronautics, oil, natural gas and petrochemicals, bio-ethanol, mining, steel, pulp and paper and meat) with credit supplied by the key development bank (BNDES) (Perez and Primi, 2009).

In a survey of seven low and lower-middle income countries in Africa and Asia, Altenburg (2011:71-72) identifies the relatively frequent use of IP, often on a selective basis. Modest success is identified for investments that built on existing specialisms – for example,

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<sup>13</sup> See European Commission (2010: 12-14). As part of its monitoring of policy effectiveness, the Commission compiles country indicators on productivity and costs relative to global competitors, jobs in industry and industry-related services, manufacturing output growth, particularly in eco-industries and the share of medium- and high-technology activity in manufacturing value-added.

Tunisia's garments exports to the EU, Viet Nam's exports of coffee, fish and shrimps, Ethiopia's cut flower industry and Namibia's move into the export of inputs for cosmetics and pharmaceuticals. In these cases, most of the policy initiatives appeared to be top-down from government bodies rather than through the type of participatory dialogue envisaged in the new strategic policy. Whilst all of the governments had consultative processes for engaging with the private sector, these were largely deemed ineffective, with the main business associations in some instances controlled by governments.<sup>14</sup> Significantly, in the context of the application of the ideas of strategic IP, little evidence of encouragement is found here for a search for new products and processes.

The original authors of strategic IP have been used as consultants in a number of countries, including, amongst others, South Africa, Colombia and El Salvador. For South Africa, they produced a paper which made very explicit suggestions as to how their ideas might be incorporated in the bureaucratic structure and implemented in practice, including the creation of a special fund to finance public inputs on the basis of proposals from the private sector, and the conversion of the existing Industrial Development Corporation into a risk-taking venture capital fund (Hausmann et al., 2008). South Africa introduced a new industrial policy in 2010, but the focus remains on subsectors to be developed rather than on cross-sector activities via public inputs.<sup>15</sup>

More evidence of the influence of the ideas of strategic policy can be found in Colombia. A high level national competitiveness commission composed of senior public and private sector members was created in 2007 and a private sector equivalent was also established the same year, with Ricardo Hausmann as its main adviser. To develop a national competitiveness strategy potential, new export growth sectors were identified and bids for support were invited from the private sector through their industry associations based on detailed business plans. Subsequently, this was matched by requests for innovative bids from mature export sectors. The government would fund 50 percent of the cost of the best bids. The plans included in the successful bids formed the basis of industry programmes of 'productive transformation' which was launched in 2008. The government stressed the difference between this approach operating through the private sector via industry associations and historical IP as practiced in Latin America, since the new policy was based on competitive bidding from the private sector and involved no tariff, tax concessions or subsidies, but rather an upfront

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<sup>14</sup> Ethiopia, Viet Nam and Syria are cited as examples in Altenburg (2011:66). However, Ethiopia's success in the cut flower industry is attributed to a private sector initiative to which the government responded positively with favourable tax treatment, low cost access to land and the creation of the establishment of a National Horticulture Development Agency.

<sup>15</sup> As a symptom of the difficulty of creating an effective participatory approach to policymaking, the apex organization in South Africa designed to bring together the government, business community and organized labour – the National Economic Development and Labour Council – has been judged to have failed to create a consensus around key policies; see te Velde and Leftwich (2010:7).



commitment by the state to provide various public inputs in support of the subsectors concerned (Melendez and Perry, 2010). However, other aspects of IP in Colombia less obviously followed the precepts of strategic policy with, it is suggested, continued differential support to firms unrelated to any discernible economic rationale and largely driven by cronyism, particularly through profits tax concessions.

The work of Fundacion Chile whose mandate has been to introduce technologies new to Chile is frequently cited by Rodrik-Hausmann, principally in relation to the successful development of salmon farming in Chile utilizing Norwegian technology. This provides a clear illustration of a successful strategic bet on a new activity and an example of a successful venture capital initiative of the type central to strategic IP. However, even in this case the role of Fundacion Chile in the overall economy remains modest due to its very limited capital resources with a recent review concluding that it has not been able to undertake many risky innovative ventures due to lack of state funding (Agosin et al., 2010).

In the African context, one of the initiatives closest to the ideas of the new strategic policy is the creation of Presidential Investor's Advisory Councils in several countries. These are small groupings comprising key business leaders and senior ministers and are chaired by the President. They operate with a secretariat and a range of subcommittees that focus on issues of policy arising from the core meetings. As yet it is unclear how effective these have been, but the underlying idea is clearly linked to the participatory approach of strategic policy (Boardman, 2007).

Some governments have elaborated plans and institutional frameworks that on paper look very similar to recommendations from the recent literature. For example, as discussed in UNIDO (2011), the Government of Mongolia created a comprehensive National Development Strategy 2008-15 which talks of using mineral wealth to diversify the economy, support for innovation, the need for reform of the investment climate and for a regular dialogue with the private sector. The government sees its role as creating a favourable business environment, ensuring a sound and reliable financial system and reducing bureaucratic obstacles to doing business. The development of an export-oriented, private sector-led, high-technology-driven manufacturing sector, funded from the proceeds of mineral exploitation through a Mongolia Development Fund, is a key priority.

Hence, whilst there are many examples internationally of governments intervening to support individual sectors or subsectors through industrial or competitiveness policies, there are relatively few examples of interventions that correspond precisely to the recommendations of the newer strategic industrial policy in terms of its focus on dialogue and participation and its emphasis on activities rather than sectors. This is despite its theoretical basis in the

established precepts of micro economics and the influence of key authors both as academics and advisers. Although the literature is relatively recent, why these ideas have not yet led to major shifts in policy is no doubt in part due to the difficulty of establishing the type of detailed and participatory dialogue with representatives of the private sector envisaged in the original literature. If strategic IP is to be pursued, donors clearly have a role in encouraging and supporting such a dialogue.

### **3. Compatibility of business environment reform and strategic industrial policy**

This chapter considers the compatibility of these approaches by looking at their objectives and potential areas of conflict. It distinguishes between horizontal (available to all) and vertical (selective) IP measures and how far the latter aim to change an economy's comparative advantage.

#### **3.1 Common ground through dialogue**

The stated goals of BER (DCED 2008: 4) are:

- To reduce the costs of doing business
- To minimize the risk attached to new investments
- To increase competition as a stimulus to productivity improvements.

In principle, IP aims to achieve each of the goals attributed to BER. Transaction costs and risk are to be reduced by providing infrastructure and public goods important to the private sector and by listening to the views of producers as a means of identifying constraints to growth. Competition is to be increased by encouraging the development of private sector activities that can operate competitively in national and international markets after a learning period.<sup>16</sup> Investment climate surveys are critical to both. They provide an important insight into how producers perceive their operating environment and as such are a central element of BER. Similarly, the data collected from investment climate surveys provides an important part of the information needed to consider the key constraints on expansion and are thus an important starting point for a dialogue with the private sector as part of IP. More generally, there should be a demonstrable link between data collected as part of the analysis of the investment climate and IP recommendations and such surveys can be considered a pre-requisite for effective IP.<sup>17</sup>

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<sup>16</sup> Lin and Monga (2011: 304) in a restatement of their approach argue that 'By facilitating co-ordination and addressing externality issues, industrial policy helps many domestic and foreign firms to enter sectors that are consistent with the country's latent comparative advantage and turn them into overt comparative advantages, *and thereby intensifies competition within the industries* and enhances the economy's competitiveness' (emphasis added).

<sup>17</sup> For example, in its discussion of industrial policy options for Mongolia, UNIDO (2011:35-37) draws on the results of investment climate surveys. The most recent survey revealed that firms in Mongolia face heavy transport costs, that they wait longer than firms elsewhere in the same region to obtain licences and that it takes three times

The expanded public-private dialogue envisaged by strategic IP offers an opportunity to end the distinction between favoured and disfavoured firms that has been revealed in recent enterprise surveys –whereby favoured firms find ways around controls and regulations – and to reduce policy uncertainty. This will require the private sector side of the dialogue to genuinely be representative and for the public sector side to not be ‘captured’ by the favoured parties. Since both the impact of business restrictions and the nature of constraints on the investment climate can vary between subsectors and firm size, it is important to conduct public-private dialogue at a sufficiently micro level to allow real barriers and constraints to be identified.<sup>18</sup> Further, in economies with a relatively weak private sector, insofar as IP succeeds in supporting and developing a private sector it will over time create a constituency for further BER.<sup>19</sup> Thus, if in future the dialogue aspect of IP can help organize the private sector and facilitate its discussions with government, a route for complementarity with BER is opened.

### **3.2 Horizontal measures and market correction**

Conceptually, horizontal IP interventions have strong complementarities with BER. The latter aims to reduce or remove, as much as is practical or desirable, barriers to the free functioning of markets, whether they be price controls, minimum wage legislation, restrictive regulations, administrative delays or lack of legal protection for property rights. The theoretical model behind these ideas implies that if markets are decontrolled, this will create a level playing field and allow the more efficient private firms to expand relative to the less efficient ones. This widely held ‘practical’ view was always a major simplification of economic theory, since in reality markets almost always fail to meet the restrictive conditions necessary to ensure that when decontrolled they will inevitably produce the best possible outcome in terms of efficiency (and even less so in terms of income distribution).

Horizontal IP interventions have the same goal as regulatory and legal reforms, as they are designed to make markets work more effectively by compensating for ‘market failures’ such as lack of information and external effects, or by removing monopoly or monopsony structures. They offer incentives or public goods equally to all firms with the intention of

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as long for exports to clear customs than the global average. Such information which is standard to this type of survey is clearly relevant for understanding the constraints faced by firms and is complementary to IP interventions. Similarly, the Government of Mongolia takes its ranking in the Doing Business database very seriously and aimed to be one of the top-10 destinations in Asia for doing business by 2012.

<sup>18</sup> Recent, analyses of World Bank enterprise survey data have explored the link between BER and firm performance; see, for example, Alterido et al. (2009), Djankov (2009) and Klapper and Love (2010). Hallward-Driemeier and Pritchett (2011: 31-2) use this data to show that the business environment is often far from a level playing field and that there are important distinctions between favoured and disfavoured firms and that uncertainty over how far nominal controls will be implemented is an important factor, particularly in Africa.

<sup>19</sup> Empirical evidence of the link between the type of public sector-private sector dialogue and interaction envisaged in the strategic IP literature and BER is provided by te Velde (2006) who creates an index to measure the degree of what he terms ‘state-business relations’. A high score of the index – implying close contact – is associated with an improvement in some of the standard indicators of the business environment.

improving the functioning of markets. Their rationale is thus directly complementary to the logic behind BER. For example:

- Publicly funded skills training is designed to compensate for the fact that firms acting independently will under-invest because newly trained workers can leave and take their skills elsewhere, creating an external benefit for competitors.
- Regulatory reform in the power sector is usually designed to create a quasi-competitive market to avoid the creation of a monopoly position.<sup>20</sup>
- Funding for venture capital initiatives and R and D can be rationalized as a compensation for the external benefit created by innovation as followers can learn and copy from the example of innovators.
- Credit guarantees are a form of market correction to avoid a coordination failure in the credit market in that they compensate for the lack of information on the potential returns to investment by small borrowers. A government guarantee allows commercial banks to avoid the problem of adverse selection – where only risky projects are put forward at high interest rates – and by lowering the overall risk level of their portfolio which allows them to hold lower reserves.
- General labour subsidies – for example, through reduced social security payments or tax liability - can be rationalized as a compensation for labour markets that fail to reduce under-employment due to structural frictions and which thereby allow wages to exceed the opportunity cost of labour.<sup>21</sup>

Micro economic theory justifies such market corrections with the qualification that the interventions used should not themselves create too many undesirable side effects (technically ‘by-product distortions’). To avoid this, the standard recommendation is that any intervention should be aimed as directly as possible at the market failure. Hence, if the intervention is to compensate for the demonstration effect of R and D, for example, the argument is that the innovator should be subsidized directly (for example, through a cash grant or a tax allowance for R and D expenditure) rather than indirectly through import tariff protection which raises costs to consumers and encourages investment in general but not specifically in R and D.<sup>22</sup> Similarly, if the problem in the credit market is lack of collateral, the most direct solution might be a government guarantee, leaving banks free to decide where to allocate their funds rather than a directed credit instruction from the government on who to lend to.

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<sup>20</sup> The overlap in this case is so great that it is possible to classify regulatory reform under either industrial policy or the business environment.

<sup>21</sup> Note this is a separate argument from the case for labour subsidies based on the social effects of job creation.

<sup>22</sup> This was termed a ‘policy hierarchy’ approach with the best policy the one that minimized by-product or side effects; see Corden (1974). In discussing the case for investment climate reform, the World Bank (2005: 162-3) cautions against selective or vertical interventions, whilst noting that they may work in theory. If such interventions are to be used, the World Bank suggests to ‘match the instrument to the rationale’, which is a restatement of the policy hierarchy approach.

Horizontal measures are by definition open to all producers and households who wish to take advantage of them. However, ex post there is no such thing as genuinely horizontal measures, since any measure will in practice impact differentially depending on the nature of firms or activities. Investment in road or power improvements, for example, will have a different impact on firms depending on the importance of transport and energy in their cost structure. Even general as opposed to skill-specific labour training will benefit labour-intensive firms disproportionately and conversely, tax credits related to depreciation allowance will benefit capital-intensive firms. Special support for SMEs differentiates by scale of production and employment and EPZs and other export promotion schemes benefit exporters as opposed to domestically oriented firms. Thus, perfect neutrality of outcome is impossible, even if all IP is based ex ante on neutral, horizontal interventions. In principle, horizontal measures supporting innovation, available to all but with an in-built element of selectivity in that they offer benefits disproportionately to the most dynamic firms, offer the greatest scope for compatibility between BER and the strategic IP approach.

### **3.3 Vertical measures and anticipating the market**

Whilst it is not difficult to find examples of horizontal measures that are perfectly compatible with the theory underlying BER, the case of vertical or selective measures is clearly more controversial, because these *aim to alter market incentives and to anticipate future market development rather than compensate for the imperfections in the current market environment*. Micro economic theory provides a rationale for differentiated vertical measures based on the propositions that:

- Externalities in both a positive or negative sense will vary as a proportion of a firms' sales revenue.
- Coordination failure as an example of an externality – where activity by one firm is needed to stimulate activity by others – will be more important in some sectors or value chains than in others.
- The potential for productivity growth and the learning period in terms of technology mastery will vary between technologies and thus between activities.
- The capacity to generate future productivity growth and technical change will also vary between firms using the same technology.

Each proposition implies that, as in theory there is no reason to expect uniformity between types of activity or firms, there is a case for a selective intervention that has a non-uniform impact on revenue. The convincing objection to this is on practical grounds in terms of the difficulty of assessing the extent of current externalities or of forecasting where there is dynamic potential for the future. The strategic IP literature is ambivalent on the balance

between horizontal and vertical measures, with Hausmann and Rodrik (2005:79), for example, suggesting ‘In principle, interventions should be as horizontal as possible and as sectoral as necessary’. Their key point is that horizontal measures that enhance growth can span a range of sectors and access to these should therefore not be restricted selectively. However, they acknowledge that in some circumstances it may be easier to support specific sectors, both as a way of coordinating firms and of organizing the provision of key public goods.

Vertical measures can be broadly classified into three groups:

- Support for any firm operating a specific ‘frontier’ technology, deemed likely to create productivity growth and product innovation, such as ICT, biotechnology, nanotechnology and so forth.
- Support for any firm in specific sectors or subsectors with the potential for significant productivity growth and where it is judged the economy can become internationally competitive (even if this requires restructuring and reduction in size of operation).
- Support for individual firms either as key foreign investors or ‘national champions’ operating in an area with significant potential for growth and competitiveness.

Past applications of IP have used all three approaches and as discussed above, examples of such selective interventions can still be found. In the strategic IP literature, the discussion on vertical incentives focuses on where to place ‘strategic bets’ on technologies, activities or firms which – with support in the short-term – can become competitive in the longer-term. As the bulk of these will be internationally traded, this discussion highlights the strategic choice of how far to invest to try to change an economy’s comparative advantage more rapidly than the ‘natural’ change the market itself would create. This problem relates to identifying where a country’s long-term comparative advantage lies.

The application of vertical policies remains the most controversial aspect of IP and it is conceptually difficult to fully reconcile vertical interventions with the market model lying behind BER, unless we assume that financial market imperfections prevent firms from accessing the credit to allow them to invest in risky activities in which the economy has a potential (but not a current) long-run comparative advantage, or if the BER itself is focused on particular sectors.<sup>23</sup> Vertical interventions under IP are compatible with a sectoral

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<sup>23</sup> Vertical interventions by IP can offer the necessary resources and incentives for the investment that the firms themselves wish to undertake, but otherwise would be prevented from undertaking due to the failure of the financial market. In this case, IP also provides a way of overcoming a market imperfection, however, the argument

approach to BER where it is deemed that regulation and controls put sectors with potential strategic importance to an economy at a disadvantage. This involves focusing BER on specific sectors for the same reasons such sectors receive attention under IP.

A practical approach which has been put forward to bridge the gap between vertical measures and BER is for the supported activities to be broadly similar to those that would emerge if the support was available horizontally to all – in other words, they should be activities consistent with the resources available to an economy and not too far from its existing specialization. This is implicit in the recommendation in Lin and Monga (2010) noted above that countries should use the trade patterns of countries with similar resource endowments and an income per capita about twice their own as a guide to future development. It is explicit in the policy discussion in World Bank (2012: 136) which discusses the options for supporting a set of subsectors within manufacturing in East Africa... ‘ because the proposed approach and the sector-specific support are focused on sectors consistent with Ethiopia’s latent comparative advantage, the extent of government support can be limited and rapidly scaled back as new information arrives.’

Thus, it is argued that vertical measures that are *comparative advantage conforming* will be more compatible with BER as they will create less distortion to the structure of markets. An additional argument is that in developing countries comparative advantage lies in labour-intensive products, so that investments based on latent comparative advantage will create more jobs and thus more significantly contribute to poverty reduction than activities that are *comparative advantage defying*.

Strategic IP goes further, however, by not ruling out the possibility of a limited number of strategic bets on new or ‘distant’ activities. It implies that policy can be implemented flexibly with, in some instances, initiatives for new activities coming from private investors as proposals to a venture capital fund, whilst in others, a state development bank may try to create an interest in a new area amongst private investors and intervene to set up the infrastructure and legislative changes necessary to make this investment possible.

Once the development bank gets involved in promoting a strategic bet with the private sector, it can evaluate the alternatives and act as an intermediary in discussions between government and the private investors. This type of interventionism clearly goes beyond the scope envisaged in BER, but the argument is that novel and growth-enhancing initiatives will only

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is dependent on the assumption that direct reform of financial institutions to overcome the shortage of long-run funding is impractical in the short-run.

get off the ground if risk capital funding and supportive institutions and infrastructure are provided.

### **3.4 Summary**

Experience and economic theory tell us that differences between vertical interventions and BER can be reduced (but not removed entirely) by:

- Implementing a relatively open foreign trade policy that minimizes the differential impact of import tariff protection.
- Using policy instruments to support vertical interventions that operate as directly as possible on the source of any externality and thus minimize by-product impacts.
- Favouring subsectors, activities or technologies rather than individual firms to the furthest extent possible.
- Imposing reciprocity agreements on recipients so support is conditional on performance and terminated within a specified time period.
- Supporting activities not too distant from existing specialization to reduce the scale and duration of selective support.

Nonetheless, there are a number of countries that have successfully applied vertical policies, some of which involved building up activities that initially appeared very distant from the type of goods they were initially producing, whilst at the same time maintaining a high standard business environment.

## **4. Country examples**

This chapter surveys the experiences of four countries in which it is widely agreed that IP operated successfully whilst at the same time the economies maintained a relatively high ranking in terms of the quality of their investment climate. How far the latter was a prerequisite for the former is difficult to tell, in part because we do not have detailed information on BER indicators for the early years of the application of IP. What we can clearly say is that in these cases, IP and BER were compatible, with the main explanation for this likely to be the open trading environment and welcoming attitude to foreign investors adopted by the respective governments.

Here we discuss four examples – two relating to the small island economies of Singapore and Ireland and two to the emerging economies of Malaysia and Chile. What is critical in these examples is that all of these countries applied trade liberalization measures early in their economic transformation since trade taxes and controls are a critical factor undermining the



level playing field of BER. In these successful cases, it seems highly probable that BER – particularly through protection of property rights and the removal of unnecessary regulation – combined with an open trade policy which allowed access to imported inputs at world prices – was critical in attracting the foreign direct investment on which IP in three out of the four country cases was based (Chile is the partial exception). None of these countries pursued a policy that precisely matches the specification of strategic IP but features of the latter can be identified in each of their approaches.

The Doing Business country rankings provide a rough guide to the de jure position which we can expect would influence investor expectations. Detailed data are not available prior to the first data set in 2004-5, but a superficial glance at the 2012 Doing Business country rankings highlights the factor that regulatory and legal reform was compatible with an active IP in the four country cases. Singapore has been the highest ranked country overall in the index and has arguably had the most successful FDI-based industrial policy of any country. Ireland has traditionally been one of the highest ranked countries in the EU (in 2012 it was 10<sup>th</sup> globally). Malaysia is ranked 18<sup>th</sup> overall – ahead of Germany and Japan – whilst Chile at 35<sup>th</sup> is still the best performer in Latin America.

Table 2 illustrates the relatively strong performance of these economies relative to regional or global averages by three of the simple criteria relating to the business environment – average days to start a business, to enforce a contract and to register property.

**Table 2 Performance by selected BER indicators**

<b>2004</b>	<b>Days to start a business</b>	<b>Days to enforce a contract</b>	<b>Days to register a property</b>
Ireland	24	217	38
Singapore	8	69	9
Malaysia	30	300	143
Chile	28	305	31
Average East Asia-Pacific region	73	374	59
Average Latin America and Caribbean	74	471	57
Average High Income countries	27	280	49

Source: World Bank (2005), Table A2

#### 4.1 Singapore

IP in Singapore was driven from the highest level of government with a clear view of the need to upgrade and diversify the economy. Singapore was one of the first countries to set up Competitiveness Reports and to engage in detailed dialogue between government officials and the private sector on the obstacles to business.<sup>24</sup> The investment promotion agency, the Economic Development Board (EDB), pioneered the concept of the ‘one-stop shop’ and foreign company executives served as board members of the EDB. At several points over the last 50 years, strategic decisions were taken to develop new priority areas, based principally on foreign direct investment. In the late 1960s, Singapore was one of the first countries to develop export platforms for labour-intensive manufacturing in electronics. This was followed in the 1970s and 1980s by moves into higher skill activities within electronics and more capital intensive activities like petro-chemicals. During the 1990s, the focus was on upgrading value chains, as in the Manufacturing 2000 Programme based around industrial clusters in subsectors like chemicals, electronics and bio-medical sciences. The Programme was based on detailed analysis across the value chain for the various clusters to identify gaps that needed to be filled, with co-funding provided by the EDB for an equity stake in joint ventures and strategic activities.<sup>25</sup> In more recent years, the major focus has been on building a knowledge-based economy with R and D and innovation at the centre of the economy.

As well as offering foreign investors high standard infrastructure, a stable and welcoming investment climate and access to regional markets through free trade agreements, these shifting priorities were backed by a series of IP interventions that aimed to steer private investment into priority areas. Firm-specific packages with differential rates of tax holidays, grants for new investment and support in terms of factory space were offered in the early years to encourage key firms to locate in Singapore. In addition, the EDB played the role of venture capitalist in key start-ups. Critically important is that through fiscal incentives and the provision of a high standard infrastructure and human capital base, IP in Singapore encouraged multi-national firms to reconfigure their operations on a regional basis by relocating production parts of the value chain in lower wage economies of the region and concentrating activities at the higher end of the chain in Singapore, namely in distribution, services and R and D. The fact that many international firms have made Singapore their regional hub and have located their R and D development activity in the country is attributed to the high standard research infrastructure facilities developed with public funding, as well as

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<sup>24</sup> The report of the Committee on Singapore’s Competitiveness 1998 was written by a main committee with the support of five sub-committees and involved over 100 persons from the government, business and academic sectors. Similarly, the Economic Review Committee Report 2003 on the restructuring of the economy involved consultation with over 1000 persons (Chia, 2005).

<sup>25</sup> See Chia (2005) and Lall (2003). Lall (2003:22) argues that the strategy allowed Singapore ‘to become the leading centre for hard disk production in the world with local considerable local linkages with advanced suppliers and R and D institutions.’

the fiscal incentives offered to encourage R and D within the country (Amsden et al., 2001). Significantly, there has been a churning of foreign firms as those in declining subsectors in Singapore have left, as those in expanding subsectors have grown. The government has implicitly encouraged this process of entry and exit, since all incentives are for fixed periods.

#### **4.2 Ireland**

Success in Ireland in transforming the production structure through foreign investment has been less dramatic than in Singapore and the reputation of the Celtic Tiger has been badly damaged by the recent economic crisis there, although this was due to problems in the financial sector, not in manufacturing.<sup>26</sup> The Irish government, like that of Singapore, had a clear view that it wished to upgrade the production structure, and the Industrial Development Authority (IDA) has operated an aggressive promotional policy since the 1970s aimed at attracting foreign direct investment into new subsectors, principally electronics, software and pharmaceuticals. The fiscal incentives on offer combined automatic and discretionary incentives. The automatic feature was a low rate of profits tax initially at 10 percent and now at 12.5 percent, which is the lowest rate in the EU and has been found to have been highly influential in international firms' location decision (Ruane and Gorg, 1997). This low tax rate was combined with a series of double-taxation agreements to maximize the benefits to investing firms. However, in addition, as in Singapore, particular firms were targeted and offered discretionary packages. The IDA could negotiate grants upfront to cover a variable proportion of the planned investment, with the grant conditional on the firm creating an agreed number of jobs. Ceilings on levels of grant per job were applied but within that range, IDA had discretion in negotiations. All grant payments to firms were put in the public domain to ensure transparency. This heavy focus on foreign direct investment in the IP of both countries has been more controversial in Ireland in part because of the concern that there has been much less technological depth – as measured R and D expenditure to sales – in foreign investor operations in Ireland unlike Singapore. This is an issue both for future productivity levels, but also critical, because if the focus is on relatively low skill operations the investments become considerably more footloose, with a higher risk that they may move to lower wage or lower tax locations.

#### **4.3 Malaysia**

Malaysia shares some of the experience of the other two cases. It was also one of the countries that saw the potential for using foreign direct investment to develop an export-

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<sup>26</sup> In January 2008, Dani Rodrik wrote that the Irish economy 'has become the envy of many others ever since it took off in the 1990's. Behind the miracle lies sensible fiscal policies, a wage accord with labour and –surprise, surprise – a range of industrial policies;' see Dani Rodrik's weblog. Apart from showing how even highly eminent observers can fail to spot problems, the quote reveals the respect with which Irish industrial policy was held by one of the key authors of the new strategic industrial policy.

oriented manufacturing sector relatively early, particularly in electronics. Low wages and tax incentives rather than upfront grants were the principal incentive offered to foreign investors. Efforts were also undertaken in the 1980s to develop heavy and chemical industries, involving tax incentives and import protection, although these are generally regarded as being less successful, with the Proton car project being the best known failure. As in the other two cases, major efforts were made to develop more knowledge-intensive activities. The Multimedia Super Corridor project had the ambitious objective of making the country a regional and global leader in information technology-based services. Incentives on offer within the 75 kilometre corridor included hard infrastructure, transportation and fibre-optic telecommunications, as well as soft infrastructure in the form of both tax incentives and a conducive legal and regulatory environment, with legislative changes introduced to protect new investors.<sup>27</sup> Firms supported under the project were required to meet employment targets and to specify how they would transfer technology or knowledge or otherwise contribute to the development of the corridor. Eligible products and services could come from anywhere in the value chain for multi-media activity – whether from content, distribution or the user environment. National and foreign firms were given equal treatment and in 2005, a majority of firms were locally owned.

IP in Malaysia was driven at the very highest political level, with then-Prime Minister Mahathir demonstrating strong personal commitment to several of the modernization schemes, including the Multimedia Super Corridor. Strategic shifts were typically based on detailed Master Plans, with the private sector closely involved in discussions over detailed implementation.<sup>28</sup> Development agencies in different regions were given the responsibility of not only promoting inward foreign investment, but also of linking these investors with local suppliers. In electronics, in some regions, such agencies have been credited with playing a key coordinating role in linking local suppliers with foreign investors and thereby deepening linkages within the economy (Oyelaran-Oyelinka and Rasiah, 2009). Significantly, the government was willing to put public funds into strategic bets on new activities. These major initiatives started with support for palm oil production in the 1960s, which became highly successful but was perceived as extremely risky at the time and was followed by support for electronics, automobiles, petrochemicals and more recently, ICT and multi-media. As noted, not all of these efforts have been deemed successful, but the willingness to take risks as part of a programme for structural change was one of the key characteristics of policy in Malaysia.

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<sup>27</sup> Yusof and Bhattasali (2008:21) describe this as a cluster approach to reform which they see as more realistic and effective than focusing on a single binding constraint.

<sup>28</sup> How far the private sector initiated as opposed to participated in this process is less clear. Yusof and Bhattasali (2008) imply that key measures like the privatization programme and the Multimedia Super Corridor were driven by government, with the private sector only involved in the implementation and not in the design stage.

#### 4.4 Chile

The final country example is Chile. Despite its strong tradition of neoliberal economic policy since the Pinochet years, there has also been a modest and increasing use of interventionist measures to alter the allocation of resources. An early use of a strong vertical intervention was a policy package introduced by the military regime in the early 1970s to develop the forestry sector to exploit pine timber. This involved legal changes protecting land purchased under the scheme from subsequent expropriation, cash payments to developers of 75 percent of the initial cost of planting and subsidized credit lines to forestry companies. The potential for pine forestry in Chile had been under discussion for a long time, but this initiative nonetheless represented a strategic bet, which most observers conclude was highly successful, as wood remains one of the country's major exports. Recent horizontal measures have included a range of innovation subsidies, largely grants but also tax incentives available across subsectors, borrowing guarantees for small enterprises with size of borrower the criteria for inclusion, and a subsidy to new exports of up to 10 percent of sales revenue (in lieu of a duty drawback) which was dropped as non-WTO compliant in 2003.

In the period since 2005, vertical measures have become increasingly significant, although their overall scale relative to size of the economy is still modest. The National Council on Innovation and Competitiveness set up by the President in 2006 issued a report in 2007, highlighting priority subsectors that showed good prospects in world markets and were close to the country's current specialization. In terms of incentives on offer, risk capital is available through Fundacion Chile whose success in sponsoring the application of Norwegian technology to develop salmon exports was one of the key examples cited by Rodrik (2007) in his discussion of strategic bets. Fundacion Chile has focused on the application of foreign technology in six subsectors, mostly related to natural resources – principally marine, forestry and agribusiness.<sup>29</sup> In addition, the main initiative sponsoring innovation, Innova Chile, has partly shifted to a subsectoral basis with a set of priority clusters. The other main vertical programme has been to attract foreign investment in ICT-related activities, covering software, hardware, multimedia, biotechnology and pharmaceuticals, through assistance in dealing with the bureaucracy and upfront cash grants for feasibility studies. If the investment goes ahead, grants for land and buildings purchase, training and first year wage costs are also available. These are negotiated on a case by case basis. The programme was originally launched in response to Intel's decision to locate in Costa Rica rather than Chile. It has clear similarities with the approach followed in Ireland, but the funds available to the IDA in Ireland have far exceeded those for the Chilean programme.

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<sup>29</sup> Not all of the investments of Fundacion Chile have been profitable and included social terms; see Agosin et al. (2010).

#### **4.5 Summary**

These four country cases reveal several broad similarities:

- A committed government with a long-run vision on diversification and innovation and policy continuity in the operation of incentives.
- A willingness to support new dynamic activities with fiscal and other incentives.
- An awareness of the need to attract foreign investment and foreign technology to develop new activities.
- A willingness to offer a range of incentives, often as firm-specific packages.
- An outward-looking rather than inward-looking trade policy which exposes recipient firms to competition in export markets.

Each of the countries are relatively small, with high levels of education attainment and political stability, conditions that make them atypical, particularly in comparison with some of the less developed economies of sub-Saharan Africa. However, these examples reveal that IP has been operated successfully in countries with what most observers would judge to be a relatively good business environment and certainly well above the norm. Arguably, the open foreign trade policy and the welcoming attitude to foreign investors were critical in creating this compatibility, even in economies where it is clear that vertical interventions have been used, in some cases very extensively.

#### **5. Capabilities for successful IP and BER**

DCED (2008) sets out 15 principles to guide the practical application of BER, all of which are likely to apply almost equally in relation to the application of strategic IP. For example, understanding the political economy of change, working with governments, focusing on the needs of the private sector, ensuring donor coordination, ensuring transparency and focusing on the key binding constraints are all recommendations that can be found in the literature on IP.

In the light of experience from the countries surveyed above and elsewhere, several working practices can be identified in relation to the application of IP. Both continuity of policy and high-level political commitment appear critical. The operation of Competitiveness or Deliberation Councils or similar bodies mandated to support restructuring has been likened to independent Central Banks, which have a clear focus on policy targets, an independent advisory board and high-level political membership. The main Council can have several subcommittees with appropriate business associations and trade union membership, as well as the participation of NGOs, academics and other industry experts.

However, establishing a comprehensive set of committees within this institutional framework is no guarantee for the emergence of a successful set of policies. Particular problems relate to the need to ensure coordination between government ministries and departments. Even where the private sector can clearly articulate its priorities in relation to competitiveness, for example, in relation to a road building programme, it will be important to ensure that the actual public sector road projects selected are based on efficiency criteria (like links to a port) rather than overtly political criteria (like rewarding a regional power base). Similarly, once vertical programmes are in place, there is the risk of inclusion in the favoured list being driven by lobbying rather than by economic potential.<sup>30</sup> The ability of private business associations to speak for all their members is also an issue, since it is clear that there can be a divergence of interests between producers in different subsectors, between exporters and non-exporters and between large and medium as compared with small firms. In some countries, such associations are not independent of governments and their views correspondingly reflect official policy.

### **5.1 Procedures and institutional arrangements**

The main procedures and institutional arrangements that have been suggested for the effective application of strategic IP are:

- Link any intervention with a clear economic rationale in terms of what problem is to be overcome and why the intervention selected is the best option.
- Ensure transparency in the incentives offered (even if the process of negotiation remains obscure in firm-specific arrangements).
- Where possible, use cost sharing with the private sector to ensure a ‘buy-in’.
- Build targets for both sides – government and business – into subsector support programmes and set a time limit on all incentives.
- Use an evidence-based approach to priority setting.
- Ensure one body within the government has an overall responsibility for IP/competitiveness policy.
- Establish regular firm-level surveys to canvass opinion and to collect benchmark data, particularly on parameters within the government’s control.
- Encourage the creation of an inclusive overarching business association that can speak authoritatively for the whole private sector, with subcommittees that address sector or subsector issues or those that cut across specific sectors.

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<sup>30</sup> Colombia has created an impressive institutional framework along the lines recommended by strategic IP, whilst Melendez and Perry (2010) still conclude that policy is dominated by special interests and rent-seeking.

There is widespread agreement that IP requires a public bureaucracy which has the capacity for independent initiative, where promotion and placement is on merit and where remuneration is high enough to retain high standard staff. The operating principles that governments need to strive to apply are also well understood and do not differ significantly from those required for BER. These cover:

- *Transparency* to facilitate the flow of information in both directions between business and government.
- *Reciprocity* to ensure state support for firms is matched by efforts at improved performance.
- *Credibility* to ensure that the private sector believes in the consistency of policy, even where it needs to be adjusted in the face of changed circumstances.
- *Trust* so that a long-run relationship between government and private sector can be established to give stability to a project of economic transformation and technological upgrading.

The academic analysis of these issues identifies a successful state sector that can embody these principles as one which is both independent of particular private interests, so it can pursue a long-run developmental agenda in the interest of society at large, whilst at the same time it understands and can network with the private sector ('embedded autonomy') (Evans, 1995). Creating the preconditions for such an inter-relationship is clearly complex, since it requires not just an independent meritocratic public bureaucracy, but a private sector that can see the merit of a long-run national project for economic transformation.

## **5.2 Role of business associations**

Political economy analyses of successful IP have usually drawn on East Asian experience and have focused on the corporatist nature of public sector-private sector relations, in which a relatively small number of major economic interest groups are represented as compared with authoritarian regimes where leaders override such groups or pluralistic regimes where there is competition between large numbers of interest groups. Such analyses often focus on the role of perceived external threats in galvanizing the private sector in support of a project of national economic transformation (Wade, 1990). The role of business associations as representatives of the private sector are central to this corporatist structure. In many instances in the past, such associations have pursued goals related directly to vested interests, but there is also evidence that in other cases, they have collaborated with governments in ways which clearly match the strategic IP agenda, for example, imposing export standards on members, allocating export quotas between producers, sharing information on markets and technologies, setting up training or technology institutes and occasionally organizing a phasing out of



production capacity between members.<sup>31</sup> In most countries, they have been strong advocates of BER. They also provide information on government regulations, undertake lobbying activities and offer support for conflict resolution of legal matters, although in many countries, it is their interface with government which is critical.<sup>32</sup>

Not all business associations have operated in a developmentally benign way, however, and three aspects have been put forward to explain what is different about the successful cases:

- The scope of their membership so there is widespread coverage amongst producers in a sector.
- The extent to which membership gives access to benefits not open to non-members.
- The effectiveness of their internal procedures for mediation (Doner and Schneider, 2000).

Other things being equal, an association that covers a high proportion of relevant firms is likely to speak more authoritatively and be more representative of the sector's interest. Similarly, collective action between members is more likely to occur where membership conveys important benefits, such as access to policy debates. Internal organizational forms based on voting rights proportional to size, flexibility in adjusting internal rules, transparency in decision-making and the scope for discussion between members have been highlighted as good practices.

Internal characteristics alone are unlikely to explain why some but not other associations function in the wider economy as opposed to the sectional interest, and the external economic environment in which they operate has been given a key explanatory role. In the successful cases, it is suggested that exposure to competition, particularly foreign competition through trade liberalization, was a key factor in ensuring that the collective activities of members were driven towards raising efficiency rather than creating rents or surplus profits. This matches the link between BER and trade liberalization we have highlighted and the role given to exports in the explanations of the successful application of IP in East Asia. Government intervention is also seen as important in disciplining association behaviour through a system of reciprocity, whereby associations and their members are granted benefits in return for meeting key objectives, like raising export quality or volumes. This is the 'carrot and stick' approach referred to in the strategic IP literature.

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<sup>31</sup> Doner and Schneider (2000) survey these examples from a range of countries.

<sup>32</sup> Te Velde and Leftwich (2010) survey recent research that quantifies the beneficial role of strong business associations for economic performance in several African case studies. A separate firm-level analysis across seven African economies finds that business association membership is a significant negative factor explaining the level of informal payments made by firms; see Quereshi and te Velde (2012), Table 6.

Much of the literature stressing the role of business associations in development has been based on past East Asian experience that may be of limited wider relevance. It is recognized that in developing countries, there may be only a few key business leaders who prefer to deal directly with governments rather than indirectly through associations. It is of interest that recent empirical work on sub-Saharan Africa suggests that good ‘state-business relations’, part of which involves representative and active business associations, is associated with higher economic growth after other causes of growth are controlled for (Sen and Te Velde, 2009).

Nonetheless, business associations are only one side of the public-private dialogue envisaged by strategic IP. A recent review of country experience has highlighted that in a number of successful cases, a small dedicated team of experts working closely with very senior figures in government has played a critical role in developing and updating a broad view of economic strategy, leading the dialogue and policy negotiations with the private sector, linking with donors and coordinating the overall public sector administration. Key teams were small, drawing on administrative, legal, engineering and economic expertise, with foreign advisers involved at times.<sup>33</sup>

In terms of the skill set needed for the public sector to implement IP, this in part depends on the ambition of the IP agenda. If the focus is on the investment climate and business environment, then the bureaucracy will need a cadre in which those with both legal and regulatory backgrounds are strongly represented. If the focus is more ambitious in terms of implementation of aspects of strategic policy, staff will need knowledge of key aspects of economic policy, such as the rationale for public sector involvement and the choice of policy instruments, as well as aspects of investment planning both in financial and economic terms. In lower income contexts where the private sector is relatively weak, investment priorities and ideas for policy intervention to remove constraints may need to be obtained from specially commissioned surveys by either foreign or local consultants, and donor funding may play an important role here as well. Even in this context, if there is to be ownership of the process, there will be a need for the data collected and the ideas behind it to be understood by government officials. In applying these policies clearly, the independence of the bureaucracy from ‘capture’ by private interests will be important and, hence, judicial and legal reforms to penalize corruption as part of BER will reinforce any technical training in developing the capability of public sector staff. As private sector business associations are to be a key vehicle for partnership with the public sector in strategic IP, support from donors may also need to be provided to strengthen the capacity of association staff.

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<sup>33</sup> See Criscuolo and Palmade (2008). The authors cite high growth performance created by small ‘world class’ teams working for the government in Botswana, Cape Verde, Malaysia, Mauritius and Taiwan.

### **5.3 How to be selective**

With limited resources, public sector support will inevitably have to be used selectively, even where horizontal measures are used since some activities will be supported and others will not. Where vertical targeting is used, the choice will be even more apparent. Given that most countries now operate in an open international trading environment, most activities are potentially tradable, so the key question is where long-run competitive potential lies. The closer vertical measures are to existing comparative advantage, the more compatible they are likely to be with the horizontal approach of BER. Several possible approaches to identifying competitive potential can be found in the academic literature. Appendix 1 sets out an approach that combines different strands of the literature.

## **6. Recommendations to donors**

The following chapter proposes a series of recommendations to donors wishing to engage with industrial policy as part of their country support programmes. It discusses six broad areas under the headings of objectives, institutional framework and governance of industrial policy, safeguards and control mechanisms for vertical interventions, policy initiatives, information requirements and implementation.

### **6.1 Objectives**

There is no unique policy blueprint for industrial policy. Governments have choices on how far to let the private sector initiate the process and how far to drive it themselves, on how far to use horizontal (generally available) or vertical (selective) measures, and on the type of policy instruments to apply. These choices are highly context-specific and will be taken based on societal consensus, past experiences, existing institutions and capacities. Also, if they choose, governments can interpret IP in very broad terms – as interventions aimed at meeting a set of policy objectives – on, for example, growth, poverty reduction, employment and environmental sustainability. In line with the focus of the original literature, this Report prefers to retain the original focus of IP on growth and productivity objectives on the grounds that introducing a set of trade-offs with other objectives, whilst conceptually possible, is extremely complicated to apply accurately in practice, and runs the risk of inconsistent decision taking. The exception to this is foreign investment projects where the local employment effect will be the main short-run gain for the country and the incentives on offer can be quite reasonably compared with jobs created.

### **6.2 Institutional framework and governance**

Strategic IP places great emphasis on ‘discovery’ and innovation and sees a regular and constructive dialogue between the government and private sector as central for achieving this.

Hence, if donors wish to support strategic IP, they should assist governments in creating the appropriate institutional framework and governance structure to maximize the potential for dialogue and interaction. The model of strategic IP implies a form of overarching competitiveness or a deliberation council with high-level political representation and the involvement of senior figures from the business, labour and NGO sectors, as well as other civil society representation. This council can set broad strategic parameters and act as a coordinating agency for bodies dealing with all aspects of IP. It should have the budget to fund key public goods identified as necessary by the private sector and other initiatives (such as those detailed below) to support new activities, whilst at the same time pushing for legislation and changes in procedures to support BER.<sup>34</sup> In countries where such a body does not yet exist, donors should encourage its establishment and consider providing funding to support its technical secretariat.

Below this overarching council, there can be subcouncils that address specific issues on a sectoral or cross-sectoral level, like training, innovation or specific infrastructure areas or on a sector basis - textiles, clothing, engineering and so forth.<sup>35</sup> The strategic IP literature stresses that their focus should be determined by country circumstances and the perceptions of the private sector on the nature of key constraints. There should be 'self-discovery' in policy formulation with policy learning as important as entrepreneurial learning.<sup>36</sup> There is no prescriptive format and the ideal is seen as self-organization driven by the needs of the private sector. The groupings would discuss key issues of policy relevance and in one version could forward recommendations to the overarching body, although alternatively, these could go directly to government. Such bodies would have modest budgets funded partly by government and partly by the private sector to cover their secretariats and if they prove successful, this joint funding could be expanded to allow the groupings to fund the supply of public inputs (such as trained workers or infrastructure improvements). The composition of these subgroups is kept vague in the literature, as is their exact mandate. In practice, unless there is strong demand to create such groups around specific themes which are relevant across sectors – like training or infrastructure – it will be simpler to start with a sector or subsector focus.

The dialogue aspect of strategic IP means that the public sector must have a partner with which to negotiate on growth constraints and investment options. This requires that the private sector be organized in coherent groups and the expectation must be that this will normally be a form of business association. Whilst such associations can be at the subsector level representing particular producer interests, good practice suggests that the presence of an

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<sup>34</sup> Hausmann and Rodrik (2005:77-78) recommend the establishment of such a Council for El Salvador.

<sup>35</sup> Hausmann et al. (2008: 7-8) set out these ideas in the context of South Africa.

<sup>36</sup> Hausmann and Rodrik (2005: 77).

overarching association, representing different sector associations and the interests of the private sector more generally, helps in negotiations with the overarching council.

Given the importance strategic IP attaches to dialogue, in less developed countries donors should consider providing technical assistance to sector business associations to raise the professional level of their secretariats to allow them to elicit the views of members and to conduct their own surveys and analysis of data critical to policy debates. In addition, where no overarching association exists, donors should encourage its creation and provide technical support as necessary. Such associations would normally be important champions of BER and, hence, their creation or strengthening will also support the BER agenda.

However, there is always a risk that strong associations will act as champions of sectional interests or are dominated by a few large firms with close links with government. To combat this risk, there is a strong case for combining any support with initiatives to develop a more competitive market environment, for example, by strengthening any competition commission or agency, providing evidence on the cost to consumers of inappropriate business practices and working with civil society groups to develop a culture of competition.

### **6.3 Selection mechanisms and safeguards for vertical interventions**

Strategic IP, which focuses only on horizontal market-supporting interventions and which allows ideas for new initiatives to emerge from deliberations between government bodies and the private sector (as envisaged in section 6.2 above), should be wholly compatible with BER. Further, as we have noted, there is evidence that the sort of dialogue envisaged as part of strategic IP may strengthen the constituency for BER. Complications arise where vertical interventions are involved.

The simplest way around the incompatibility with BER is to focus selective support on those activities that are not too ‘distant’ from those in which the country is currently specialized in or, in other words, those in which it has latent comparative advantage that has not yet been realized (if it had, they would not need support). In developing countries, products in this category will draw on the natural resource base or unskilled labour content of the economy. Theoretically, in supporting such goods, IP can be interpreted as merely anticipating a shift in relative prices that the market itself would generate in a few years. Hence, for this type of activity, the expectation will be that the support needed will be modest and will only be required for a relatively short time (say 3 to 5 years). The distortionary impact of such support on the business environment can be expected to be relatively low.

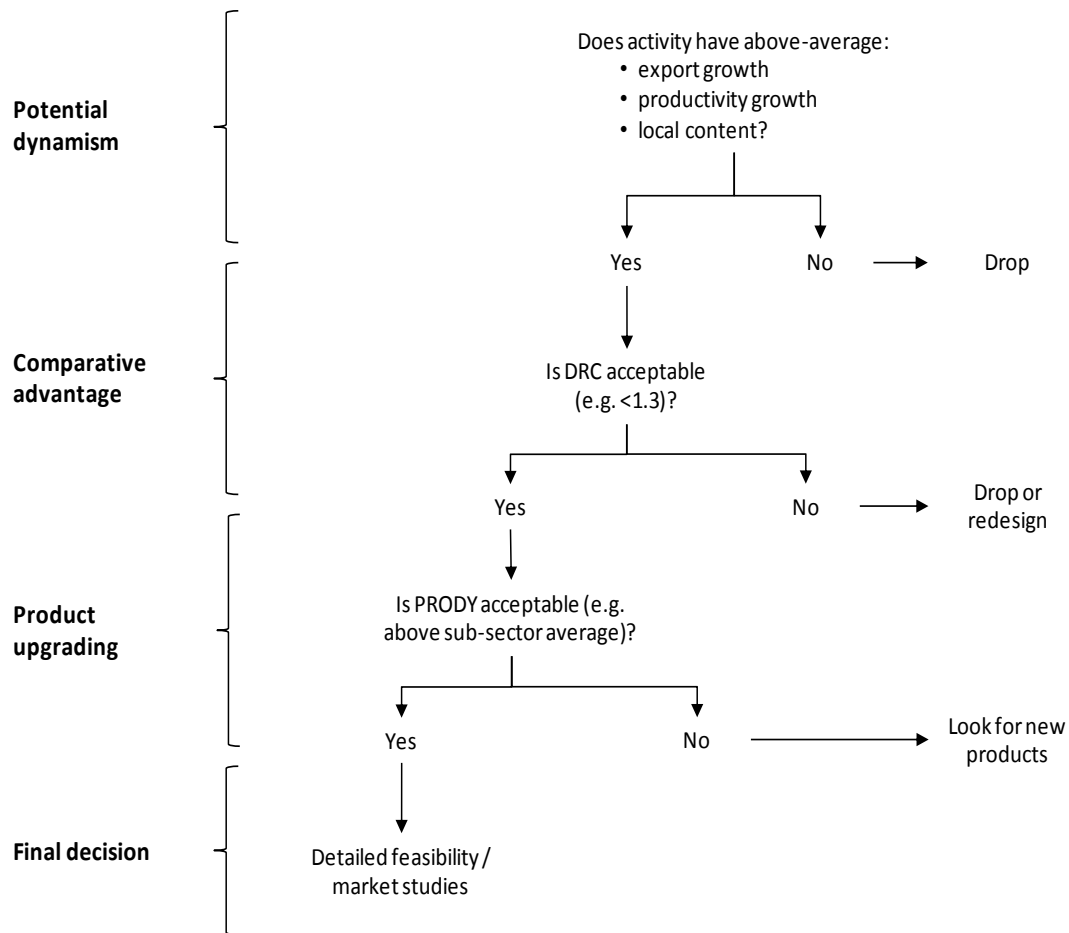
The more interventionist form of IP, relevant in a low income context where private sector initiatives cannot be relied on, could start by a simple screening of different subsectors using

data from industrial surveys and trade statistics. Existing export levels and trends and the extent to which an economy is specialized in different categories of products provide a useful starting point. Similarly, data on the share of local raw materials in output value and on recent trends in labour productivity will also be relevant. The intuition here is that promising new products are likely to be found in the subsectors with one or more of the following:

- a recent track record of export success
- a relatively high local resource content
- and above-average productivity growth.

Once some candidate areas have been identified, more detailed information can be collected either from project feasibility studies provided by the prospective private investors or by firm level surveys to ascertain the revenues and costs amongst existing firms producing in the area. The Domestic Resource Cost indicator (DRC, described in the Appendix) provides a relatively rigorous best practice approach to assessing how far a new project proposal or existing operations are from an economy's comparative advantage. If the appropriate data can be collected, activities should only be supported if at the stage of initial screening, the DRC does not exceed unity by more than a margin that can realistically be eliminated by domestic productivity growth or real exchange rate re-alignment. The exact cut-off will depend on what is deemed likely concerning these trends, but in most cases, anything above 1.3 is likely to be a cause for concern. The product indices discussed in section 1.8 can be combined with the DRC results to suggest potential areas for product upgrading (see Figure 1 for a summary).

**Figure 1**      **Selecting products to support**



Approaching vertical support in this way aligns IP with economic theory, but it may not provide a tool for supporting strategic bets on totally new activities. Much of the risk-taking around which venture capital funds, for example, are based cannot be addressed in this way. It is highly unlikely, for example, that salmon fishing by Fundacion Chile or the development of mobile phone technology by Nokia of Finland would have passed the DRC test referred to above had it ever been applied. For such genuine innovations, formal calculations may have to be replaced by judgements about the development of markets and about the capacity and vision of the innovators. Where public funds are involved in supporting products or technologies new to an economy, some form of quantitative comparison of costs and benefits will be required, but the key point is that the more innovative the area, the less likely it is that we can place too much reliance on projections of what the future will bring. The key concern is that where publicly-funded venture capital or development banking schemes are used, the institutions are able to monitor the progress of borrowers, assist in removing bottlenecks and cease support as necessary if the investments do not take off.

Other safeguards that are important ingredients of strategic IP and which would also serve to keep such policy in line with the principles of BER include:

- A relatively open foreign trade policy to ensure that for internationally traded goods domestic prices and world prices do not diverge significantly.<sup>37</sup>
- A fixed and relatively short timeframe for vertical measures.
- Equal treatment for all firms that qualify for support either on a first come, first served basis or on the basis of open competition.

#### **6.4 Policy initiatives**

Most governments currently offer various forms of support to firms as well as pursuing a BER agenda. Strategic IP has identified a series of initiatives to support innovative and dynamic activities for governments and donors to consider, which do not conflict in a major way with a broad definition of BER. Possible examples include:

- *Creation of a fund for the provision of public inputs required to support new investments.*

In a narrow sense, public inputs are physical infrastructure required to support new investment that the private sector will not supply at an adequate level. In a broader sense, they cover physical infrastructure plus a range of ‘soft’ infrastructure, such as training needs, R and D investment and administrative reform. The private sector through business associations would be invited to submit proposals to the fund by making a business case for why a particular change is needed. Bids to the fund would be assessed by the body with overall responsibility for competitiveness (see 6.2 above). A requirement for private sector co-financing could also be included to ensure commitment to the initiative. In principle, this could be a horizontal measure open to firms in all activities or it could be applied on a vertical basis, highlighting what are perceived as strategic or priority activities.<sup>38</sup>

- *Creation of a fund to finance feasibility studies.*

Similar to the fund for public goods, another smaller fund can be created to finance feasibility studies and pilot projects that relate to new activities for the economy. In this case, proposals would be invited from individual firms or consortia based around business associations. Again, co-financing with private investors would be desirable

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<sup>37</sup> Technically, this should ensure that domestic prices reflect the opportunity cost of the goods concerned.

<sup>38</sup> Implementation of such a scheme in Colombia has followed vertical lines. However, the intention appears to be to proceed in stages by widening the sector scope and to support proposals from any sector, provided there is a convincing economic case. See Melendez and Perry (2010: 15).



and the fund could either be open to all areas of the economy or only selectively to limited priority areas. Pilot schemes to test an existing technology in a new country location could also be considered. In practice, many governments offering such support have done so selectively, with electronics and ICT usually seen as candidates.<sup>39</sup>

- *Tax incentive for new activities*

To encourage the production of any product or service genuinely new to an economy, a lower rate of profits tax (or a longer period of tax holiday where one generally applies to all new investments) can be applied. This differential tax concession could be linked with the value of total domestic output of the good in question (not just the output of an individual firm), and could be retained until this total output surpasses a minimum value. The complication with this proposal is in ensuring there is genuine novelty in the product and that it is classified accurately in national production statistics. It would be up to an investor seeking this preferential treatment to document their case before the overall competitiveness body. Linking this scheme with trade data is simpler because of the detailed HS classification, but if challenged, it would not be WTO-compliant.

- *Creation of risk capital funds to finance new investments*

The most significant proposal in terms of commitment of resources to emerge from the strategic IP literature is the idea that the public sector should pool risks with the private sector by investing in selected innovative high-risk, but high-return activities. This requires either the creation of a public sector venture capital fund or the instruction to an existing development bank to play this role. This type of scheme can be implemented with differing degrees of public sector activism. At one level, the venture capital fund can be relatively passive and wait for proposals from the private sector. Alternatively, it can be proactive, seek out new opportunities and look for private sector investment partners. Alternative proposals can be evaluated and the venture capital fund can play the role of champion for a particular activity in discussions with the competitiveness body and government departments. How far it is appropriate to play a reactive or proactive role will vary with the capacity, experience and confidence of the staff of the institution and the dynamism of the private sector. Where the capacity to set up such a scheme is lacking, an alternative is a form of

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<sup>39</sup> For example, the application of this approach in Chile initially was on a vertical basis in ICT only, and once a firm invested following the feasibility study, they were also eligible for land and training subsidies. More recently, other activities relating to technological development and renewable energy have been added; see Agosin et al. (2010: 37-38).

guarantee fund that guarantees up to a certain proportion of a commercial bank lending to specified types of investors. Although usually applied in the case of small firms, this approach could be used for firms that are classified as appropriate borrowers under criteria relating to innovation specified by the competitiveness body. Recipient firms would pay a fee of a percentage of the guaranteed capital and would have to provide evidence of ability to pay. This is likely to be an inferior solution to the venture capital model since the government would face the down-side risk of failure and non-repayment, but would not share in the upside benefits from a high return. Nonetheless, it is an option which removes the need for detailed scrutiny of the borrower by the venture capital institution or a development bank, with commercial banks determining how funds are allocated.

- *Sector/subsector reviews*

The above initiatives follow directly from the strategic IP literature. However, they presuppose a relatively active private sector that can respond to government initiatives. They also imply that the key concern is to develop new activities and new ways of doing things for the economy. Whilst this may be the key challenge in middle income and some lower middle income economies, it is less obviously the case in less developed economies. There, in a majority of instances, the key problem, at least for industry, is to rehabilitate and modernize existing production facilities and to overcome critical bottlenecks to well-established activities. In this sort of environment, some of the precepts of strategic policy may be less relevant. Whilst involvement of the private sector in a policy dialogue remains uncontroversial, the government with the help of donors is likely to retain a greater role in initiating change in such countries than the strategic policy case implies. In these circumstances, it is recommended that governments undertake both regular consultations with the private sector and, in addition, sponsor sector-focused reviews of the binding constraints as they affect enterprises in the sector. A useful way of organizing this is to use benchmark data from one or more competitor economies and to assess in a problem tree framework why costs or product quality in the economy concerned differ from the comparator's. Box 1 provides a simple illustration. Data such as this can provide the basis for government intervention to support the chosen areas, with intervention covering both policy change and financial support, as necessary.

### Box 1 Cost comparison: Problem tree illustration

For a given product, such benchmarking studies can compare unit costs at different stages in the value chain for firms in the economy concerned with those in a regional competitor or with the market-leading economy, which for an increasing number of goods is now China.

The data below give a simplified illustration for an item of clothing, a polo shirt.

Polo shirt value chain										
	Country A				Country B				China	
	US\$	%			US\$	%			US\$	%
Fabric	3.355	0.55			2.652	0.51			2.4	0.6
Cutting/layering	0.122	0.02			0.052	0.01			0.08	0.02
Sewing/assembly	1.83	0.3			1.352	0.26			1	0.25
Finishing	0.183	0.03			0.104	0.02			0.2	0.05
Packing/loading	0.122	0.02			0.104	0.02			0.12	0.03
Administration	0.488	0.08			0.936	0.18			0.2	0.05
Cost	6.1				5.2				4	

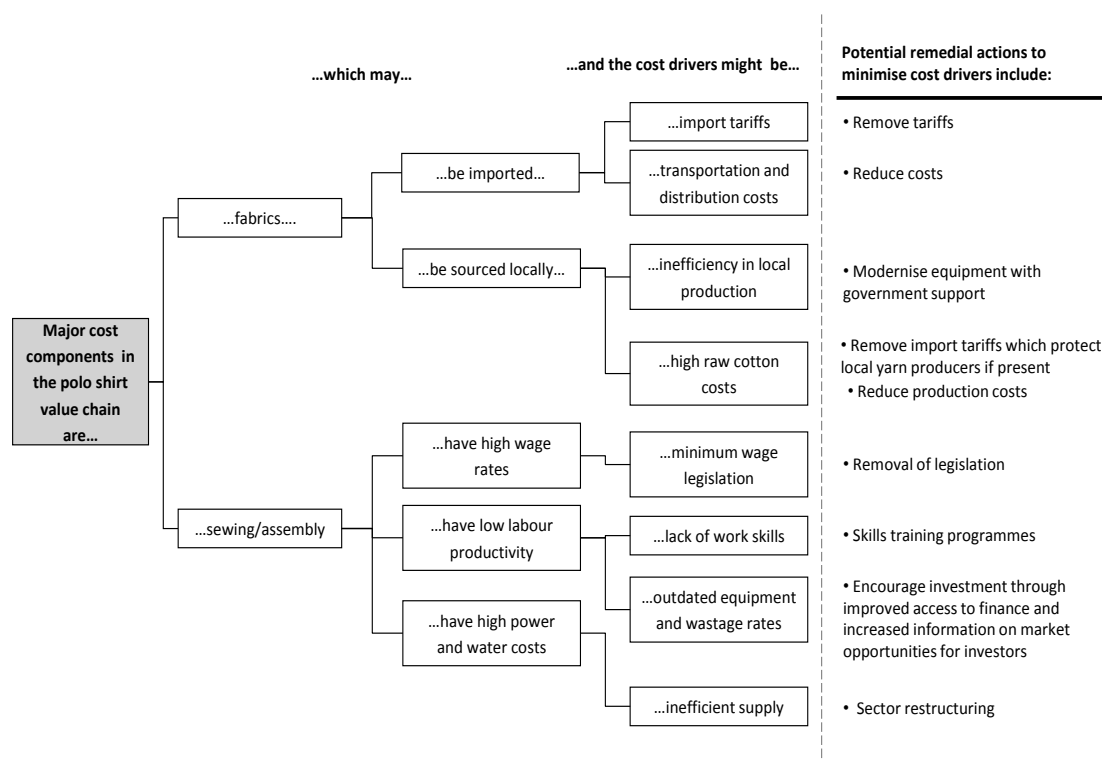
As the comparison is across countries, cost refers to an ex factory price. A simple comparison shows country A to be more expensive than its regional competitor B and China, and the issue is why. In the example, two factors drive this – the cost of fabric and the cost of sewing/assembly. A simple problem tree framework can be applied to these key parameters as illustrated in Figure 2 to elicit the implications for policy.

If fabric is imported to A, is its cost high because of an import tariff or because of port to factory transport and distribution costs? If the former, should the tariff be removed, if the latter, what can be done to lower these costs? If fabric is sourced locally, is cost high because of inefficiency in local yarn production or due to the high cost of raw cotton? Is this inefficiency due to old equipment and, if so, can it be modernized with government support? Is there an import tariff that protects local yarn producers and can it be removed? Can raw cotton production costs be lowered?

Sewing and assembly is the other major cost component. Is the relatively high cost in A due to high wage rates, low labour productivity or high power and water costs? If productivity is the issue, how far is this attributable to lack of worker skills and how far to outdated equipment with high wastage rates? How far can skills be improved by training programmes? Is lack of investment in new equipment due to lack of access to finance, to risk aversion or to lack of information on market opportunities?

The answers to these questions imply different things for policy intervention, but the key point is that it is clearly preferable to focus directly on the most binding constraint rather than relying on indirect measures. For example, if the problem for polo shirt production is high cost local fabric, it makes little sense to fund investment in new sewing machines. Hence, a benchmarking focus within a value chain should assist the application of IP.

**Figure 2 Example of polo shirt value chain cost drivers and cost reduction actions**



## 6.5 Information

Donors already collect large volumes of data on all aspects of recipient countries. For example, the UN has a comprehensive trade database (COMTRADE) and UNIDO collects sets of industrial production statistics. Both of these data sets can be used to analyse trends in particular economies that are relevant to strategic IP. For example, as a measure of innovation, trade data can be used to establish how many new products a country is exporting each year. This requires identifying new entries in the exports statistics of a country (for example, at the HS 4 or 6 digit level). The trend in the number of new export products across years gives an indication of the innovative capacity of an economy (provided critically that there are no entry errors in the HS classification).<sup>40</sup> A second measure of innovative capability at the aggregate level is to calculate the PRODY measure for total exports discussed in the Appendix. The absolute level of PRODY relative to competitor economies and its change over time give an indication of the depth and sophistication of the internationally traded sectors of an economy.

To reconcile concerns over the compatibility of BER and strategic IP approaches, donors could consider undertaking detailed country studies of the impact of IP on economic performance and its implications for the business environment. The studies on behalf of IDB

<sup>40</sup> UNIDO (2011: 40) looked at this approach in Mongolia since it had been applied by an earlier World Bank study, but concluded that much of the apparent product innovation in an earlier period was due to product misclassification.

for Chile and Colombia referred to above are excellent examples of detailed rigorous assessments of IP. In addition to one-off reports, for countries where there has been a major move to introduce IP measures, donors in conjunction with recipient governments might also wish to consider regular country IP reports similar to the Trade Policy Reports produced by the WTO for its member countries. The key policy incentives under IP could be classified as horizontal and vertical with their rationale and evidence on their impact on performance and BER focus (see Box 2).

### **Box 2 IP Reports**

WTO produces Trade Policy Reports for its member countries and donors should consider producing regular IP Reports. These could:

- Survey the key institutional organization of IP in the country concerned, namely the key bodies (competitiveness/deliberation councils, business associations), frequency of meetings and their key agendas.
- Highlight any policy changes since the last Report.
- Present the key policy incentives under IP classified as horizontal and vertical with their rationale, and evidence on their impact.
- Summarize information on BER, for example, from the Doing Business database or Investment Climate Surveys, and any impacts on BER created by IP interventions.
- Present information on measures of competitiveness and innovation, such as PRODY estimates, numbers of new exports, as well as more conventional measures like the R and D to GDP ratio or manufactured exports as a share of total exports.

## **6.6 Implementation**

Building a team of government officials who can operationalize the use of IP will be important. One option is to establish a small data gathering unit in the relevant ministry, strengthening data collection agencies and building teams that can interpret and update relevant trends and apply relevant techniques for assessing investment priorities. Training of public officials in how to conduct basic economic analysis of investments (such as use of the DRC, risk analysis and cost-benefit analysis more generally) should be considered where governments need to take initiatives to identify specific areas for support or to check the economic impact of private sector proposals that will draw on public funding. Similarly, donors could consider supporting consultancy studies aimed at benchmarking costs of production against competitors and establishing weaknesses in the value chain. Data from such studies can inform dialogue on policy reform.

Accountability in the use of funds for IP is critical, so monitoring and evaluation will be required. Transparency will be important so the support for firms under any of the schemes discussed above should be documented with a clear rationale given. Where firms receive

support on condition that they undertake certain measures, like training workers, investing in R and D or equipment or providing infrastructure, a reporting system should be built into the process, with sanctions if promised actions are not undertaken. In addition, there should be periodic ex post evaluations of selected projects funded under IP initiatives, including the results of venture capital lending, with reports published by the overarching deliberation council. These evaluations can be carried out by donors themselves or preferably by a joint team drawn from the donor agency and the overarching body.

Strategic IP is not designed as a costly policy to implement as it is more concerned with a process of dialogue and the identification of constraints than with expenditure per se. The estimates referred to in the original literature are modest as a share of total government expenditure. In their report on South Africa, Hausmann et al. (2008) suggest that 4 percent of the cluster development budget be set aside to finance ‘specific public inputs’ which are to be allocated on the basis of proposals from the private sector. Actual allocations under schemes in Chile and Colombia that resemble the strategic IP model have also been very modest up to now.

Risk capital funding through development banks or venture capital funds could potentially be large, but the emphasis of the literature is more on modest start-up funding rather than on grandiose schemes and it would be difficult, particularly in low income economies, to justify putting large sums of public money into high risk projects.<sup>41</sup> Although the original strategic policy model does not see IP as a form of infrastructure programming, insofar as infrastructure bottlenecks emerge as a key constraint in the public-private dialogue and an important element of IP becomes improving the quality of infrastructure, this will expand the budget linked with IP initiatives considerably. Again, part of the difference in emphasis can be traced back to country income levels, with poor infrastructure often the critical bottleneck in low income countries, whilst it is much less so in a middle and lower middle income context. See Box 3 for a summary of recommendations.

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<sup>41</sup> Fundacion Chile, for example, has only ever operated with a very modest budget; see Agosin et al. (2010).

**Box 3 Summary recommendations for donors wishing to support strategic IP**

- Provide support for the institutional framework needed to operationalize IP, including an overarching Deliberation/Competitiveness Council.
- Support or encourage the creation of sub-councils normally based around groupings of firms that produce similar outputs.
- Provide support to help create or strengthen existing business associations.
- Encourage dialogue between associations and government through the framework of these councils and sub-councils.
- Consider funding some of the innovative schemes associated with IP – such as the provision of public inputs required to support new investments, finance for feasibility studies and risk capital for innovative high risk activities.
- Provide technical assistance and consultancy support for sector reviews following best practice methodologies for assessing competitiveness and the binding constraints on growth.
- Train public officials in techniques and data gathering necessary to assess investment priorities and reform at the sector level.
- Review the impact on any ongoing IP and, in particular, its impact on the business environment.

## **Appendix: Choosing between activities**

As a starting point for initial screening for investment possibilities, data at the subsector level can be compiled on:

- Export levels and growth
- Productivity growth
- Domestic resource content.

The intuition here is that new dynamic activities will be found in areas of the economy in which there is already either export success, growth in productivity or a relatively high content of locally available resources. Existing exports give an indication of whether some firms in the subsector have been able to break into international markets and thus reflect existing specialization that could be built on with further investment. Trends in labour productivity can be used as a proxy for dynamic learning effects. Some activities can commence behind protective barriers, however, through the experience of growth within the domestic market, they may reach internationally competitive cost and quality levels. Any dynamism within the domestic market as evidenced by relatively rapid growth in productivity can be an indication of potential efficiency in the longer term. At low levels of industrialization, it is well established that natural resource-based manufactures as identified by the share of local raw materials in total raw materials, play a relatively important role in both the production and export structure. The expectation is that the availability of natural resources provides the potential for resource-based manufacturing to develop competitively, since where natural resources are abundant, their opportunity costs tend to be relatively low. These simple indicators provide a first round screening of where successful activities might be located and can be followed up with more detailed analysis.

### *The Domestic Resource Cost (DRC) indicator and comparative advantage*

The theoretically correct means of assessing the efficiency of the production of goods which can be bought and sold on the world market is to conduct a form of cost benefit analysis (CBA), treating output as an internationally tradable good – as an exportable or import substitute – whose value is determined by its price on the world market. The value of the resources required to produce this output incorporating any external costs or benefits can then be compared with the net foreign exchange value of the output after subtracting the cost of imported or exportable inputs. When this analysis is carried out for an individual project, output and input values must be projected over the project life and discounted back to the present to derive an economic net present value (NPV) and internal rate of return (IRR).



An offshoot of CBA is the DRC indicator which was developed as a means of taking operational planning decisions based on comparative advantage.<sup>42</sup> The DRC indicator can either be calculated on a discounted basis (in which case it becomes equivalent to a standard CBA) or for a single year (in which case it offers a point in time snapshot view of efficiency). At the stage of initial screening, it is rare for detailed project data to be available and the single year DRC offers a simpler form of efficiency analysis for drawing comparisons between different subsectors or branches (say, at the 3 or 4 digit level). For an individual year, this compares the domestic resources required to earn or save a unit of foreign currency with an estimate of the value of that foreign currency to the economy. Put simply:

$$\text{DRC} = \text{DR}/\text{FE}$$

and efficiency requires that  $\text{DR}/\text{FE} < 1$ , where DR refers to domestic resources in domestic currency), FE is net foreign exchange (output minus traded inputs at world prices) converted into domestic currency at the exchange rate that reflects the long-run economic value of foreign currency (often termed the long-run equilibrium exchange rate).<sup>43</sup>

The advantage of the DRC approach is both that it can be used with data for a single year (with an annual capital charge added to operating cost to reflect investment cost) and that it has an intuitively clear interpretation as a project/activity exchange rate that can be compared with an estimate of the long-run value of foreign exchange to the economy. Comparative advantage for an activity requires that the domestic resources involved (normally, specified in terms of labour and non-traded goods), when valued at their opportunity cost, are less than the long-run real value of foreign exchange to the economy, so that efficiency by the DRC criteria becomes an indicator of comparative advantage. Although ranking activities by the size of their DRC is only strictly correct under restrictive assumptions, we can be reasonably confident that activities with ratios well above unity in the formulation above will not be activities in which an economy has a current comparative advantage, so that investment to expand these will be *comparative advantage defying*. Conversely, where the DRC is close to or below unity, the reverse will hold and expansion here will be *comparative advantage conforming*.

The DRC indicator was used in World Bank (2012) to assess the efficiency of a range of light manufacturing subsectors as part of an assessment of options for manufacturing in East Africa. Table 3 gives an illustration of a DRC analysis of the production of a man's cotton shirt. The figures are illustrative, not actual, but they are similar to those used in World Bank

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<sup>42</sup> The DRC indicator was initially used to analyse the efficiency of import substitute activities in Israel and Turkey; see Bruno (1972) and Krueger (1966). Curry and Weiss (2000) have a textbook discussion of CBA and a comparison of the DRC and CBA approaches.

<sup>43</sup> Alternatively, DR and FE can be given in the same foreign currency; Table 3, for example, includes both in US dollars.

(2012), which were derived by surveying a number of firms producing a comparable output and taking a weighted average of revenue and costs from this firm sample.

**Table 3 DRC illustration: Men's cotton shirt production**

Net foreign exchange effect in US \$		Domestic resources converted into US \$	
CIF price import saving from cotton shirts	801795.0	Domestic materials net of taxes	641318.4
<i>Minus</i>		Packaging net of taxes	10812.7
Direct fabric imports at CIF price	69136.0	Labour	92644.7
Electricity (forex component)	482.4	Electricity	723.6
Fuel/water (forex component)	1227.9	Fuel/water	818.6
Annualized capital cost (forex component)	19648.3	Annualized capital cost	11613.9
		Professional services	2881.5
		Repair and maintenance	2365.7
		Administration	21365.8
Net foreign exchange	711300.3	Total domestic resources	784545.0

Notes: Output and imported fabrics are valued at their CIF prices. Domestic resources are at domestic prices net of indirect taxes. Annual capital costs are derived by applying a capital recovery factor (assuming an asset life of 10 years and a 12 percent discount rate) to the replacement value of assets. The foreign exchange content of electricity, fuel and water and capital cost is estimated approximately based on earlier work and is deducted from the world price value of output. Values in the table are given in aggregate monetary terms in US\$ equivalent converted at the prevailing exchange rate. If this rate is taken as reflecting the long-run value of foreign exchange, the DRC is 1.10 (784545/711300.3).

Application of the DRC indicator to test for the efficiency of production rests on the assumption that domestic manufacturing is directly competing with foreign goods, either in the local market as an import substitute or in foreign markets as an export. Where this is the case, prices at the border of the country, CIF or FOB, respectively, provide a measure of

economic value for the commodity.<sup>44</sup> Similarly, imported inputs used in the production of the finished product must be valued at prices at the border and their value deducted from the value of output at border prices to get the net foreign exchange generated by an activity. Determining accurate border or world prices is thus an important empirical part of the analysis. Ideally, they should be collected on a product by product basis through a firm-level survey. This should allow comparable products to be considered and is the first-best approach to the analysis. Where firm surveys are not available, an alternative is to derive data for DRC calculations from aggregate census figures which combine data in subsectors or branches.<sup>45</sup> The value placed on foreign exchange will not affect the ranking by DRC (as it is only applied to one side of the ratio), but will determine the cut-off between efficient and inefficient activities. For practical purposes, what is needed is an estimate of the long-run equilibrium real exchange rate for the economy vis à vis a currency basket, which may differ from the current exchange rate in the foreign exchange market.<sup>46</sup> Given the uncertainty attached to future exchange rates, the sensitivity of the results to alternative exchange rate values can be tested and ‘switching values’ estimated; that is, the exchange rate necessary for an activity to be competitive. Thus, if the key parameter determining the cut-off point for efficiency is inherently uncertain, then DRC estimates must be treated as only approximate indicators of comparative advantage. In World Bank (2012), where activities are found to have a DRC above unity, the results show what combination of domestic productivity improvement and exchange rate adjustment are required to make the activity efficient.

Table 4 reports the DRC results from calculations in Ethiopia for World Bank (2012) using detailed firm-level data aggregated to give a representative firm in each sector. They give a snapshot of efficiency in 2010, the year of the firm survey, but are difficult to interpret because of the wide range of values and the very high economic inefficiency found in two products (wooden chairs and crown cork).<sup>47</sup> The implication is that activities with DRCs of below or not too far above unity are those worth considering for support, where investment will be *comparative advantage conforming*. World Bank (2012) concludes that based on this

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<sup>44</sup> In the case of lower quality local production with respect to imports, there will need to be a downward adjustment to reflect a quality discount, although goods of similar quality need to be compared to the extent possible. Here, we use the terms border and world price interchangeably.

<sup>45</sup> Of the two sources, firm surveys will be considerably more detailed and accurate because specific products, both outputs and inputs, can be identified and reasonably accurate prices established. Surveys also allow firms to be directly asked for data on the replacement cost of their capital assets, which is important for establishing long-run potential in different sub-sectors.

<sup>46</sup> The comparison has to use the same base year prices. There are several techniques that have been used to estimate long-run equilibrium real exchange rates. The best known is to apply a regression model based on economic fundamentals as set out in Edwards (1991). As an illustration, Hobdari (2008) applies this approach to Tanzania, finding a projected real equilibrium appreciation of between 2 percent and 20 percent up to 2012 relative to the baseline, with the key difference being the likely future value of capital inflows.

<sup>47</sup> A negative value is an indicator of extreme inefficiency, as it means there is a net loss of foreign exchange since input costs at world prices exceed output value at world prices. Such activities can only continue to function due to trade protection or other forms of subsidy.

and other evidence, leather goods, agri-business, apparel, metal and wood products in that order are ‘sector priorities.’

**Table 4 Domestic resource cost results: Ethiopia**

Product	DRC indicator
Polo shirts	1.12
Leather loafers	0.78
Wooden chairs	4.16/1.73
Crown cork	-5.76
Wheat milling	1.93
Boxer briefs	Slightly <1.0
Leather gloves	Slightly > 1.0

Source: World Bank (2012), Table 8.4

*Product classification: Sophistication and productivity indices*

DRC calculations can be used to assess current comparative advantage, but do little to shed light on the wide range of new products which countries might move into. Recent literature on the composition of trade at the product level has added to the toolkit of techniques available to give a more dynamic dimension to IP by creating specific indices that aim to approximate the productivity and technology content of individual products. Once DRC analysis has shown an activity to have competitive potential, these new product indices can be used to identify higher value items within a broad product category that can form the basis for product upgrading.

The current pattern of trade and specialization is important for predicting future trends since it is likely that in the short-term, a country will move into the production of goods that require similar skills, technology and capital assets to those in which it is already competitive. There is evidence that within broad product categories (like textiles or clothing), there is significant diversity in terms of technology content and branding, which means that price, profit margins and demand prospects can differ between products. This offers scope for a country to upgrade into higher value segments within a broad product category. There is also some evidence that different patterns of trade specialization have different implications for growth and that exporting higher value products is associated with faster economic growth. For this reason, the desirability of developing countries upgrading their export structures into higher value, technologically more sophisticated products is a widely shared aspiration and the focus of most discussions on IP.

The analysis of trade structure was advanced by the path-breaking work of Sanjaya Lall, which created a taxonomy of products based on a combination of data on their R and D intensity (that is, R and D costs as a proportion of sales value) and personal knowledge of industrial processes, which has been widely used to classify export structure (Lall, 2000). Lall et al. (2006) attempted to differentiate between products at the disaggregate level and to create an index (calculated at the 4 digit level) to capture their sophistication. This sophistication index (SI) was calculated for 766 individual product categories and gives each a unique score by taking a weighted average of the incomes of all exporters of the good concerned with the weights given by their share in total world trade in the good.

The rationale is that within individual product categories, the average income of exporting countries can be a useful proxy for the technological depth of a product; hence, an electrical good from Japan may be deemed to have higher technology content than the same good from the Philippines. Similarly, within apparel products exported by rich countries –or processes undertaken by them – are taken to be more skill, technology or marketing intensive and to yield higher profit margins and wages than the more standardized goods exported by less developed countries.

Independently, Hausmann et al. (2007) applied the same approach, but using a different weighting system.<sup>48</sup> Here, PRODY represents the productivity level of a particular good (calculated at the 6 digit level), but unlike the SI, the weights used are the revealed comparative advantage of each country in the good concerned.<sup>49</sup> The PRODY weighting system has the effect, which is intentional, of giving a higher weight to goods exported from small countries. Hence, in this view, even if the US exports more shirts, say, than Bangladesh, if shirts are a product in which Bangladesh has specialized but the US has not, they should be seen as a low productivity product.

Hausmann et al. (2007) apply their PRODY indicator to total trade of individual countries to calculate an overall measure akin to the sophistication index. What they term the ‘productivity level of an economy’s export basket’, EXPY is a weighted average of PRODY for all commodities with the weights given by their share in a country’s trade. Their focus is on long-term trends and they relate EXPY to growth performance over time and contrast actual EXPY with that expected for an economy’s income level. When they incorporate their productivity of exports measured in a growth analysis, they find that countries with a low productivity export basket grow more slowly when controlling for a range of other factors. Further testing of this result for other samples and time periods is necessary, but it provides

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<sup>48</sup> Weiss (2010) contrasts the two approaches.

<sup>49</sup> Revealed comparative advantage of country x in product y is the share of product y in the total exports of country x, divided by the share of product y in total world exports.

initial confirmation that it is not just openness to trade that is critical for growth prospects, but in addition, the composition of that trade may be just as important.

The implication of this analysis for IP is that it is important to look for ways of raising the technological sophistication and productivity levels of production and exports. There will be many new products which a developing country cannot realistically aspire to produce, so the short-term DRC for these goods will be unacceptably high. The difficulty of moving into a new product is linked directly with the degree of specificity of the assets and capabilities associated with the products in which a country is currently specialized. Where these attributes are either very general – that is, relevant for the production of a wide range of goods – or production conditions are similar in the new products, the transition to a new specialization may be relatively easy. For any economy, there will be some new goods in which it is not currently specialized, which are relatively easy to move into. These are ‘nearby’ products where economic distance is low due to the similarity of the assets and capabilities they require relative to those needed by the economy’s current pattern of specialization.<sup>50</sup>

An important insight of the PRODY and SI indicators are that they reveal that even within what are generally low productivity or unsophisticated groups (like textiles or clothing), there will be some product lines with higher than average PRODY or SI scores whose production may be relatively easy for developing countries to move into. This shift into ‘nearby’ products is a relatively easy way of product upgrading by raising the overall EXPY score for a country and is something to be supported by IP. For example, using US\$ 2006, Table 5 shows that within the HS category 84 for Textiles and Clothing, the PRODY score ranges from US\$ 5316 (HS 8464 Undergarments) to US\$ 11,066 (HS 8482 Other Apparel). The intuitive meaning of the difference in these dollar values is the resources employed in HS 8464, which have a productivity that is less than half the productivity of the resources employed in HS 8482. Hence, there is scope for upgrading production in similar product lines to those in which most developing economies are already operating. The DRC analysis can highlight current comparative advantage at the aggregate level (where DRC is close to or below 1.0) and the PRODY or SI indicator can suggest nearby higher productivity goods that offer potential for upgrading within the broad product category

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<sup>50</sup> The concept of economic distance is developed formally by Hausmann and Klinger (2006) who calculate the probability of countries having a comparative advantage in pairs of products. The higher the probability, the lower the distance between the two products. Countries are advised to balance the desirability of moving into high PRODY goods against the difficulty of moving into distant products. Using their approach, individual product scores can be calculated based on PRODY and a measure of distance as defined above. These scores were used in the discussion of options for export diversification conducted by the Harvard team in both South Africa and Colombia, although given the complexity of the analysis, it is unclear whether it had any impact on policy decisions.

This type of analysis needs to be supplemented by individual market and feasibility studies, but it gives an indication of how a strategy of building on existing comparative advantage might be carried forward.

**Table 5 PRODY estimates for textiles and clothing (US\$ 2006 prices)**

HS category	Product	PRODY
8421	Male outerwear: textile fabrics	8617
8422	Male outerwear: textile fabrics	8245
8423	Male outerwear: textile fabrics	8410
8424	Male outerwear: textile fabrics	9453
8429	Male outerwear: textile fabrics	10699
8431	Female outerwear: textile fabrics	9853
8432	Female outerwear: textile fabrics	6600
8433	Female outerwear: textile fabrics	8205
8434	Female outerwear: textile fabrics	8087
8435	Female outerwear: textile fabrics	8389
8439	Female outerwear: textile fabrics	10,549
8441	Undergarments: textile fabrics	7947
8442	Undergarments: textile fabrics	7956
8443	Undergarments: textile fabrics	6908
8451	Outerwear knitted	15,241
8452	Outerwear knitted	10,657
8459	Outerwear knitted	11,189
8462	Undergarments	10,266
8463	Undergarments	9947
8464	Undergarments	5316

8465	Corsets, garters	12,035
8471	Clothing accessories: textile fabrics	7907
8472	Clothing accessories: knitted	11,180
8481	Apparel: leather	8604
8482	Apparel: other	11,066
8483	Fur clothing	17,808

Source: UNIDO (2011), Table 13

### *Strategic bets*

These product, firm, or subsector level calculations give an insight into actual or potential efficiency and can provide useful data to assist decision-taking on where to allocate funds to support vertical interventions, however, they are unlikely to be adequate in selecting long-run strategic bets.<sup>51</sup> There is a multiplicity of new products which investors may choose to produce, and within this multiplicity of new products initiatives, in the majority of cases, are likely to come from private investors with a familiarity with the industry or technology concerned. In many developing countries, the diaspora may play an important role in developing ideas and providing funds.

Nonetheless, given the success of a number of countries in government-inspired initiatives to transform the production structure, the strategic IP literature does not rule out governments playing a more active role in identifying and championing strategic bets. Ideas can emerge from the high-level deliberations around IP, and government bodies can seek out potential private investors whilst offering tax incentives, infrastructure support and any necessary legislative changes to induce them to invest. Alternatively, governments can use innovation fund schemes as a means of eliciting ideas from the private sector and build on these with joint public-private funding through state-funded venture capital.

In terms of practical operations, the key point here is that strategic bets by their nature involve ‘leaps of faith’ which are not readily converted into precise projections of future revenues and costs, since the products or processes involved will be new to an economy. Existing prices on the world market can be used where comparable products are available and technologies are known, but the newer the activity, the greater the uncertainty about how it can be marketed

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<sup>51</sup> Agosin et al. (2010) point out that salmon farming in Chile would not have been picked up as a nearby product following the methodology of Hausmann and Klinger (2006). Similarly, DRC calculations were not used to justify the important vertical interventions in Japan or Korea in the 1960s and 1970s.



and its costs of production. There are formal techniques to address investment risk, which can give estimates of expected (that is, probability-weighted) returns and the probability of project failure.<sup>52</sup> The strategic IP literature notes this uncertainty and argues that a relatively high failure rate from venture capital schemes is to be expected and that it should not be interpreted as a sign of the failure of IP. What matters is that where funds are spread relatively thinly across a range of new schemes, successes generate sufficient income to offset losses on failures and that where investments have no market prospects, they are allowed to fail.

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<sup>52</sup> See ADB (2002) for an introduction. Risk analysis of this type will be no more accurate than the data which are entered in the model, since its application requires the mean and probability distribution of all values and quantities associated with the investment.

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