Understanding and Escaping Commodity-Dependency: A Global Value Chain Perspective

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Oscar H. Farfan

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Summary

This paper uses the Global Value Chain (GVC) framework to discuss commodity dependency and options for economic upgrading in small developing countries. GVC analysis differs from comparable approaches in that it looks at the dynamics of firms/countries within global production networks and focuses on productive “systems” as opposed to sectors or industries in isolation. Examining global commodity chains through the GVC lenses leads to the conclusion that inserting small developing countries into global markets through commodity exports is not sufficient to sustain real income growth, and may even prove detrimental to their long-term development prospects. Only by virtue of upgrading export industries – which entails moving towards differentiated products with a higher content of technology, skills and innovation – will developing countries be in a position to seize the opportunities brought about by globalization.

Small economies that overrely on primary industries are faced with a host of constraints when attempting to initiate a process of structural upgrading. GVC analysis allows to distinguish between external and internal barriers. At the external or global level, the power dynamics in most commodity chains is shifting against producing countries, as traders, processors and retailers located in consuming markets secure dominant positions. In such asymmetrical power structures, small producers are finding it difficult to move away from low-margin processes and capture some of the downstream value derived from activities such as design, marketing and retailing. Diversifying into industries that are technology-based or skill-intensive, on the other hand, poses more challenging obstacles due to the rapid pace of technological change, the widening technological gap between small and large developing countries, and the path-dependent pattern of technological innovation. At the internal level, small producers are unable to respond to external challenges because of ill-functioning productive systems that lack the scale and coordination capacity required to serve global chains efficiently. In addition, poor framework conditions and the absence of dynamic drivers of industrial growth – including skills, technology and innovation – inhibit to a large extent the emergence of industrial capabilities.

In light of the host of both external and internal barriers to economic upgrading, this paper argues that large developing countries, offering either scale or agglomeration economies, are in a more suitable position to take advantage of development opportunities within a context of rapid globalization. In the case of small developing countries, escaping commodity dependency requires massive, and arguably more autonomous, efforts to break with structural bottlenecks. Such efforts should not be limited to improving framework conditions or gaining market access in rich countries, but must fundamentally, seek to address technical, managerial and coordination problems at the micro level. This, in turn, calls for a re-evaluation of industrial strategies geared towards building local industrial capabilities and enhancing the systemic competitiveness of domestic production chains. The experience of small countries that succeeded in escaping commodity dependency underline the catalytic role of selective supply-side policies, carried out by autonomous public institutions in close coordination with the private sector.
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Introduction

If there is a defining feature distinguishing high from low-income economies today is the technological structure of their production base. With the possible exception of rich oil producers, no country relying on primary commodity exports is to be found in high-income brackets (see exhibit 1). Only those that either moved into skill-intensive and technology-based industries or incorporated value-adding processes into their primary sectors were able to achieve higher income levels. There are however over 65 countries today that still rely on primary commodities for more than 50% of their export earnings (Bonaglia and Fukasaku, 2003). The majority of them continue to struggle in poverty in spite of their systematic insertion into the global economy through export markets. This paper will discuss the different challenges and opportunities these countries face in today’s dynamic global complex. The discussion will evolve around three main dimensions: (i) the implications of commodity-dependency for overall socioeconomic development; (ii) the underlying factors explaining commodity dependency; and (iii) workable avenues to address the commodity problem.

Exhibit 1: Commodity Dependency and Income Levels

For the purpose of this study, primary commodities will be defined as unprocessed or low-processed products based on non-oil natural resources, akin to the classification introduced by Wood and Mayer (1998). Commodity dependency will therefore underline the absence of “value-added” in the productive base. Accordingly, small commodity-dependant economies (CDEs from now on) will be those inserted into global markets through primary products bearing little value relative to final consumption goods.

1 Standard International Trade Classification (SITC) categories include 0 (food and live animals), 1 (beverages and tobacco), 2 (Raw materials, inedible, except fuels), 3 (Mineral fuels, lubricants and related materials), 4 (Animal and vegetable oils and fats), plus a few items in groups 5 (522.24, 522.56, 524), 6 (667, less 667.29, and 68) and 9 (941, 971). See Wood and Mayer (1998) for details.
The paper is organized in seven sections. Section 1 presents theoretical views on commodity-dependency and its implications for long-term development. Section 2 draws upon the Global Value Chain framework to examine key competitive factors explaining commodity dependency. Section 3 infers on how the “China phenomenon” will either hamper or create opportunities for CDEs to move away from commodity trade. Section 4 discusses the role of public policies and industrial strategies in catalyzing economic upgrading. The final section presents five case studies of successful upgrading experiences.

1. Primary Commodities and Development

Economic development can be conceived as the process of moving from a set of assets based on primary products to one based on skills, technology and knowledge (Amsden, 2001). This has been the evolution pattern of today’s developed countries, and most recently, newly industrialized economies in East Asia. While primary commodities can provide a bedrock for development – as in the cases of Australia, Finland, Canada and even the United States –, it is the shift to higher-value-added activities through technological transformation, which will arguably make such process sustainable. The question remains whether this shift is workable for a large number of small CDEs, struggling today in a highly competitive global economy. The historical underperformance of most CDEs seems to suggest that relative resource abundance may not necessarily lead to higher development but to some kind of “commodity trap”. The arguments supporting this view see commodity dependency as self-perpetuating due to three negative byproducts: (i) terms of trade deterioration; (ii) negative externalities and; (iii) institutional and sociopolitical weaknesses.

1.1 The Terms of Trade Argument

Probably the earliest systematic attempt to study the negative implications of commodity-dependency for development was that of Prebisch and Singer from the Structuralist School. Their thesis developed in the post-depression era, sustained that real income growth in CDEs is largely constrained by the long-term structural tendency of commodity prices to decline relative to manufacturing goods. This loss of relative purchasing power or “terms of trade deterioration” was, in turn, the result of four major drivers: (i) low price and income elasticities of world demand for primary commodities; (ii) continuous technological progress that economizes on the use of primary raw materials; (iii) technological superiority and the control exercised by developed countries over sophisticated manufacturing technology; and (iv) monopolistic structures in developed markets contrasting with competitive structures in commodity markets (Athukorala, 2000). Against these conditions, CDEs are prone to declining relative income, which can largely constrain long-term development.

Nearly six decades after the introduction of Prebisch and Singer’s model, some of its underlying principles are still relevant for explaining the biased nature of technological progress and uneven development performance across developing countries (Katz, 2004). In fact, terms of trade in most CDEs have been eroding more rapidly, largely as a result of world oversupply following the recent waive of economic liberalizations (Athukorala, 2000). As it can be seen in exhibit 2, the RBA index of commodity prices reveals a declining and volatile trend in the past two decades; Agricultural prices have experienced the most dramatic falls with raw materials and food products dropping 60% and 70% respectively in the same period (Greenfield, 2004). The declining trend of commodity prices has been reverted in recent years, largely as a result of China’s growing demand for raw materials.

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2 Index constructed by the Reserve Bank of Australia, on the basis of a composite of agricultural and non-agricultural commodities.
Whether this pattern is sustainable and offers workable upgrading opportunities for CDEs will be discussed in section 3.

Exhibit 2: RBA Commodity Price Index

Source: Author based on RBA database.

1.2 The Externality Argument

Arguably, the greatest risk of commodity trade is not economic volatility or limited potential to sustain income growth relative to manufacturing. More fundamental for development, commodity dependency may inhibit the emergence of other more dynamic sources of productivity growth such as human capital, technology, innovation and organizational capabilities. Singer himself sustained that resource industries are less able to stimulate human capital formation, technological learning and domestic demand, which are critical for catalyzing a shift into high-value-added manufacturing (Bravo-Ortega, et. al. 2003 and Singer, 1950). Similarly, Maloney (2002) argues that primary industries in regions such as Latin America have failed to encourage human capital formation and scientific infrastructure. Along the same lines, Evans (2004) argues that primary industries are unlikely to uphold a process of rapid economic transformation because only technology-based activities today are capable of spurring the kind of entrepreneurial energies and spillover effects necessary for a “multidimensional conspiracy in favor of development”. A complementary interpretation of why commodity dependence may delay industrialization is that of the Dutch Disease phenomenon, which predicts that a concentration of economic activity in the resource sector will distort the capital and currency markets in such a way that financial and human resources will drain away from manufacturing and move into the resource sector (Sarraf and Jiwanji, 2002).

1.3 The Institutional Argument

Dependency on primary commodities has often been associated with low institutional development and sociopolitical instability. Sachs and Warner (1997) conclude that resource-abundant countries tend to be more prone to rent-seeking and develop poor government institutions. Leamer and Schott (1999) and Amsden (2001), on the other hand, have found resource-abundance to be correlated with high levels of income inequality, and hence higher risk of sociopolitical instability. Unstable framework conditions, in turn, can largely deter investments in activities other than the resource sector and reduce overall growth prospects (exhibit 3).
In summary, primary commodities offer a weak platform for sustainable development. Not only they present limited opportunities for income growth, but can potentially prevent the development of other more dynamic economic activities and institutions. The challenge for CDEs, therefore, is to avoid an insertion into the global economy based on commodity trade and seek to upgrade into differentiated products with a higher content of technology, skills and innovation. The main constraints they face in moving into this direction will be discussed in the following section.

Exhibit 3: Economic Growth and Commodity Exports

![GDP pc - growth rate (1970-1993)](chart)

Source: Author based on Andersen and Faris (2002:3) and Lall (2005:5).

2. Understanding Commodity Dependency from a Global Value Chain Perspective

Understanding commodity dependency is not a straightforward exercise and requires to look upon country-specific factors. While most commodity markets share common structural characteristics that allow for some degree of generalization, the purpose of this section is not to provide a “one-size-fits-all” interpretation but to pinpoint common structural drivers explaining commodity-dependency. In an increasingly integrated yet fragmented global economy, this will demand not only to look at internal competitive constraints affecting producing countries but also external factors influencing the flows of international trade as well as the global configuration of the industries in which they connect. By linking both such spheres in a systemic approach, the Global Value Chain (GVC) framework developed by Gereffi (1994, 1995) becomes a valuable tool for discussing the commodity problem. GVC analysis dissects the full range of cross-border activities involved in the process of bringing products from conception to final consumption, with the aim of examining three fundamental dimensions (Gereffi, 1995): (i) the input-output structure of an industry and its global configuration; (ii) the governance pattern determining the power dynamics between different players
and hence the distribution of income within the chain; and (iii) the institutional framework influencing the flow of technology and information across different nodes. The framework, therefore, allows to understand the underlying factors determining the ability of certain players/countries to capture the value generated within a particular global chain. By adopting a systemic view, GVC analysis also allows to examine the dynamic linkages between different productive activities, sectors and policies, bringing to the fore systemic bottlenecks that may be preventing countries from moving away from commodity trade.

A simplified model of a global value chain is illustrated in exhibit 4, which describes the different nodes and geographical linkages at different stages of processing. For the purpose of identifying the major drivers of commodity dependency, the different dimensions of GVC analysis will be used to examine three sets of constraints: (i) competitive barriers in “downstream” nodes such as trading, marketing and retailing, dominated by global firms in developed countries; (ii) competitive bottlenecks in “upstream” nodes such as extraction and basic processing, located in producing countries and (iii) systemic hurdles in the overall national environment of producing countries.

2.1 External or Downstream Constraints

CDEs seeking to upgrade into higher-value-added activities or diversify into non-commodity sectors are externally constrained by three factors: (i) an increasingly asymmetrical GVC governance pattern; (ii) adverse trade distortions; and (iii) high entry barriers to non-commodity industries.

_Governance shift_—Firms exerting the “governing function” in a GVC are those that, by erecting high entry barriers around their core activities, are able to capture a high share of value and coordinate the flow of critical market and technological information within the chain. The type of governance will determine the extent to which CDEs are able to upgrade and can hence be regarded
as the “shaping force of development” (Petkova, 2005). In the case of most agriculture-based commodity chains, governance structures have shaped into highly asymmetrical “buyer-driven” forms, where downstream players such as distributors and retailers located in developed markets have increased their bargaining power vis-à-vis producers. As a result, CDEs have been systematically reducing their share of value added generated within the chain and becoming more dependant on external lead players for accessing consuming markets. Exhibit 5 shows an example of this dynamic in the global coffee chain.

Exhibit 5: Distribution of Value in the Global Coffee Chain (% of income)

The growing market power of downstream players is the first clue to understanding the inability of CDEs to move into high-value-added activities such as distribution, marketing and retailing. Lead players in commodity chains have secured dominant positions as a result of four major strategic developments. The first is consolidation, especially among retailers and distributors. In horticultural chains for example, global trade is increasingly dominated by a smaller number of “northern supermarket” (Gibbon, 2000). In the coffee industry, 40% of global trade is controlled by 4 trading houses and 45% of the retail market dominated by only 3 roasters (Oxfam, 2002). Conversely, producers have become more fragmented, largely as a result of the systematic dismantling of international commodity associations and the entry of new suppliers following the wave of market liberalizations in the 1980s and 1990s (Gibbon, 2002).

Another factor contributing to the growing market power of downstream players – particularly distributors – has been increased supply chain coordination capabilities. In many commodity chains, international trading houses have been adopting modern supply systems such as just-in-time delivery and are able to offer retailers a consistent quality at less volatile prices. These capabilities derive from the ability of international distributors to accumulate large volumes from different sources, invest in sophisticated inventory management systems and exert complex hedging options in financial markets (Gibbon, 2002). Trading houses have become a key link between producers and retailers, and in some cases exert the governing function within the global value chain. Coordination between distributors and producers, however, do not always create upgrading opportunities for the latter, as it tends to be loose and indirect, based primarily on arms-and-lengths transaction (Ibid). In addition, when international distributors hold less market power than retailers – as it is increasingly the case in most commodity chains – they tend to seek higher profitability by depressing upstream prices, hence affecting profit margins in producing countries (Petkova, 2005).

A third source of market power specific to retailers is *branding*, which nowadays plays an overriding role in reaching consumers. CDEs seeking to export to developed markets are increasingly reliant upon brands dominated by global lead firms. Branding is arguably one of the most diffuse and difficult barriers to overcome, and because it stems from market knowledge, it is almost exclusive to downstream players. Moreover, as global outsourcing enables lead firms to concentrate on their core competencies—namely marketing-related activities including branding—the barriers to entering such segments are arguably rising. Market knowledge has also become critical for succeeding in other value-adding activities such as distribution and supply chain management (Memedovic, 2004).

A final driver explaining the governance shift in favor of downstream players is technological *innovation* on the use of primary raw materials. In the case of the coffee industry, for example, roasting techniques have evolved into flexible processes that combine different varieties of species in order to obtain a standard quality. Roasters, therefore, have become less dependent on single producers, hence increasing their bargaining power within the chain. Exhibit 5 summarizes the different forces reshaping the governance pattern in most commodity chains.

**Exhibit 6: Main Drivers of the Governance Shift in Global Commodity Chains**

*Trade-related constraints*—Aside from the governance shift observed in commodity chains, a second clue to understanding commodity dependency lies in the dynamics of international trade. While increased trade can bring about efficiency gains by virtue of nudging producers to specialize according to their factor endowments, it can potentially exacerbate commodity dependency if comparative advantage remains static (Chang, 2001 and Lall, 2003). Dynamic benefits of international specialization and trade can be null for countries failing to either create or attract the capabilities necessary to move into activities offering opportunities for upgrading and technological development (Lall et al, 2004). A sub-optimal pattern of specialization can emerge in the absence of dynamic internal competitive factors, but can also be pushed by trade distortions that inhibit value-adding processes in developing countries. Such is the case of the post-Uruguay-Round international *tariff system*, whereby import tariffs in developed markets were set on a progressive basis according to
the stage of processing (exhibit 6). In addition to the tax bias against value-added, high *agricultural subsidies* in major developed markets also contribute to the erosion of profit margins in many CDEs.

**Exhibit 7: Escalating Tariffs on Value Added**

<table>
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<tr>
<th>Product Type</th>
<th>US</th>
<th>EU</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raw cocoa</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Semi-processed cocoa</td>
<td>0.2</td>
<td>0.5</td>
<td>0.2</td>
</tr>
<tr>
<td>Processed cocoa</td>
<td>15.3</td>
<td>21.7</td>
<td>30.6</td>
</tr>
<tr>
<td>Processed coffee</td>
<td>7.3</td>
<td>12.1</td>
<td>18.8</td>
</tr>
<tr>
<td>Coffee beans</td>
<td>6</td>
<td>10.1</td>
<td>18.8</td>
</tr>
</tbody>
</table>

*Source: Author based on UNCTAD (2003:22)*

**Entry barriers to non-commodity industries**—The discussion so far has dealt with external factors preventing CDEs from moving into higher-value activities within commodity chains – also known as functional and product upgrading (Kaplinsky and Morris, 2000). CDEs can also break away from the commodity trap by diversifying into non-commodity industries – also known as intersectoral or value chain upgrading (Ibid). Arguably, non-commodity industries that are technology-based and skill-intensive provide a more desirable platform for development, not only because they offer better growth opportunities but also for the positive externalities and spillover effects they create (Evans, 2004). Entering such industries, however, is becoming increasingly difficult for small developing countries lacking “initial” industrial capabilities. New comers bear high entry barriers and face greater bottlenecks, mostly derived from market imperfections (Shapiro and Taylor, 1990). Two of the most critical barriers are *economies of agglomeration* and *path-dependency*. Economies of agglomeration underline the tendency of technological learning and innovation to concentrate on a reduced number of countries that “agglomerate” a set of technology-related capabilities (Lall, 2003). Path-dependency refers to the tendency of technological innovation to build upon existing capabilities, which also takes place in “agglomerated” clusters. Because of this dynamic, technologically advanced countries tend to accumulate higher levels of investment and technological learning, while latecomers fall further behind. As the technological gap widens, latecomers find themselves with reduced catch-up opportunities and increasingly locked in as commodity producers. The biased nature of technological progress explains to a large extent the inability of many CDEs to break away from commodity dependency as well as the growing income disparities observed between developed and developing countries (Ibid).

Agglomeration and path-dependency are not the only external constraints against the diversification of CDEs into technology-intensive sectors. *Foreign Direct Investment* (FDI), which has been at the heart of rapid technological learning in East Asia, is becoming less of a catalytic force in most CDEs. First,
FDI flows are increasingly concentrated on a reduced number of countries offering either economies of scale or economies of agglomeration. Second, much of FDI is not being directed to export-oriented manufacturing and thus not leading to higher levels of technological learning and industrial competitiveness. Lall et al (2004), for examples, observe that the large bulk of recent FDI in Latin America prompted by the wave of privatizations has been directed to services rather than manufacturing. Moreover, with the exception of Mexico and Costa Rica, much of the manufacturing FDI has not been allocated into the kind of export-oriented activities that enabled Asian economies to integrate into dynamic global production networks (Lall et al, 2004). Similarly for Africa, Lall (2005) finds that, in spite of increasing interest of foreign investors in the region, much of the FDI has been of the “resource-seeking” type and not directed to labor-intensive industries. Even when CDEs are able to attract FDI into the manufacturing sector, technology and knowledge transfers have become less dynamic, largely because, in the context of falling trade barriers, Multinational Corporations (MNCs) have higher flexibility to outsource manufacturing processes while retaining control over key technological and know-how capabilities. As a result, CDEs attracting manufacturing FDI may find it difficult to move beyond assembling functions and become fully-fledged manufacturers (Katz, 2004). This is why some argue that opportunities for technological learning in CDEs are becoming more contingent upon “autonomous” efforts to build initial local capabilities and direct FDI into more sophisticated activities (Memedovic, 2004).

2.2 Firm-level or Upstream Constraints

Commodity dependency is not only explained by external factors inherent to the configuration of global value chains. Even in the absence of external barriers, CDEs still face internal competitive bottlenecks preventing firms from moving into higher-value-added activities or diversifying into technology-based sectors. The most important constraints commonly found in CDEs at the firm-level are: (i) small size and low inter-firm coordination; (ii) low technology and innovation capacity (iii) deficient local supply chains; and (iv) low entrepreneurial drive.

Firm size and coordination—Achieving economies of scale either through upscaling or inter-firm coordination is increasingly important for the upgrading prospects of CDEs. First, a minimal scale capacity is required to buffer key upgrading investments in technology and knowledge-based assets. Some of these investments include modern supply chain management systems, sophisticated quality control processes and international certifications, which are today necessary for serving global markets efficiently. Second, firm size has become critical when attempting to establish commercial ties with global lead firms, nowadays preferring to rationalize chain transactions by working with a reduced number of large “preferred suppliers” (Amsden, 2002, and Gibbon, 2002). Establishing long-term linkages with lead firms, in turn, opens up opportunities for producers to attract more complex functions and upgrade into higher-value-added activities (Dolan et al 2000). Third, for CDEs seeking to diversify into non-commodity sectors, the most workable opportunities are likely to be found in mature industries with thin profit margins, where rents are even more contingent upon the leveraging of economies of scale (Amsden, 2002).

The catalytic role of upscaling in economic upgrading has been widely discussed in the literature. Amsden (2002) has stressed the role of large conglomerates in Korea and that of coordinated networks in Taiwan in achieving the scale necessary for efficient manufacturing processes. Along the same lines, Gwynne (2004) argues that firm concentration has been key in Mexico’s industrial diversification into sectors such as beer, baking, nonferrous metals and auto parts. In the case of agriculture-based commodities, Gibbon (2002) finds that successful firms in Africa were able to upgrade into processed products after turning smallholders into large-scale farming. Similarly, when discussing the export success of agro-industry and fish processing in Chile, Gwynne (2004) highlights the role of collective scale achieved by networks of small farmers coordinated in most cases by a
large export company. At the other end, firms lacking scale capacity are only able to link to global markets through arms-and-lengths transaction subject to substantial risk discounts. This is the case, for example, of the large majority of coffee producers across developing countries, with average farm size not exceeding 5 hectares (Oxfam, 2002). Within this particular industry, even profitable niches such as gourmet and fair-trade coffee – long believed to be suited for small farming – are increasingly reliant on economies of scale, and hence firm size, to buffer the high costs of certification and quality control (Ponte, 2002).

Technological capacity and innovation—A second major competitive weakness found at the firm-level in most CDEs is lack of technological capacity and innovation. Enterprises in CDEs are usually passive with regards to investing in technology and research and development (R&D). This can be explained to a large extent by the absence of economies of scale to buffer large investment costs. Even with a reasonable size, however, firms may not be willing to embark upon technology upgrading or invest in expanding their innovation capacity because of risk aversion and uncertain appropriability. As discussed before, in countries with unstable economic environments and where rents can be secured in the commodity sector, private actors may hesitate to internalize investment risks as they are uncertain to secure the flows of future benefits (Altenburg and Meyer-Stamer, 1999).

Supply chain deficiencies—Another constraint commonly found in small CDEs is deficient and incomplete local supply chains. Many CDEs have poor or ill-articulated input-output structures, characterized by weak backward and forward linkages, underdeveloped supporting industries and the absence of value-adding players at the downstream level. Incomplete and loosely integrated internal structures are less capable of creating the kind of agglomeration benefits necessary for production systems to work efficiently, let alone upholding a process of industrial upgrading (Wade, 2004). Supply chains tend to be weak and incomplete in CDEs largely because commodity industries create negligible linkages with other sectors and hence have little potential to stimulate vertical and horizontal activities. Leamer and Schott (1999), for example, observe that resource-dependant economies are less likely to stimulate value-adding activities because they generally fail to accumulate a “specialized pool of skills” and financial markets evolve unsuited to channel capital to “high-risk” manufacturing ventures or other horizontal activities such as education. Financial intermediation for non-commodity activities tends to be weak and costly due to Dutch Disease and because commodity markets are inherently volatile and hence drive up the overall capital risk in the country (Ibid).

Entrepreneurial drive—A final firm-level constraint frequently found in CDEs is lack of entrepreneurial drive. While explaining entrepreneurship is a complex exercise requiring to look upon cultural, historical and institutional factors, much can be inferred by examining the system of incentives influencing private sector behavior. In the case of CDEs, where economic rents derive from resource industries, low entrepreneurial drive could be explained by the difficulty of “socializing” the risks and “appropriating” the benefits of investing in non-resource activities. In other words, shifting to manufacturing activities entails entrepreneurial risks not likely to be taken by private individuals who can otherwise secure some rents in the resource sector (Chang, 2001). Entrepreneurship in other cases may have been suppressed by “paternalistic” governments inhibiting the emergence of dynamic private sectors (Fairbanks and Lindsay, 2000). Low entrepreneurial drive can also be conceived as a byproduct of income inequality; Amsden (2001) claims that the high concentration of income in powerful agricultural families explains to a large degree the lack of manufacturing entrepreneurship in regions such as Latin America. This is simply because the owners of capital – i.e. agricultural families – enjoy comfortable positions in commodity industries and are therefore hesitant to embark upon high-risk manufacturing ventures.
2.3 Framework Conditions and Structural Factors

In addition to downstream and upstream factors, the conditions influencing the environment in which domestic firms operate will determine to a large extent their ability to move away from commodity trade. At this level, CDEs are usually faced with three sets of constraints: (i) unfavorable framework conditions; (ii) lack of dynamic structural drivers of industrial performance; and (iii) an unsupportive policy framework.

Framework conditions—The overall investment climate is determined by framework conditions grouping three main dimensions: economic stability, public governance and sociopolitical stability. Economic stability has always been a concern in most CDEs that have traditionally exhibited high rates of inflation and volatile currencies. In the past two decades, however, the emphasis on responsible macroeconomic management under structural-adjustment programs has led to a restoration of economic stability in a large number of CDEs. On the other hand, public governance – which encompasses government effectiveness, control of corruption, the rule of law and regulatory quality – remains largely deficient in CDEs. Poor governance in general and burdensome government regulations in particular tend to prod firms into informality (Palmade, 2004) excluding them from capital and export markets, as well as from other institutional arrangements that encourage innovation, efficiency and economies of scale (IFC, 2001). Not surprisingly, most informal enterprises show negligible productivity growth (McKinsey, 2004), while formal enterprises are found to generate greater value-added (IFC, 2001). Moreover, as informal firms grow in number, there are fewer incentives for formal firms facing “unfair” competition to emerge (McKinsey, 2004). Sociopolitical instability is also a recurrent problem deteriorating both investment and operational environments in CDEs. Political instability is often associated with high income inequality and low public governance, which as discussed previously, are common byproducts of commodity-dependency (Leamer and Schott, 1999 and Sachs and Warner, 1997).

Structural drivers of industrial performance—CDEs unable to upgrade are usually deficient in one or more of the three structural drivers determining industrial performance (Lall et al, 2004). The first is skills, more specifically, tertiary education in fields such as science, mathematics, computing and engineering, nowadays considered critical for handling modern technology and supporting industrial development. Most CDEs still show negligible tertiary enrollment rates; Africa presents the world’s lowest levels while Latin America still falls far behind East Asia (Lall et al, 2004 and Lall, 2005). Not only tertiary enrollment is low, but the overall quality of education is also poor, especially in CDEs characterized by seniority-based education systems with little coordination between public supply and private demands for human capital formation (Katz, 2004 and Lall, 2003).

A second industrial driver found to be weak in CDEs is technological effort, which refers to domestic investment in R&D and science and technology. According to the Technological Effort Index developed by Lall (2005), most of Latin America and Africa still register “low” or “negligible” levels. Not only technological effort is low but the little that is produced is generally underutilized due to the lack of coordination between universities, research centers and the productive sector (Lall et al, 2004). In other cases – most notably in Latin America – firms have abandoned “in-house” R&D efforts and engineering activities as falling trade barriers have allowed them to import capital goods more easily (Katz, 2004). While technology imports have catalyzed upgrading in some cases, it has also reduced to a large extent the scope of technological innovation, making firms increasingly dependent on imported technology. As a result, CDEs moving into manufacturing often become “assemblers” as opposed to fully-fledged and innovation-based industries (Ibid).

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4 As defined by the World Bank’s Governance Indicators.
A final driver of industrial growth that is deficient in CDEs is *infrastructure*, which not only includes transportation but also information and communication technologies. A well-integrated and operational transportation system plays a critical role for industrial performance, not only because it improves operational efficiency, but also because it facilitates national integration and hence more articulated input-output structures. Information and communication technologies, on the other hand, are becoming increasingly important for leveraging competitiveness in virtually all industries (Lall et al, 2004).

**Policy framework**—There is growing consensus on that economic policies in CDEs are failing to provide a workable avenue for structural transformation and hence may be contributing to perpetuating commodity dependency. In many cases, orthodox neoliberal policies have shielded policy makers away from active intervention to address structural competitive barriers and invest in human capital and technological capabilities (Katz, 2004). Other traditional industrial policy instruments such as subsidies and tariffs, used extensively during the early stages of today’s industrialized economies including the East Asian Tigers, are no longer available under the prevailing international trade system (Lall et al, 2004, and Chang, 2001).

The “Commodity Trap Clock” shown in exhibit 8 summarizes the different downstream, upstream and environmental barriers preventing CDEs from breaking away from commodity dependency. Appendix 1 also includes a cross-country view on the relationship between commodity-dependency and some of the structural drivers discussed in this section.
3. The China Factor: Opportunities and Challenges

China has undergone the most rapid and dynamic transformation ever experienced by a developing country. Its economy has grown at an average of 9% since 1978, reaching rates as high as 12% in the early 90s (IADB, 2005). At this pace, some analysts have predicted that by 2050 China will become the single largest economy with a 28% share of world production, surpassing the European Union (15%) and the US (26%) (Engardio, 2005). This vigorous growth together with a large degree of industrial diversification and continuous technological improvement is reshaping the global economy and creating both opportunities and threats for all players. In the case of CDEs, the major opportunity stems from the demand pull the growing Chinese market is creating for commodity exports. The threat is of rather structural nature and may affect the development prospects of CDEs in the long run; China’s expansion is arguably narrowing the scope of industrial diversification for other developing countries and may nudge CDEs into a sub-optimal specialization pattern that perpetuates commodity dependency.

3.1 The Demand Pull

Most CDEs see China as a growing market absorbing increasingly larger volumes of primary goods and exerting an upward pressure on world commodity prices. China, therefore, presents itself not as a direct competitor but rather as a complementary economy to which CDEs can supply and boost export revenues. Indeed, the relatively balanced trade China maintains with the “Group of 48” – comprising the world’s least developed economies – underlines the rapid penetration of primary commodities into the Chinese market (Shenkar, 2005). South American countries are among the primary beneficiaries of China’s growing appetite for commodities. Exports from Argentina’s to China, for example, have increased from $189 million to $2.5 billion between 1980 and 2003 (IADB, 2005). Brazil’s sales to China as a percentage of total exports have tripled between 2000 and 2004. The same figure in Chile has increased from 0.4% to 9% between 1990 and 2003 (Ibid).

Increased export revenues stemming from China’s growing consumption of raw materials can greatly enhance growth prospects in CDEs, at least until commodity prices converge again to a declining trend, either due to an economic landing in China or the low elasticity of demand characteristic of commodity markets. Another benefit for CDEs derived from the Chinese demand pull is increased inflows of FDI targeting resource industries, with China itself becoming a major provider (IADB, 2005). The foothold CDEs establish in the Chinese market coupled with higher export revenues and larger FDI inflows may provide opportunities for moving towards higher-value-added activities through product and functional upgrading.

3.2 Increased Dependency

On the negative side, China’s economic expansion can potentially drive CDEs into a sub-optimal commodity-based specialization pattern, and hence prevent them from moving into manufacturing activities. A close look at recent trade patterns reveals that China’s technological upgrading has contrasted with a technological downgrading in regions such as Latin America and Sub-Saharan Africa, which have systematically been losing their shares of global manufacturing value added and manufacturing exports, while increasing their reliance on resource-based products (exhibit 9). This trend underlines the strong bias of CDEs toward primary commodities and increasingly away from manufacturing activities, suggesting a downgrading of comparative advantage that may prove damaging to their long-term development prospects.
China’s growing demand for raw materials may not only exacerbate commodity dependency by prodding CDEs to specialize even more on commodity exports, but may also increase economic vulnerability if CDEs become overdependant on the Chinese market. Although China emerges nowadays as an “alternative market”, its size and growth cannot be overestimated. Some CDEs may in the future find themselves locked into the Chinese market, especially if they adapt products to Chinese standards, which can potentially backfire as an exit barrier increasing China’s bargaining power vis-à-vis producers. Moreover, the external constraints that currently prevent CDEs from moving into high value-added nodes within commodity chains are also likely to emerge in China. In-market players such as retailers and trading houses can be encouraged to consolidate in order to achieve the scale and coordination capabilities necessary to serve such a vast market. This may enable Chinese-based companies to retain profitable segments such as supply chain management, marketing and retailing, while relegating CDEs to low-value activities.

3.3 Narrow Scope for Upgrading

The greatest threat for CDEs posed by China’s escalating role in the global economy comes in the form of narrowing opportunities for sectoral or value chain upgrading. That is, less space to move into non-resource industries based on skills and knowledge, which arguably provide a better platform for development. China manufacturing dominance can be seen in an increasingly wider variety of skill-intensive and gradually technology-based industries that range form apparel to consumer electronics. Chinese products or components are found in almost every major industry today (Shenkar, 2005) and their pace of penetration is likely to continue growing at the expense of other developing countries (Lall et al, 2004). To take the wooden furniture industry in the US as an example, Chinese exports have rose 75% between 2000 and 2002, overtaking the entire range of segments from low to high-end products (Shenkar, 2005). In the case of apparel and textiles, Chinese penetration to the US is projected to increase from 13% to 71% by 2006, once quotas set under the Multi-Fiber Agreement are effectively removed (ibid). This will have a significant impact in countries where these industries play an overriding role in industrial growth and employment generation. The most vulnerable are small developing countries unable to redeploy resource into other sectors. Apparel and textiles, for example, account for 86% of total exports in Bangladesh, 83% in Haiti, 63% in Honduras, and 94% in Lesotho (ibid).
CDEs can hope to take on mature industries as China moves up the technological ladder, akin to the development pattern followed by other Asian nations such as Japan and Korea. China, however, is defying common assumptions on international product cycles based on evolving comparative advantage and is likely to sustain its dominance in labor-intensive industries even as it moves up to more sophisticated products (Shenkar, 2005). This is due to the coexistence of increasingly abundant skilled workers with a large pool of still untapped cheap labor in relatively underdeveloped rural areas. China is also building upon an array of new capabilities that are beyond low labor costs. A combination of modern infrastructure, supporting industries, scale and agglomeration economies, favorable investment climate, and a broad international diaspora from which to leverage, is creating the conditions for turning China into the “factory of the world” (ibid). China’s manufacturing capabilities are also consistent with new business models starting to emerge in major consuming markets. In the retail landscape, for example, the US and increasingly Europe are becoming dominated by large chains competing on the basis of price, speed to market and promotional seasons. This requires suppliers not only to provide low prices but also massive production capacity, shorter lead times and quality consistency, which are competencies only China and other large middle-income countries can hope to leverage. Against this background, the spaces for industrial diversification in CDEs are increasingly narrow and, at best, limited to thin niches. In the case of Latin America, for example, Montague Lord International finds only four sectors in which the region may have a competitive edge vis-à-vis Asia: leather, footwear, fertilizers, and non-metallic minerals (Gwynne, 2004).

4. Getting Out of the Commodity Trap

The GVC framework has been used to discuss the main drivers of commodity dependency as well as the likely impact of the growing Chinese economy for CDEs. The analysis so far has centered in examining competitive constraints and pinpointing critical bottlenecks to economic upgrading. This section will take a step forward and make use of the GVC concept to discuss policy options aimed at creating conditions for structural transformation. Before embarking on such exercise, it is important to first recapitulate four key implications derived from assessing the dynamics of commodity chains through the lenses of the GVC framework.

i. Linking commodity producers to global value chains is a necessary but not sufficient condition for economic development. Only when CDEs break away from commodity trade and embrace technology-based and skill-intensive processes, will they be able to achieve sustained income growth. Continuous reliance on commodity exports in a context of increased globalization and rapid technological change will most likely drive CDEs into a path of “immiserizing growth” where international competitiveness is maintained through a “race to the bottom”.

ii. Most commodity chains – particularly agriculture-based – are increasingly becoming “buyer-driven”, with downstream players such as distributors and retailers capturing the highest share of value-added and controlling the flow of technology and knowledge along the chain. Upgrading opportunities in CDEs are, therefore, contingent upon the linkages they create with global lead firms exerting the governing function, which entails moving beyond arms-and-lengths-types of transactions. GVC governance has therefore become the “shaping force of development”.

iii. When devising intersectoral upgrading opportunities (diversifying into technology-based industries), CDEs are largely limited by the growing manufacturing dominance of China, which is narrowing spaces for industrial diversification. China’s expansion is creating, nevertheless, a demand-pull that improves price conditions in commodity markets. Against
this background, the best upgrading opportunities in CDEs are to be found in the further processing of their comparative advantage sectors, namely resource-based industries. This includes process, product and eventually functional upgrading. The latter referring to the shift to intangible activities yielding higher value such as marketing, design and branding. Because of the better growth and learning opportunities they present, however, CDEs should actively seek windows of opportunities for diversifying into non-resource technology-intensive industries.

iv. Due to the array of market imperfections and structural constraints inhibiting technological change in most CDEs, upgrading into higher value-added activities or technology-intensive industries will not take place spontaneously. Autonomous efforts led in tandem by frontline enterprises and the government, are therefore paramount for galvanizing economic upgrading.

While the need of some form of intervention to initiate structural transformation is clear in the case of CDEs, finding an effective mix of policies is increasingly challenging. Active industrial policy, including the use of subsidies and tariffs are no longer feasible under today’s international trade rules. The failure of past “interventionist” approaches in many developing countries is also a recurrent reminder of the potential risks associated with ill-conceived or incomplete industrial strategies, especially within a context of poor institutional development and weak governance. Against these conditions, upgrading policies are most likely to work if built upon alternative and innovative forms of intervention. The following segments will discuss potential areas of supply-side public involvement.

4.1 Addressing External or Downstream Constraints

External constraints for upgrading, deriving mainly from highly asymmetrical governance structures, trade distortions and barriers to technological learning, are arguable the most difficult to address from a national standpoint. Governments, however, can play a critical role, first as intermediaries facilitating beyond-arms-and-lengths linkages of local producers with global lead firms. Such linkages can be created through aggressive FDI targeting strategies. Most fundamental for upgrading, however, is the government role in directing FDI into complex and higher value-added activities that allow for industrial learning to take place within national boundaries. Evidence suggests that dynamic gains from FDI in the form of technology and knowledge transfers work better when governments intervene to direct FDI into developing local capabilities (Amsden, 2001).

Another area of potential public involvement at the external level is the pursuit of regional integration as a vehicle for increasing market size, enhancing supply capacity and achieving larger and better-integrated industrial chains. While politically challenging, market integration, and the eventual consolidation of upstream players across CDEs may arguably be the only workable avenue to compete in a globalized economy with increasingly consolidated downstream segments and large competitors such as China and India. By opening spaces for intra-regional coordination, regional integration can create the scale capacity and agglomeration conditions necessary for galvanizing industrial learning. Integration schemes, however, should emphasize intra-regional cooperation in fields such as technology and skill formation, and have industrial upgrading as a goal if they are to avoid a specialization pattern that could lock an entire region into low value-added processes.

Finally, in addressing upgrading barriers deriving from distorted agricultural markets and tariffs biased against value added, CDEs could joint forces to press for more favorable trade conditions. The rules of international trade are so important for determining upgrading opportunities that some authors have argued that CDEs will remain locked into commodity trade if such rules are not changed in their favor (Wade, 2004).
4.2 Addressing Firm-level or Upstream Constraints

This is a critical and commonly neglected area of potential public involvement, where firms can be assisted to overcome size and coordination constraints. As discussed earlier, building an initial threshold of firm-level capabilities requires nowadays more autonomous efforts as FDI becomes less available and less catalytic to technological learning in CDEs (Memedovic, 2004). Strategies to assist the upgrading of local firms should start by identifying export industries as well as local lead firms within such industries that are in a better position to link up to global production networks. National lead firms can be large domestic producers or export companies capable of becoming an exogenous push for the upgrading of other first and second-tire local suppliers (Gibbon, 2000). They should be especially assisted in their upscaling and the buildup of commercial and industrial capabilities.

Once local lead firms are identified and assisted, efforts should be directed at improving the systemic competitiveness of local value chains. Systemic competitiveness refers to the efficiency of an entire production system – including all vertical and horizontal linkages – and is determined by both the competitiveness of individual units and the level of coordination among them. In the case of CDEs, systemic competitiveness can be enhanced by encouraging the formation of industrial clusters emphasizing inter-firm cooperation both among competing firms and across segments along the chain. By cooperating within industrial clusters, firms can achieve collective efficiency and hence overcome the size and coordination constraints they face at the individual level. Collective efficiency within clusters, in turn, derives from external economies and joint actions (Altenburg and Meyer-Stamer, 1999). *External economies* in industrial clusters are realized in various forms such as (i) the emergence of specialized suppliers (capital providers and a specialized pool of labor) responding to a larger production scale, (ii) greater bargaining power vis-à-vis financial institutions, governments and external actors; and most importantly (iii) the exchange of information and knowledge that facilitates dynamic learning and technical innovation among participating firms (Pietrobelli and Rabellotti, 2004). *Joint action*, on the other hand, enables firms to coordinate production and achieve higher collective scale, which allows them, among other things, to meet larger orders at lower unit costs. Other joint actions may include joint market research, joint purchasing of inputs, common use of specialized equipment, joint product development and joint selling, all of which contribute to enhancing the competitive performance of the entire cluster (Pietrobelli and Rabellotti, 2004). Better inter-firm cooperation can also help firms achieve shorter lead times, quality consistency and supply reliability, nowadays becoming key critical factors to compete in global markets. Finally, knowledge sharing among clustered firms can foster innovation and help create upgrading opportunities in upstream activities.

While clusters offer an attractive avenue for upgrading production systems in CDEs, their configuration can be difficult and contingent to a large extent upon subtle factors such as leadership and the level of trust among participating firms. This process can be catalyzed by intermediate entities such as the government acting as a “cluster broker” (Pietrobelli and Rabellotti, 2004). A cluster broker can be a decentralized and autonomous public agency promoting clusters by virtue of (i) facilitating the development of external economies; (ii) fostering inter-firm linkages; and (iii) strengthening the position of local firms within global value chains (ibid). External economies can be facilitated through the configuration of specialized factor markets, including skills, finance, technology and research. Inter-firm linkages, on the other hand, can be promoted by strengthening business associations, facilitating external connections, and more directly, by engaging firms into collective project, where the government itself can participate as partner. Finally, the position of local firms within global chains can be improved by aggressively targeting global lead firms and assisting domestic suppliers in building complementary capabilities.

As to the potential downsides of clustering, words of warning are often directed towards the inefficiencies that may arise when internal competition becomes limited and inter-firm cooperation
leads to collusive behavior (Riendfleisch and Moorman, 2002). While achieving a healthy balance between internal competition and cooperation remains important, increased global competition in commodity chains coupled with greater consolidation in downstream segments are likely to exert the competitive pressures necessary for domestic clusters to seek efficiency gains. In addition, and as argued earlier, as global production networks demand more sophisticated standards and operate through more centralized supply systems, the minimum scale necessary for successfully inserting into global markets, including niche segments, is arguably increasing. Against these conditions, achieving collective efficiency through clustering can hardly be seen as a defensive move to shield firms from competition, but as rather a necessary step to survive in global markets. Clustering will only lead to undesired results if it fails to deliver on its potential due to operational and implementation problems. As Kaplinsky et al (2003) point out, maintaining and sustaining a cluster network requires an enormous amount of energy, resources and coordination capabilities, which should not be underestimated.

4.3 Addressing Framework Conditions and Structural Constraints

Efforts to address external and firm-level competitive constraints will have limited impact if framework conditions remain unstable and structural factors insufficient to drive industrial growth. The government role in enabling framework conditions for private sector development – including economic stability and good public governance – is universally recognized and widely promoted across CDEs. Conversely, public efforts to overcome structural constraints to industrial growth, especially in the areas of technology, human capital formation and innovation systems, remain largely insufficient. More systematic actions aimed at setting industrial drivers in motion are critical in CDEs because of two major reasons. First, and as discussed earlier, market failures and the dynamics of global production networks are making it increasingly difficult for small CDEs to attract complex functions. Second, due to uncertain appropriability and risk aversion, domestic firms may not be in a position to undertake critical upgrading investments on their own, and may be prone to fall under a static path of industrial inertia. More autonomous efforts are therefore needed to buildup initial capabilities and develop the agglomeration and scale necessary to attract global lead firms (Memedovic, 2004).

Encouraging innovation systems seems of particularly relevance for CDEs facing high entry barriers in downstream segments and reduced spaces for manufacturing diversification. Competitive pressures are forcing CDEs to seek more creative ways to increase value in upstream activities and target more sophisticated and demanding niche segments. This requires not only technological upgrading and systemic efficiency but also to innovate in organizational processes, supply chain systems, product development and marketing practices. Because of their flexible nature, SME clusters can create suitable environments fostering innovation. To facilitate this process, a cluster broker can play a catalytic role in bringing firms, universities and research centers into a circle of cooperation.

Exhibit 10 summarizes some of the key areas of public intervention discussed in this section, which can constitute a framework for outlining national economic upgrading strategies. In order to minimize the risks associated with public intervention and avoid the historical mistakes of ill-conceived approaches, the design and implementation of upgrading strategies should follow six underlying principles.

i. Upgrading strategies should be country-specific and dynamic in nature. Policies must be shaped considering local conditions and capabilities, and reshaped as new challenges emerge. Creating the institutional flexibility to adapt and respond to changing conditions is therefore paramount for the success of upgrading strategies.
ii. The impact of any intervention will be maximized if they are selective and create synergies. Selectivity underlines the importance of concentrating efforts on addressing major competitive bottlenecks in a reduced number of industries, as opposed to broad horizontal reforms. Synergies are created when policies are coordinated at the macro, micro and meso levels as well as with non-government actors, most fundamentally, the private sector.

iii. The combination of selectivity and synergies in the design an implementation of upgrading strategies emphasizes the notion of “systemic competitiveness”, which establishes that productive efficiency can only be enhanced if policies address entire value chain systems as opposed to sectors or firms in isolation.

iv. Upgrading strategies will work best if led by a “nodal agency” empowered to coordinate across different public agencies and designed with sufficient embeddedness and autonomy. Embeddedness refers to the capacity of a nodal agency to interact with the private sector in both designing and implementing upgrading policies. Autonomy highlights the importance of keeping a level of independence from both political and private interests in order to preserve objectivity and coherence in the policy making process.

v. Upgrading usually follows a sequential process that starts with the improving of internal processes (process upgrading), continues with the enhancement or development of new products (product upgrading), follows with the leap into higher-value-added activities such as marketing and branding (functional upgrading), and eventually the diversification into other industries (chain or intersectoral upgrading) (Kaplinsky, 2000). Upgrading policies must be coherent with such process.

vi. Last but not least, a national upgrading strategy should be envisaged as part of a long-term national vision and given enough political support if it is to deliver sustained results. A system of incentives that reward success and allow to divest failing forms of intervention must also be put in place. Specific and monitorable targets in key areas such as export growth, market share, technology benchmarks, manufacturing value-added and effective linkages with global lead players, can serve to guide and discipline public action.

Exhibit 10: A Framework for Upgrading Strategies
5. Some Upgrading Experiences

This last section discusses five cases of CDEs that succeeded in overcoming commodity dependency by either diversifying into new sectors or moving into higher value-added segments within primary industries. The cases are not presented as upgrading patterns that can be replicated in other CDEs, but to illustrate the different forms of public intervention discussed in the previous section. All cases lay emphasis on the catalytic role of selective supply-side industrial policy addressing competitive constraints at the upstream, downstream, framework and structural levels in a synergetic fashion.

5.1 Information and Communication Technologies in Finland

Although not a developing country, Finland had long been dependant on its forestry sector, which before 1990 contributed with 65% of total exports (Schienstock et al, 2004). In spite of having developed an industrial base around the forestry sector, which included the mechanical forestry industry and the chemical forestry industry (pulp and paper), Finland’s strong dependency on a single sector made it vulnerable to foreign shocks, which came evident in the early 1990s when an economic crisis wrought havoc with devastating effects on exports, employment and productivity. Following the crises, Finland embarked on a deep process of structural upgrading, transforming its economy from resource-dependant to knowledge-based in a relatively short period of time. By 1999, the forestry sector’s contribution to total exports had been reduced to less than 35% (ITC, 2002) and a new engine of growth emerged in the electrical and communications sector, whose share reached 29% (Schienstock et al, 2004).

Finland’s structural upgrading can be seen as the result of national policies providing frames and resources for action and that of autonomous efforts of core firms and support institutions, developing specific competences (Schienstock et al, 2004). Specifically, the emergence of Information and Communication Technologies (ICT) as the engine of Finland’s structural transformation has arguably been galvanized by selective industrial policies targeting primarily upstream constraints and stimulating structural drivers. The selective nature of the upgrading strategy comes into light when examining the sectoral and regional bias of public expenditure. Between 1995 and 1999, approximately half of the nation’s R&D expenditure was directed to the ICT sector, most of which concentrated within the Tampere region, where the ICT cluster was being developed. Within this period, Tampere’s R&D expenditure rose 25%, contrasting with only 14% at the national level (Schienstock et al, 2004). In terms of per-capita distribution, Tampere received in 1999 1,100 FIN from the industrial policy budget and 880 FIN from the national technology budget, while national averages oscillated around 710 FIN and 460 FIN respectively (Ibid).

At the upstream level, public support institutions focused on encouraging the formation of cooperative networks of firms as a way of overcoming scale limitations and foster innovation. As leading domestic firm, Nokia was identified as the sector’s upgrading engine and hence encouraged to establish horizontal linkages with other smaller firms as well as vertical cooperative agreements with suppliers and sub-contractors. Bridging institutions such as the “Centers of Expertise” acted as cluster brokers, facilitating inter-firm dialogue and bringing Nokia into partnerships with other related firms. Today, nearly 85% of firms in the Tampere region are part of some form of cooperative network (Schienstock et al, 2004—exhibit 11).

5 From the concept of “Embedded Autonomy” developed in Peter Evans (2004).
Public efforts to stimulate structural drivers, especially human capital and technology, have been distinctively targeted to the ICT sector. As discussed earlier, the largest percentage of technology and research budget in Finland is directed to ICT and nearly 35% of university students currently graduate in ICT-related subjects (Schienstock et al, 2004). The government has also sought to improve the systemic efficiency within the ICT cluster by promoting cooperative ties between firms, higher education institutions and research centers. Specialized public support-institutions such as the “Digital Media Institute” and the “Optoelectronics Research Institute” have been key in providing the space for horizontal cooperation and in coordinating large-scale joint investments, including research facilities and prototype production equipment. Around 80% of manufacturing or knowledge-intensive companies in Finland today have at least some form of cooperation with universities and research institutes (ibid—exhibit 12).

National and municipal governments in Finland have also coordinated efforts to provide finance and special services to emerging ICT companies. The city of Tampere has played an active role in financing business developments directly through SENTIO Investments, a major venture capital company owned by the municipality. The city also finances, owns or is a shareholder of a number of ICT-related companies, which include the Tampere Technology Centre, Hermia Science Park and several other regional funds (Schienstock et al, 2004). Other key support institutions include the National Technology Agency (Tekes), The Regional Employment and Economic Development Center (EEDC) and Finnvera; Each one of them specializing in distinct support instruments that include R&D grants, direct loans, technological programs, business advisory services, training consultancy, project development, and
sectoral information. Today, nearly 85% of firms in the Tampere region have at least some form of cooperation with one or more public support-institution (ibid—exhibit 13).

Exhibit 13: Share of companies having frequent cooperation with public intermediaries and finance organizations

![Diagram showing cooperation percentages with various organizations.]

Source: Author based on Schienstock et al (2004:146)

5.2 Fresh Vegetables in Kenya

Kenya has become a preferred supplier of fresh vegetables to Europe, in particular to the UK market, which is the largest for African horticulture products (Dolan et al, 2000). Many Kenyan firms have upgraded into higher value-added activities including packaging, logistics and bar coding, and diversified into new market niches such as “Asian Vegetables”, where they have replaced India as the primary supplier to the UK. The successful upgrading of Kenya’s horticulture industry highlights the role of upscaling and enhanced supply-chain coordination in responding to increasingly asymmetrical buyer-driven chains.

The horticultural industry in the UK has become dominated by the top four supermarkets – Tesco, Sainsbry’s Asda and Safeway – controlling 75% of food sales and between 70% and 90% of imports from Africa (Dolan et al, 2002). Their increased market power has enabled them to capture over 45% of the industry’s total value-added and exercise key decisions regarding the inclusion or exclusion of players. This governance shift has created upgrading opportunities for certain firms while driving other into exclusion. Those that were able to upgrade made systematic efforts to improve six core capabilities: increased volume capacity, quality consistency, supply reliability, product variety, innovation and ethical standards (Ibid). Critical in creating such capabilities in the case of Kenyan firms has been upscaling and backward integration. Smallholder-based production have given way to vertically integrated firms sourcing from large-scale production units, which nowadays account for 82% of Kenya’s total horticulture farming (Ibid—exhibit 14). The country’s largest exporter “Homegrown”, for example, reduced its smallholder sourcing to less than 10% and now supplies 90% directly from owned units (Ibid). Upscaling and vertical integration have allowed firms to exert higher control over production processes in order to better comply with quality, environmental and social standards and provided with the scale necessary to buffer major investments in irrigation systems, modern machinery and sophisticated supply-management information technologies.
Upscaling has also enabled horticulture firms to gather a critical production mass that stimulated the emergence of specialized supporting services and hence enhanced the chain’s overall systemic competitiveness. Airlines, for instance, now offer daily flights to major markets in order to accommodate to the needs of horticulture exports. This has contributed to ensuring supply reliability and allowed firms to incorporate modern supply management systems, namely “Just In Time Delivery” (JIT). Only large-scale exporters such as “Homegrown” have been able to obtain customized transportation services by virtue of entering into strategic alliances with air freighters.

Government support for commercial horticulture in Kenya has been very active at the structural and downstream levels. A number of public institutions, including the “Horticultural Crops Development Authority” (HCDA), have been vigorously involved with providing extension and advisory services, disseminating market information and investing in research and development (Andersson et al, 2005). The government has also been aggressive in targeting FDI, which has been catalytic in the upgrading of local farming. The arrival of Asian investors, for instance, has been catalytic in propelling Kenyan firms into the “Asian Vegetables” niche (Dolan et al, 2000).

In marked contrast with larger firms, small and medium-sized farmers, which still account for 18% of horticulture production in Kenya, have remained largely excluded from the UK and other European markets (Dolan et al, 2000). Failure to achieve a minimum acceptable scale has made upgrading investments in critical areas such as supply capacity, logistics and air transportation prohibitive for smaller firms. This, in turn, has detached small local producers from global lead firms and hence from critical technical and market information. Exports by small firms to the UK market have been sporadic and based on arms-and-lengths transaction subject to price discounts and vulnerable to opportunistic behavior from the part of importers. This has been the case of “Pumpkin Ltd.”, a small Kenyan firm which after failing to comply with volume requirements and quality standards was excluded from major European markets and forced to retrieve to less profitable ones in the Middle East (Ibid).

5.3 Manufacturing and Services in Mauritius

Mauritius was once regarded as one of the smallest and poorest islands in the southern cone of Africa, with a monocrop economy that relied primarily on sugar exports. In a three-decade period, Mauritius transformed itself into a regional hub of manufacturing and offshore services. Between 1970 and 2000, the share of sugar exports declined from 65% to less than 8%, while that of manufacturing and services combined increased to 88% (Nathan, 2003 – Exhibit 15). Mauritius’ upgrading success has been the result of institutional innovation and a well-balanced industrial
strategy targeting competitive constraints at the framework, structural upstream and downstream levels.

**Exhibit 15: Technological Upgrading of Mauritius' Export Structure**

![Mauritius Exports - Share by Product Category](chart.png)

Mauritius started its industrial development in the early 70s under a mixed import substitution-export development strategy. Some protection in the form of quotas was given to nascent local firms, which provided them with a breeding space for skill formation and the buildup of industrial experience. Protection was gradually dismantled to allow competitive pressures drive further efficiency gains. At the time the economy entered a process of liberalization in the early 80s, more emphasis was given to supply-side industrial policies. The government first created and Export Processing Zone (EPZ) in order to improve framework conditions and attract foreign investment into the manufacturing sector. This was complemented by aggressive FDI targeting strategies aimed at attracting global lead firms, especially from Hong Kong, as well as effort to seek preferential access to European markets through the Multifiber Agreement. To spearhead this action the government created the “Mauritius Export Development and Investment Authority” (MEDIA).

Once foreign firms were established in the EPZ, industrial policies focused upstream assisting the upgrading of local firms and fostering technology and knowledge transfers, as well as emphasizing value-adding processes generated within the zone. The “Small and Medium Industries Development Organization” (SMIDO) was created to provide local firms with start-up finance and specialized consultancy and managerial services. Upstream policies were closely coordinated with MEDIA, which specialized in downstream support activities such as foreign markets intelligence and the identification of potential international partners. Both SMIDO and MEDIA also acted as “cluster brokers”, fostering inter-firm cooperation through innovative schemes such as the “Beehive Initiative” (BI), which promotes subcontracting and outsourcing linkages between large established enterprises and smaller firms (ITC, 2002). The emphasis on developing local capabilities and fostering backward linkages succeeded in increasing the EPZ's contribution to national value-added from 18% to 48% (ITC, 2002), while reducing the share of imported inputs from 80% to 50% during the 1980-2000 period (Nathan, 2003). In addition, the share of Mauritian-owned firms in the zone increased progressively reaching 40% in 2000 (Ibid).

The Mauritian government has also been active in stimulating structural drivers in the apparel sector through different institutions. The “Export Processing Zone Development Authority” (EPZDA) was initially created to facilitate the competitive upgrading of the apparel industry by organizing trainings on productivity, quality and design. EPZDA also created the “Clothing Technology Center” (CTC), which assists manufacturing firms in technology applications, product development and R&D, while providing free-of-charge consultancy services on managerial and technical issues. Two other key institutions have been the “Mauritius Standard Bureau” (MSB) and the “Industrial/Vocational Training Board” (IVTB). MSB formulates quality standards and promotes the quality image of Mauritian
products abroad. IVTB, on the other hand, seeks to develop specialized skills by investing in training facilities, providing incentives for employee training, and bringing educational centers into partnerships with firms.

Key to the success of industrial policy in Mauritius has been the synergies created both across public institutions and between the public and private sectors. Institutional coherence has been facilitated by a system of division of functions, whereby each institution specializes on complementary activities (exhibit 16). Having private sector representatives sitting at the board of all major public support agencies, on the other hand, has smoothed public-private cooperation (ITC, 2002).

**Exhibit 16: Institutional Specialization in Mauritius’ Industrial Strategy**

With the emergence of lower-cost producers within the region and in anticipation of the Multifiber Agreement phase-out, Mauritian firms have been encouraged to internationalize through outsourcing schemes, with MEDIA itself becoming involved in the promotion of outward FDI. Mauritian apparel firms now appear as major investors in neighboring countries such as Mozambique and Madagascar. In parallel to such efforts, the supportive institutional machinery has been gearing to promote other exportable sectors such as tourism and offshore services. The latter including financial centers, international business consultancy and marketing, where Mauritius is becoming a strong player.

**5.4 Agro-Processing in Chile**

While still relying on resource-based industries, Chile has made a significant progress in upgrading into higher-value added activities, expanding its exportable product range and diversifying into new export markets. Over the past 25 years, the value of Chilean exports increased tenfold; the number of exporting firms increased from 200 to more than 6,000; the range of exportable products expanded from 200 to 3,800; and the number of export markets grew from 50 to 172 (ITC, 2002). Since the 1970’s, Chile’s upgrading strategy has built upon liberal policies, emphasizing a competitive environment for domestic firms, but nevertheless including selective supply-side interventions aimed at projecting agro-industries into export markets. A key institution coordinating such policies has been the “Trade Promotion Commission” (ProChile), first established in 1974 with the purpose of
enhancing framework conditions for non-traditional exports, by modernizing administrative procedures and developing export incentive schemes. ProChile later became the government’s main arm for downstream support activities, which included gathering market information intelligence, promoting Chile’s commercial image through generic advertising, and most importantly, aggressively targeting FDI with an army of foreign attaches. The institution placed special emphasis on connecting local firms with global lead players in order to gain access to export markets and modern technology and skills. In the case of the wine industry, for example, early joint ventures between local producers and leading international brands have been catalytic in propelling Chile as a major global player (exhibit 17).

**Exhibit 17: Major Wine Companies in Chile**

Industrial policy in Chile has been particularly active at the upstream level, where the government in cooperation with the private sector set up Fundación Chile for the nurturing of new industries. Fundación Chile specialized in the adaptation of foreign technology and the creation of pilot or prototype enterprises in sectors with export potential. Embryonic enterprises were nurtured until they reached technical and commercial viability, and later sold to the private sector to become models for replication. Fundación Chile has given birth to some of today’s thriving exporting industries, including Salmon processing, which emerged from prototype farms developed with adapted Norwegian and Scottish technologies (ITC, 2002). Fundación Chile has also catalyzed the development of the wine industry by investing in experimental estates with drip irrigation to test wine varieties and adapting processing technologies, mainly from Australian origin (Gwynne, 2005).

Both Fundación Chile and ProChile have also played an active role in promoting cooperation between firms, technology centers and research institutions, hence acting as true “cluster brokers” (ITC, 2002). Clustering has been critical in overcoming scale limitations in a country still dominated by small and medium sized enterprises. Scale efficiency has also been achieved through the consolidation of upstream local players, namely exporting agencies coordinating entire local production network. Four large exporting companies today control over 80% of Chilean exports (Ibid). Other industries – especially those relying on upstream processes for assuring quality, such as wine – have achieved scale and coordination capacity by virtue of vertical integration (Gwynne, 2005).
Public efforts in Chile have also been active in stimulating structural drivers of industrial performance. In addition to Fundación Chile supporting firm-level technology development, the “Production Fostering Organization” (CORFO) has been established as a nodal agency aligning universities, training centers and other service providers with the needs of the export sector. CORFO also provides innovation finance and directly assists individual firms in innovation areas such as design and product development (ITC, 2002).

5.5 Apparel and High-Tech in Costa Rica

Before 1970, only four products – coffee, bananas, sugar and beef – accounted for more than 60% of export revenues in Costa Rica (Nathan, 2003). Three decades later, that share was reduced to less than 12%, while that of manufacturing exports increased to 52% (ibid). The engine of this first structural transformation has been apparel exports, which grew at annual rates of 30% during the 80s (ibid). In the past decade, Costa Rica has undergone a second structural shift, moving into high-end services and non-apparel manufacturing. The former now represents 20% of export revenues and includes computer programming, cosmetic surgery and tourism (ibid). Non-apparel manufacturing, on the other hand, has reached an export share of 40%. Within this category, high-tech products including computer chips have become the new engine of export growth since 1998 (ibid).

Industrialization in Costa Rica has its roots in the late 1960s, when import-substitution policies lead to a period of rapid industrial deepening (Rodriguez, 1998). While inward-looking in nature, import-substitution policies in Costa Rica were not entirely biased against exports, as they were conceived within a context of regional integration under the “Central American Common Market” (CACM), and included initiatives such as “export certificates”, subsidizing incremental exports to non-CACM markets. Despite these variants however, import-substitution in Costa Rica did not succeed in producing internationally competitive industries. It nevertheless helped create a more dynamic entrepreneurial group, more efficient financial and professional services, better technological knowledge, and a better trained labor force, all of which later facilitated structural transformation under more open policies (Rodriguez, 1998).

In the early 1980s, Costa Rica began a gradual transition to a more open economy, providing firms with a breathing space to adapt to new competitive settings. While liberalizing, industrial policy continued to be active in the form of supply-side support to the manufacturing sector. The government first oriented efforts towards enhancing framework conditions for manufacturing exports, which was largely achieved through the establishing of an “Export Processing Zone” (EPZ) simplifying administrative procedures and providing fiscal incentives to exporters. Since its conception, the EPZ was envisaged as a vehicle for industrial learning, thus emphasis was given to the zone’s contribution to national value-added and backward linkages with domestic producers. Between 1990 and 1995, the aggregate value-added created within the zone increased from $25 to $142 millions, while the value of local purchases grew steadily at annual rates exceeding 30% (Rodriguez, 1998).

At the downstream level, efforts were directed at opening major markets for Costa Rican product. In 1983, the country was included in the “Caribbean Basin Initiative” (CBI), which granted some products free access to the US market. While CBI did not initially include dynamic industries such as apparel, it played a critical role in driving the attention of key foreign investors into the region (Rodriguez, 1998). Costa Rica has also been aggressive in attracting FDI into its manufacturing sector (exhibit 18), focusing lately on high-tech global firms such as Intel, which helped jumpstart the microchip industry in the country. Catalytic in attracting FDI has been the “Costa Rican Investment and Trade Development Board” (CINDE), which has positively influenced 61% of all inflows between 1986 and 1990 (ibid).
Structural drivers in Costa Rica have also been selectively stimulated to benefit the exporting sector. The tertiary education system has been continuously upgraded and aligned to the needs of industry, producing the best-educated labor force in the region (Nathan, 2002). Efforts have also been directed at expanding research centers and other support institutions specializing in export services. The government also subsidizes specialized training and often provides “innovation-financing” through venture-capital-types of schemes. Many of today’s successful exporters have benefited from government-led financing at their early stages of development (Rodriguez, 1998). At the upstream level, both the government and CINDE encourage cooperative linkages between producers associations, universities and research centers, and assist individual firms to overcome managerial and technical bottlenecks (ibid).

Concluding Remarks

− Developing countries inserting into the global economy through commodity exports have little opportunities to sustain income growth in the long run. Only by upgrading into high-value-added processes within primary industries or diversifying into technology-based and skill-intensive sectors, will they be able to seize the development opportunities brought about by globalization.

− GVC analysis allows to identify four set of barriers inhibiting structural upgrading and hence explaining commodity dependency in small developing economies. At the external or downstream-level, asymmetrical power structures in increasingly buyer-driven commodity chains are limiting the options of small countries to capture downstream value through functional upgrading; while the widening technological gap with larger developing countries poses even greater obstacles for diversifying into technology-based products through intersectoral upgrading. At the internal or upstream level, firms in small countries are unable to create beyond arms-and-lengths linkages with global lead players, due to scale limitations and low coordination capacity. In addition, and in most cases, poor framework conditions and deficient structural drivers – including skills, technology and innovation – largely inhibit the emergence of industrial capabilities.

− Against this background, large developing countries offering scale and agglomeration economies, such as China and India, are in a better position to seize upgrading opportunities in global markets. More distressingly for CDEs, as these large economies take over on a wider range of
manufacturing products, small countries will be faced with narrow spaces for industrial diversification.

- Escaping commodity dependency requires massive efforts to overcome both external and internal barriers to structural upgrading. While improving framework conditions and gaining access to rich markets remain imperative, more emphasis is needed in addressing managerial, technical and coordination bottlenecks at the micro-level. This, in turn, calls for a reevaluation of national industrial strategies geared to building local competitive capabilities.

- In a context of liberalized trade regimes, industrial strategies will work best if conceived as supply-side interventions targeting structural drivers of industrial performance (skills, technology and innovation systems) and seeking to enhance the systemic competitiveness of local production chains. Empirical evidence suggests that such policies will have more impact if oriented at specific competitive bottleneck in a reduced number of industry clusters (selectivity) and are carried out by autonomous public institutions in close coordination with the private sector and other horizontal organizations such as universities and research centers (synergies).

- The specific form of industrial policy will depend on country-specific contextual factors and institutional endowments, and must be flexible enough to respond to increasingly dynamic and complex global settings.

- While the risk of government failure remains high in countries with deficient public governance, the potential economic and social costs of continuing with passive policies unsuited to drive industrial growth are arguably higher. Building government capabilities, therefore, remains critical for the successful implementation of industrial strategies. Ideally, nodal institutions designing and carrying out industrial policy should have a sufficient level of political and operational autonomy, while at the same time be empowered to coordinate across different government agencies. They should also be capable of liaising with the private sector while insulating themselves from vested interest groups. A performance-based system, whereby competitive benchmarks and export targets are used to decide whether policies are continued or divested, can greatly help discipline public intervention.

- Because of the high level of sophistication and innovation needed to mount upgrading strategies, and considering the institutional weaknesses prevailing in most CDEs, International Development Organizations can play a catalytic role in filling institutional and coordination voids.
References


Appendix

Commodity-Dependency and Business Environment

Source: Author based on Bonaglia and Fukasaku (2003) and Doing Business Report Database

Commodity-Dependency and Political Stability

Source: Author based on Bonaglia and Fukasaku (2003) and Governance Indicators Database
Commodity-Dependency and Corruption

Source: Author based on Bonaglia and Fukasaku (2003) and Governance Indicators Database

Commodity-Dependency and Business Competitiveness

Source: Author based on Bonaglia and Fukasaku (2003) and Global Competitiveness Report
Commodity-Dependency and Microeconomic Environment

Quality of the microeconomic environment index (1= best quality)

Source: Author based on Bonaglia and Fukasaku (2003) and Global Competitiveness Report

Commodity-Dependency and Firm Strategies

Company operations and strategy (1= best quality)

Source: Author based on Bonaglia and Fukasaku (2003) and Global Competitiveness Report
Commodity Dependancy and Technological Efforts

Commodity Dependancy and Tertiary Enrollement

Source: Author based on Bonaglia and Fukasaku (2003) and Lall (2005)