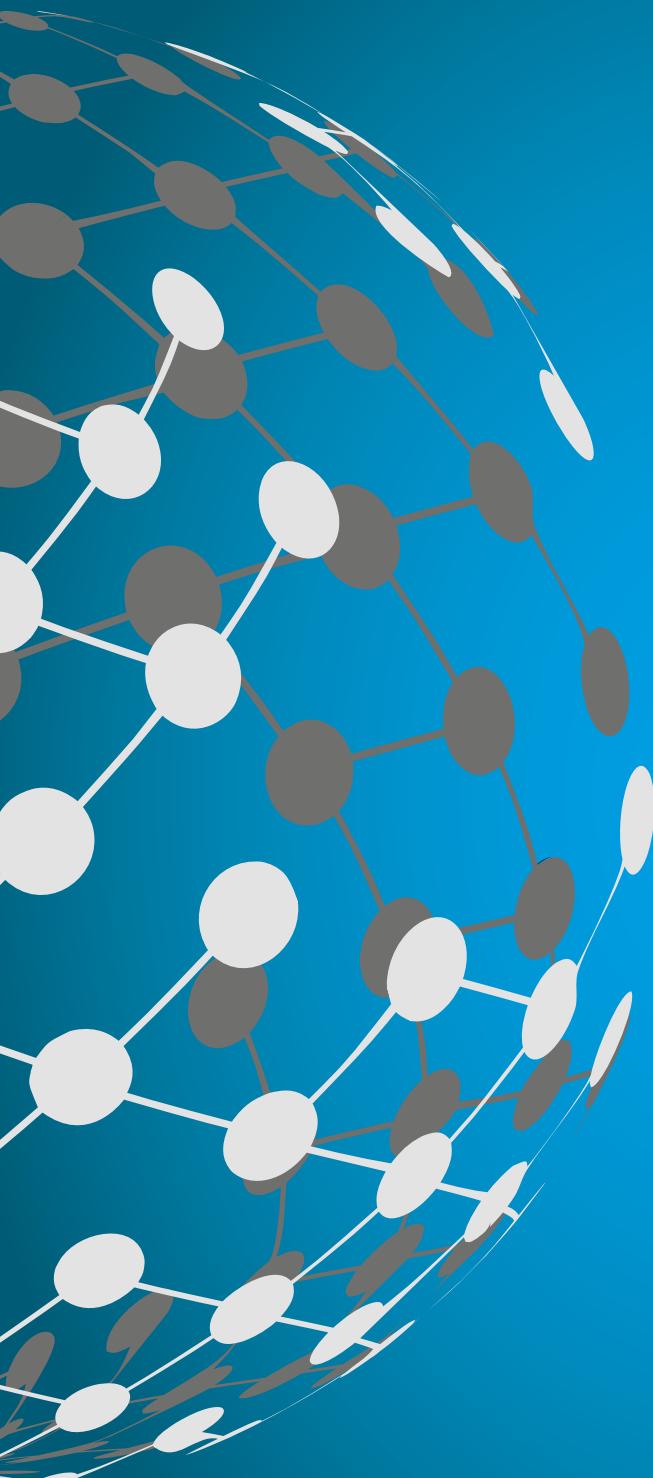


Second Edition >>



# GLOBAL VALUE CHAIN ANALYSIS: A PRIMER

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&  
Karina Fernandez-Stark*

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July 2016

Duke

CENTER on GLOBALIZATION,  
GOVERNANCE & COMPETITIVENESS  
*at the* Social Science Research Institute

The Duke Center on Globalization, Governance & Competitiveness (Duke CGGC) undertakes client-sponsored research that addresses economic and social development issues for governments, foundations and international organizations. We do this principally by utilizing the global value chain (GVC) framework, created by Founding Director Gary Gereffi, and supplemented by other analytical tools. As a university-based research center, we address clients' real world questions with transparency and rigor.

## Acknowledgements

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## >> Preface for Second Edition

The first edition of Global Value Chain Analysis: A Primer was released five years ago (May 2011) in order to provide an overview of the key concepts and methodological tools used by Duke University's Center on Globalization, Governance & Competitiveness (Duke CGGC) a university-based research center that focuses on innovative applications of the GVC framework, which was developed by Duke CGGC's founding director, Gary Gereffi. Duke CGGC has carried out, and made available on its website (<http://www.cggc.duke.edu/>), a multitude of GVC projects for many different clients – national governments, international organizations, global and regional development banks, environmental and development-oriented non-government organizations (NGOs), foundations and others. During these past five years, interest and use of the GVC framework have grown exponentially among academics, development practitioners, policy makers and a wide range of international organizations and agencies concerned with economic, social and environmental issues.

The Second Edition of Global Value Chain Analysis: A Primer (July 2016) retains a simple, expository style and use of recent research examples in order to offer an entry point for those wishing to better understand and use the GVC framework as a tool to analyze how local actors (firms, communities, workers) are linked to and affected by major transformations in the global economy. The GVC framework focuses on structural shifts in global industries, anchored by the core concepts of governance and upgrading. This Second Edition highlights some of the refinements in these concepts, and introduces a number of new illustrations drawing from recent Duke CGGC research. The bibliography offers a sampling of the broad array of studies available on the Duke CGGC website and in related academic publications. We hope this work stimulates continued interest in and use of the GVC framework as a tool to promote more dynamic, inclusive and sustainable development outcomes for all economies and the local actors within them.

**Gary Gereffi and Karina Fernandez-Stark**

## >> I. Importance of Global Value Chains

The global economy is increasingly structured around global value chains (GVCs) that account for a rising share of international trade, global GDP and employment. The evolution of GVCs in diverse sectors, such as commodities, apparel, electronics, tourism and business service outsourcing has significant implications in terms of global trade, production and employment and how developing country firms, producers and workers integrate into the global economy. GVCs link firms, workers and consumers around the world and often provide a stepping-stone for firms and workers in developing countries to participate into the global economy. For many countries, especially low-income countries, the ability to effectively insert into GVCs is a vital condition for development. This supposes an ability to access GVCs, to compete successfully and to "capture the gains" in terms of national economic development, capability building and generating more and better jobs to reduce unemployment and poverty. Thus, it is not only a matter of whether to participate in the global economy, but how to do so gainfully.

The GVC framework allows one to understand how global industries are organized by examining the structure and dynamics of different actors involved in a given industry. In today's globalized economy with very complex industry interactions, the GVC methodology is a useful tool to trace the shifting patterns of global production, link geographically dispersed activities and actors within a single industry, and determine the roles they play in developed and developing countries alike. The GVC framework focuses on the sequences of value added within an industry, from conception to production and end use. It examines the job descriptions, technologies, standards, regulations, products, processes, and markets in specific industries and places, thus providing a holistic view of global industries both from the top down and the bottom up.

The comprehensive nature of the framework allows policy makers to answer questions regarding development issues that have not been addressed by previous paradigms. Additionally, it provides a means to explain the changed global-local dynamics that have emerged within the past 20 years (Gereffi & Korzeniewicz, 1994). As policy makers and researchers alike have come to understand the pros and cons of the spread of globalization, the GVC framework has gained importance in tackling new industry realities such as the role of emerging economies like China, India and Brazil as new drivers of global value chains, the importance of international product and process certifications as preconditions of competitive success for export-oriented economies, the rise of demand-driven workforce development initiatives as integral to dynamic economic upgrading, and the proliferation of private regulations and standards (Lee, 2010; Mayer & Gereffi, 2010), while also proving useful in the examination of social and environmental development concerns. A range of institutions and governments have commissioned GVC studies to understand global industries and to guide the formulation of new programs and policies to promote economic development.

## >> II. What are Global Value Chains?

The value chain describes the full range of activities that firms and workers perform to bring a product from its conception to end use and beyond. This includes activities such as research and development (R&D), design, production, marketing, distribution and support to the final consumer. The activities that comprise a value chain can be contained within a single firm or divided among different firms (globalvaluechains.org, 2011). In the context of globalization, the activities that constitute a value chain have generally been carried out in inter-firm networks on a global scale. By focusing on the sequences of tangible and intangible value-adding activities, from conception and production to end use, GVC analysis provides a holistic view of global industries – both from the top-down (for example, examining how lead firms “govern” their global-scale affiliate and supplier networks) and from the bottom-up (for example, asking how these business decisions affect the trajectory of economic and social “upgrading” or “downgrading” in specific countries and regions).

There are six basic dimensions that GVC methodology explores that are divided in global (top-down) and local elements (bottom-up) (See Figure 1). The first set of dimensions refers to international elements, determined by the dynamics of the industry at a global level. The second set of dimensions explain how individual countries participate in GVCs. These six dimensions are: (1) an input-output structure, which describes the process of transforming raw materials into final products; (2) the geographic scope, which explain how the industry is globally dispersed and in what countries the different GVC activities are carried out; (3) a governance structure, which explains how the value chain is controlled by firms. The local dimensions are: (4) upgrading, which describes the dynamic movement within the value chain by examining how producers shift between different stages of the chain Gereffi (1999) and Humphrey & Schmidt (2002) (5) an institutional context in which the industry value chain is embedded in local economic and social elements (Gereffi, 1995); and (6) industry stakeholders, which describes how the different local actors of the value chain interact to achieve industry upgrading.

**Figure 1. Six Dimensions of the GVC Analysis**



Source: Fernandez-Stark, Bamber and Gereffi, 2013.

The global value chain approach analyzes the global economy from these two contrasting vantage points: “top-down” or global and “bottom-up” or local.

“Governance” of global value chains, a key concept of the top-down view, focuses mainly on lead firms and the organization of international industries. Upgrading, the main concept for the bottom-up perspective, focuses on the strategies used by countries, regions, and other economic stakeholders to maintain or improve their positions in the global economy.

## >> III. Dimensions of GVC analysis

Six dimensions constitute global value chain analysis. They are discussed below from the researcher's perspective.

### 1. Input-Output Structure

#### a. Identify the main activities/segments in a global value chain.

A chain represents the entire input-output process that brings a product or service from initial conception to the consumer's hands. The main segments in the chain vary by industry, but typically include: research and design, inputs, production, distribution and marketing, and sales, and in some cases the recycling of products after use. This input-output structure involves goods and services, as well as a range of supporting industries. The input-output structure is typically represented as a set of value chain boxes connected by arrows that show the flows of tangible and intangible goods and services, which are critical to mapping the value added at different stages in the chain, and to layering in information of particular interest to the researcher (e.g., jobs, wages, gender, and the firms participating at diverse stages of the chain).

In order to understand the entire chain, it is crucial to study the evolution of the industry, the trends that have shaped it, and its organization. Based on general knowledge about the industry, segments of the chain can be identified and differentiated by the value they add to the product or service. The researcher further develops this chain using secondary data and interviews. The role of the researcher is to link these pieces of information and create a united and self-explanatory chain that includes the principal activities of the industry. The segments of the chain illustrate how different value adding processes contributed to the product or service, and in turn, the differing returns netted for the chain actors behind them.

Diagrams are extremely useful to illustrate the findings. For example, the fruit and vegetables global value chain is comprised of the following segments:

Figure 2. Fruit and Vegetables Global Value Chain Segments

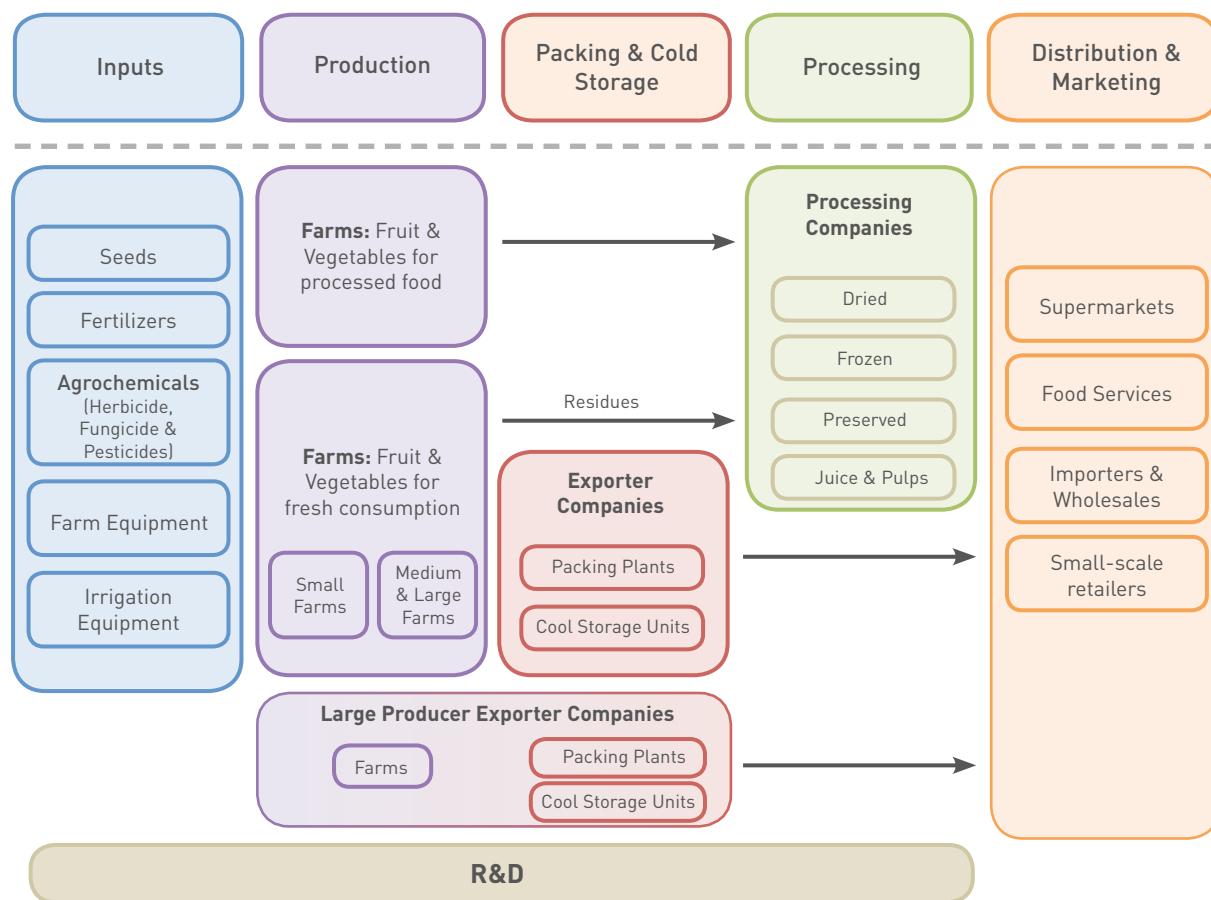


**b. Identify the dynamic and structure of companies under each segment of the value chain.**

Each of the segments identified in the previous step have specific characteristics and dynamics, such as particular sourcing practices or preferred suppliers. For example, in the fruits and vegetable value chain, the inputs for the “processing” segment may come from fruits that were intended for export but did not meet the quality controls or it may come from production grown exclusively for processing. It is important to identify the type of companies involved in the industry and their key characteristics: global or domestic; state-owned or private; large, medium, or small; etc. Identifying the firms that participate in the chain will help to understand its governance structure (this dimension will be explained later).

Under the production, distribution and marketing segments, the main producers of fresh produce and the final buyers in the chain are listed in Figure 3.

**Figure 3. Fruit and Vegetables Global Value Chain**



## 2. Geographic Scope

The globalization of industries has been facilitated by improvement in transportation and telecommunications infrastructure and driven by demand for the most competitive inputs in each segment of the value chain. Today, supply chains are globally dispersed and different activities are usually carried out in different parts of the world. In the global economy, countries participate in industries by leveraging their competitive advantages in assets. Usually developing countries offer low labor costs and raw materials, while rich nations, with highly educated talent, are behind R&D and product design. As a result, firms and workers in widely separated locations affect one another more than they have in the past (globalvaluechains.org, 2011).

Geographical analysis is first based on the analysis of global supply and demand. This is done by analysing the trade flows at each stage of the value chain using international trade statistics databases such as United Nations Comtrade and information compiled using secondary sources of firm-data, industry publications and interviews with industry experts.

One of the main contributions of GVC analysis has been to map the shifts in the geographic scope of global industries. However, GVCs operate at different geographic scales (local, national, regional, and global) and they continue to evolve. New evidence suggests there may be a trend toward a regionalization of GVCs in response to a variety of factors, including the growing importance of large emerging economies and regional trade agreements.

## 3. Governance

Governance analysis allows one to understand how a chain is controlled and coordinated when certain actors in the chain have more power than others. Gereffi (1994, p. 97) defined governance as "authority and power relationships that determine how financial, material and human resources are allocated and flow within a chain." Initially in the global commodity chains framework, governance was described broadly in terms of "buyer-driven" or "producer-driven" chains (Gereffi, 1994). Analysis of buyer-driven chains highlights the powerful role of large retailers, such as Walmart and Tesco, as well as highly successfully branded merchandisers (e.g., Nike, Reebok), in dictating the way the chains operate by requiring suppliers to meet certain standards and protocols, despite limited or no production capabilities. In contrast, producer-driven chains are more vertically integrated along all segments of the supply chain and leverage the technological or scale advantages of integrated suppliers. Understanding governance and how a value chain is controlled facilitates firm entry and development within global industries. In practice, governance analysis requires identification of the lead firms in the sector, their location, how they interact with their supply base and their source of influence and power over them (e.g. standards compliance).

A more elaborate typology of five governance structures has been identified in the GVC literature: markets, modular, relational, captive, and hierarchy (see Figure 4). These structures are measured and determined by three variables: the complexity of the information shared between actors in the chain; how the information for production can be codified; and the level of supplier competence (Frederick & Gereffi, 2009; Gereffi et al., 2005).

**Market:** Market governance involves transactions that are relatively simple. Information on product specifications is easily transmitted, and suppliers can make products with minimal input from buyers. These arms-length exchanges require little or no formal cooperation between actors and the cost of switching to new partners is low for both producers and buyers. The central governance mechanism is price rather than a powerful lead firm.

**Modular:** Modular governance occurs when complex transactions are relatively easy to codify. Typically, suppliers in modular chains make products to a customer's specifications and take full responsibility for process technology using generic machinery that spreads investments across a wide customer base. This keeps switching costs low and limits transaction-specific investments, even though buyer-supplier interactions can be very complex. Linkages (or relationships) are more substantial than in simple markets because of the high volume of information flowing across the inter-firm link. Information technology and standards for exchanging information are both key to the functioning of modular governance.

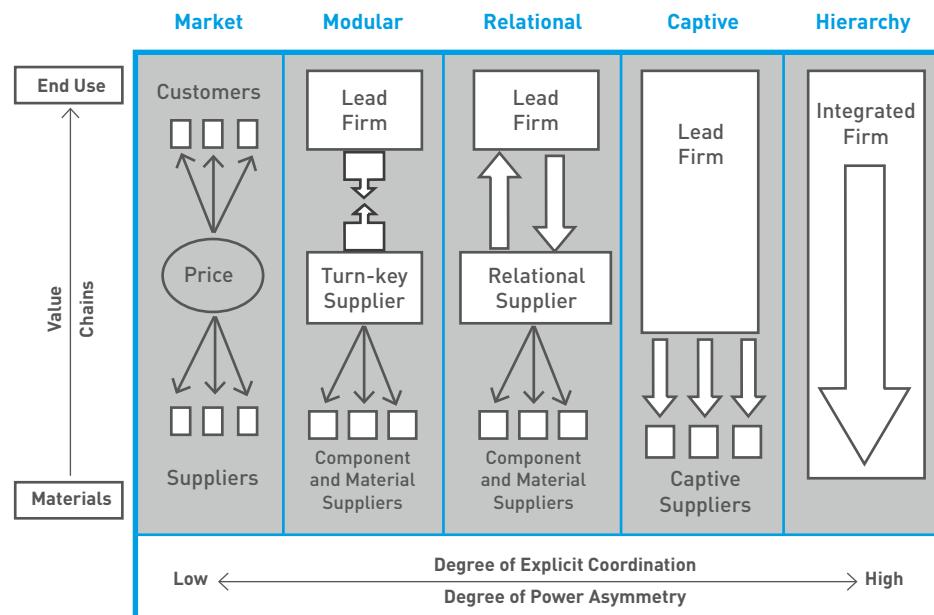
**Relational:** Relational governance occurs when buyers and sellers rely on complex information that is not easily transmitted or learned. This results in frequent interactions and knowledge sharing between parties. Such linkages require trust and generate mutual reliance, which are regulated through reputation, social and spatial proximity, family and ethnic ties, and the like. Despite mutual dependence, lead firms still specify what is needed, and thus have the ability to exert some level of control over suppliers. Producers in relational chains are more likely to supply differentiated products based on quality, geographic origin or other unique characteristics. Relational linkages take time to build, so the costs and difficulties required to switch to a new partner tend to be high.

**Captive:** In these chains, small suppliers are dependent on one or a few buyers that often wield a great deal of power. Such networks feature a high degree of monitoring and control by the lead firm. The power asymmetry in captive networks forces suppliers to link to their buyer under conditions set by, and often specific to, that particular buyer, leading to thick ties and high switching costs for both parties. Since the core competence of the lead firms tends to be in areas outside of production, helping their suppliers upgrade their production capabilities does not encroach on this core competency, but benefits the lead firm by increasing the efficiency of its supply chain. Ethical leadership is important to ensure suppliers receive fair treatment and an equitable share of the market price.

**Hierarchy:** Hierarchical governance describes chains characterized by vertical integration and managerial control within lead firms that develop and manufacture products in-house. This usually occurs when product specifications cannot be codified, products are complex, or highly competent suppliers cannot be found. While less common than in the past, this sort of vertical integration remains an important feature of the global economy.

The form of governance can change as an industry evolves and matures, and governance patterns within an industry can vary from one stage or level of the chain to another. In addition, recent research has shown that many GVCs are characterized by multiple and interacting governance structures, and these affect opportunities and challenges for economic and social upgrading (Dolan & Humphrey, 2004; Gereffi, Lee, et al., 2009).

Figure 4. Five Global Value Chain Governance Types



## 4. Upgrading

Economic upgrading is defined as firms, countries or regions moving to higher value activities in GVCs in order to increase the benefits (e.g. security, profits, value-added, capabilities) from participating in global production (Gereffi, 2005b, p. 171).

Diverse mixes of government policies, institutions, corporate strategies, technologies, and worker skills are associated with upgrading success. Within the GVC framework, Humphrey and Schmitz (2002) identified four types of upgrading:

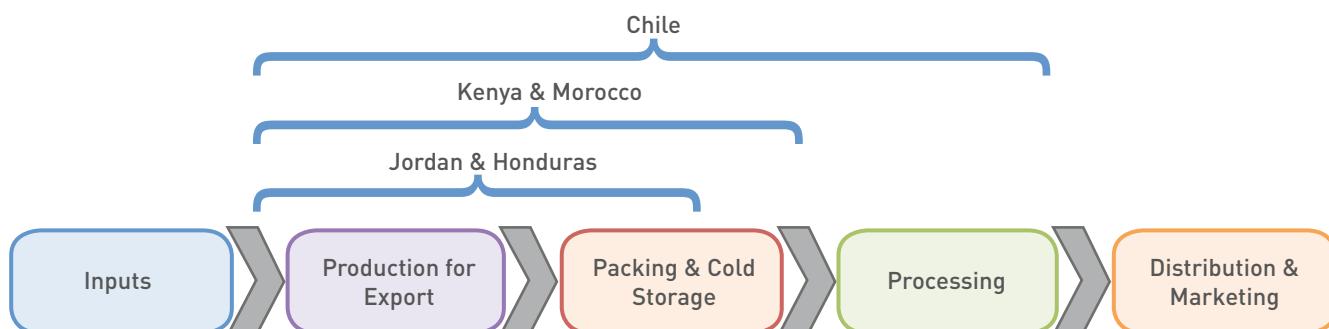
- process upgrading, which transforms inputs into outputs more efficiently by reorganizing the production system or introducing superior technology;
- product upgrading, or moving into more sophisticated product lines;
- functional upgrading, which entails acquiring new functions (or abandoning existing functions) to increase the overall skill content of the activities;
- chain or inter-sectoral upgrading, where firms move into new but often related industries.

Furthermore, Fernandez Stark et al. (2014) identified several additional types of upgrading:

- entry in the value chain, where firms participate for the first time in national, regional or global value chains. This is the first and one of the most challenging upgrading trajectories;
- backward linkages upgrading, where local firms (domestic or foreign) in one industry begin to supply tradable inputs and/or services to companies –usually MNCs- that are located in the country and are already inserted in a separate GVC;
- end-market upgrading, which can include moving into more sophisticated markets that require compliance with new, more rigorous standards or into larger markets that call for production on a larger scale and price accessibility.

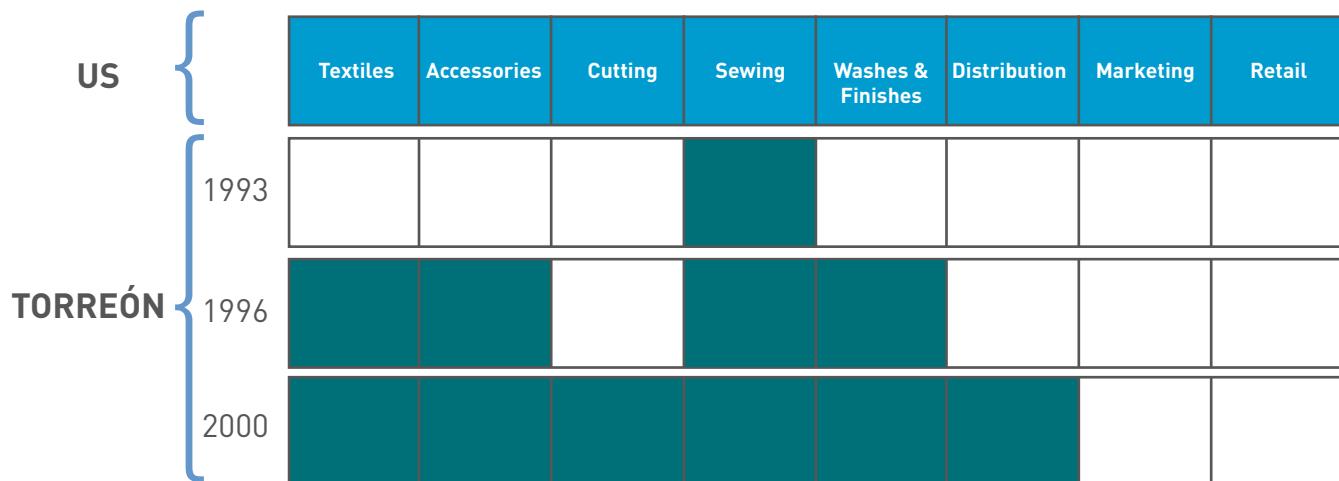
Upgrading patterns differ by both industry and country based on the input-output structure of the value chain and the institutional context of each country. Certain industries require linear upgrading and countries must gain expertise in one segment of the value chain before upgrading into the next segment, as shown below for countries involved in the horticulture value chain (see Figure 5).

**Figure 5. Upgrading Stages of Selected Countries in the Fruit and Vegetables Value Chain**



The apparel industry is a classic case that has been used to illustrate different upgrading and downgrading trajectories, since a large number of countries have been significant apparel exporters from the 1970s until the present (Gereffi, 1999; Gereffi & Frederick, 2010). Apparel suppliers in Torreon, Mexico initially entered the **blue jeans industry**<sup>1</sup> in the assembly stage of the value chain, but they quickly developed expertise in providing trim and labels, and distinct washes and finishes. By 2000, operations based in Torreon had also developed expertise in distribution, shipping their product directly to the point of sale. Figure 6 illustrates the region's upgrading trajectory into new higher value added segments of the apparel value chain between 1993 and 2000.

**Figure 6. U.S.- Torreon Apparel Value Chain: Activities and Location**



Source: Bair & Gereffi, 2001.

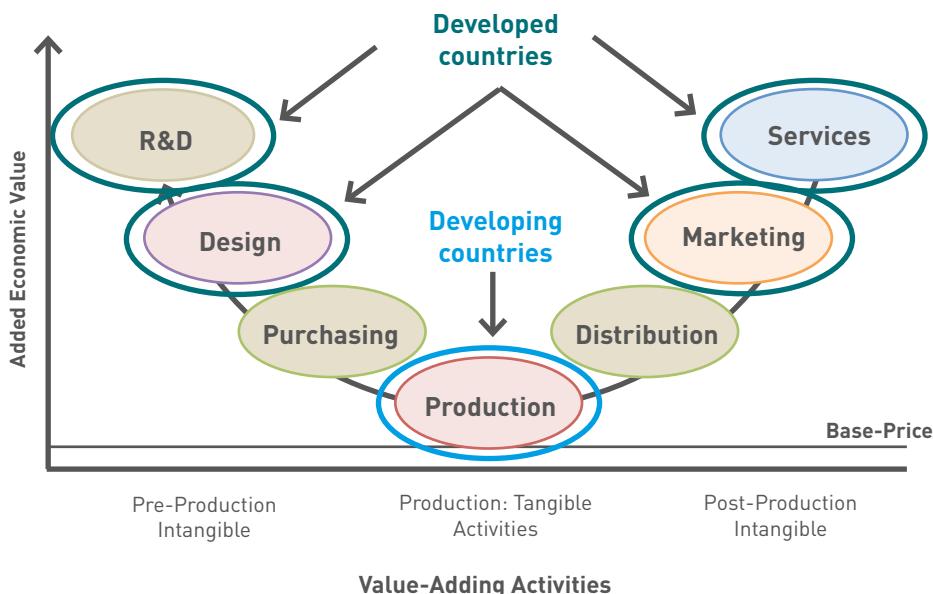
In 1993, only four U.S. manufacturers—Farah, Sun Apparel, Wrangler, and Levi Strauss & Co.—had a significant presence in Torreon. By 2000, the number of export customers grew to more than two dozen. In the early 1990s, the assembly plants on the Mexican side of the border received cut parts from U.S. manufacturers or brokers. These cut parts were sewn into garments and then re-exported to the United States under the “maquila” regime, which allowed tariff-free inputs to be sent from the United States to Mexico as long as they were included in Mexican production for re-export to the United States. Brand marketers and retailers “pulled” Mexican firms to increase their production volumes and the range of activities performed.

Upgrading thus occurred at the firm level in Torreon, in conjunction with the increasing demands of U.S. buyers for full-package production. However, the full-package model did not guarantee long-term success. Blue jean exports from Torreon slumped with the decline in U.S. export demand after 2000, and apparel employment in Torreon, which rose from 12,000 jobs in 1993 to an estimated 75,000 jobs in 2000, declined to 40,000 in 2004. Maintaining a role in the U.S. market in the face of stiff competition from China and other international suppliers required Torreon’s blue jeans cluster to continue to upgrade beyond OEM to the OBM and ODM<sup>2</sup> stages of the value chain through the development of local brands, regional marketing directly to U.S. buyers, and the establishment of a local design center in the region (Gereffi, 2005a).

The challenge of economic upgrading in GVCs is to identify the conditions under which developing and developed countries and firms can “climb the value chain” from basic assembly activities using low-cost and unskilled labor to more advanced forms of “full package” supply and integrated manufacturing. However, increasingly many of the highest value activities are located in pre- and post-production manufacturing services, which challenge host countries to develop appropriate workforce development strategies to supply these services locally. As seen in Figure 7, developed countries usually have a presence in high value added activities, while developing countries concentrate in lower value added activities.

<sup>1</sup>For more details see Bair and Gereffi (2001).

<sup>2</sup>OEM: Original Equipment Manufacturer; OBM: Original Brand Manufacturer; and ODM: Original Design Manufacturer.

**Figure 7. Smile Curve of High-Value Activities in Global Value Chains**

Source: Authors based on Baldwin et al., 2014; Shih, no date.

## 5. Local Institutional Context

The local institutional framework identifies how local, national and international conditions and policies shape a country's participation in each stage of the value chain (Gereffi, 1995). GVCs are embedded within local economic, social and institutional dynamics. Insertion in GVCs depends significantly on these local conditions. Economic conditions include the availability of key inputs: labor costs, available infrastructure and access to other resources such as finance; social context governs the availability of labor and its skill level, such as female participation in the labor force and access to education; and finally institutions includes tax and labor regulation, subsidies, and education and innovation policy that can promote or hinder industry growth and development.

Because global value chains touch down in many different parts of the world, the use of this framework allows one to carry out more systematic comparative (cross-national and cross-regional) analysis to identify the impact of different features of the institutional context on relevant economic and social outcomes.

## 6. Stakeholders Analysis

Analysis of the local dynamics in which a value chain is embedded requires examination of the stakeholders involved. All the industry actors are mapped in the value chain and their main role in the chain is explained. The most common stakeholders in the value chain are: companies, industry associations, workers, educational institutions, government agencies including export promotion and investment attraction departments, Ministries of foreign trade, economy and education amongst others. In addition, it is important to consider how relations between these actors are governed at the local level and which institutions are in a position to drive change. Thus, this type of analysis is critical to identify the key players in the value chain. It became especially relevant for industry upgrading recommendations and the development of an industry growth strategy in which each stakeholder plays a role to contribute in the development of the sector.

## >> IV. Recent applications of Global Value Chain Analysis

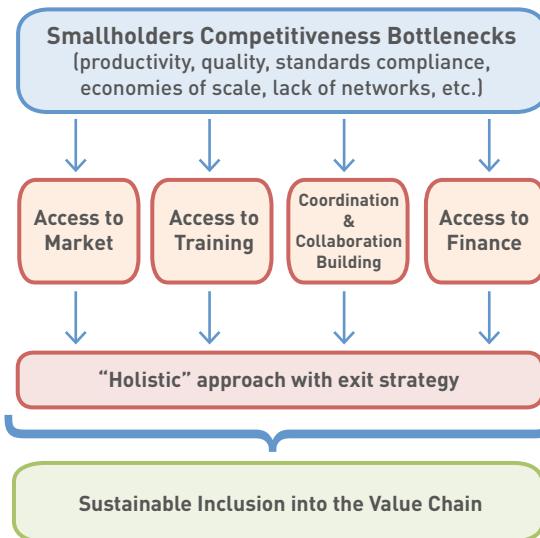
Originally GVC analysis was limited to research on competitiveness in manufacturing industries. Nowadays, this analysis has expanded in several directions to encompass emergent industries such as offshore services, inform industrial policy, guide opportunities to insert SMEs in the regional and global value chains, and embrace the links between economic and social upgrading such as workforce development. This section includes several examples of the increasingly diverse application of GVC analysis.<sup>3</sup>

### 1. SMEs Participation in Regional and Global Value Chains in Agro Industries<sup>4</sup>

The insertion of small- and medium-sized producers in national, regional and global high-value agriculture value chains has important consequences for poverty alleviation in rural areas of developing countries due to their potential to increase incomes and create employment (Weinberger & Lumpkin, 2007). However, the majority of smallholders in developing countries face a series of constraints that often limit their ability to participate competitively in these chains, and there has been considerable concern that these producers are being excluded from important growth opportunities.

The model outlined by Duke CGGC is intended to contribute to the international development community's understanding of how interventions can be more effectively designed to ensure sustainable inclusion of these small and medium size producers in the sector. Based on extensive primary and secondary research, with a focus on Inter-American Development Bank Multilateral Investment Fund (IDB-MIF) initiatives in Latin America, four major constraints were identified that limit the competitiveness of small- and medium-sized producers and their sustainable entry into value chains. A more detailed report (Fernandez-Stark et al., 2012) explains how project interventions can improve competitiveness factors and ensure that producers' inclusion in the value chain is based on a viable business case, rather than corporate social responsibility. Figure 8 summarizes a "holistic" model for inclusion that every intervention should consider.

**Figure 8. Model for Sustainable Smallholder Inclusion in High-Value Agro-food Chains**



Source: Fernandez-Stark et al., 2012.

3 For a broader mix of industries, see projects listed on the Duke CGGC website, <http://www.cggc.duke.edu/>

4 To obtain more information see: Fernandez-Stark & Bamber, 2012a, 2012b; Fernandez-Stark et al., 2012 or in the following link: <http://www.cggc.duke.edu/gvc/project.php?proj=135>

## >> Four-Pillars Model for Sustainable Inclusion of Small- and Medium-Sized Producers in the Value Chain

Based on a global value chain analysis, Duke CGGC proposes a holistic model that include four key “pillars” that address the major constraints that small- and medium-sized producers face: (1) Access to market; (2) access to training; (3) collaboration and cooperation building; and (4) access to finance.

This model is applicable to all levels of development. Beneficiaries with low capability levels will need longer interventions and usually all four pillars must be included in the intervention. Beneficiaries with higher levels of expertise may need support only in two of these areas as they already have managed to overcome constraints related to the other two areas. A summary of the four pillars model is presented in Figure 9. This model was developed for agricultural value chain; however it can be used in other industries since SMEs in different sectors face similar challenges.

**Figure 9. Four Pillars Model for SMEs participation in GVCs**



Source: Fernandez-Stark et al., 2012.

### Access to Market

Access to market is broadly relevant to inclusion in value chains. In the context of this model, it refers specifically to the presence of value chain linkages between producers and buyers and how they can be established. Traditionally, spot markets in agro-food sectors meant that no direct relationship was required between the producer and the buyer, and the producer sold his/her harvest to the highest bidder. However, the transformation of these sectors and the emphasis on food safety has heightened the need for specific product characteristics, control over production and traceability. Governance of the sector shifted from an arm's length interaction to a much closer relationship with the buyer dictating exactly what product is produced and under what conditions (Lee et al., 2012). The first stage of an intervention therefore requires establishing the link between producers and buyers. This connection requires educating buyers or lead firms regarding the business potential of sourcing from small producers, as well as facilitating interactions until the small producers are in a position to sustainably manage the relationship independently.

### Access to Training

While many small producers may have worked in agriculture their entire lives, specific training is often required to improve productivity and product quality, introduce new technologies and plant varieties, and comply with food safety and other certification requirements that govern entry into the national, regional and international value chains. Agro-food value chains today are very sophisticated and crops grown with traditional methods often do not meet the international market requirements. Skills development in agro-food value chains, however, has been generally underestimated in the past and the focus on training at the commercial level has only recently emerged (Fernandez-Stark et al., 2011a). Rural education levels in many developing countries are low and technical assistance run by the government are often understaffed and inadequately prepared to cater to the needs of increasingly demanding buyers (Fernandez-Stark et al., 2011a).

### Coordination and Collaboration Building

Coordination and collaboration building should occur at two levels. First, horizontal coordination amongst producers facilitates the formation of producer groups or associations, not only to reach needed economies of scale but also to provide opportunities to add value to their products (upgrading). Second, vertical coordination and collaboration involves interactions with other actors of the chain to establish linkages, find synergies and share information in order to improve the performance of the chain as a whole. Sustainable inclusion in value chains for small producers thus requires some form of organization in an ongoing way to achieve economies of scale.

#### Horizontal Coordination and Collaboration

Small- and medium-sized producers need economies of scale in order to compete in the marketplace. By definition, they lack the scale required to produce large quantities of any crop. The transaction costs of dealing with individual producers are high and it is not cost-effective or profitable for the buyer to work with producers on an individual basis. Self-organization is a difficult task to achieve for small- and medium-sized producers. Producers' commitment remains critical to successful engagement in a cooperative. Thus they often need the encouragement and support of external actors to understand and appreciate the payoffs of collective action and to establish themselves as formal, legal organizations.

#### Vertical Coordination and Collaboration

Coordination and collaboration amongst the chain stakeholders is crucial for chain performance and upgrading (Gereffi, Fernandez-Stark, Bamber, et al., 2011). Chain stakeholders include all the actors that play a role in the development of the industry, including producers, input providers, intermediaries, buyers, industry associations, training institutions, industry services providers, finance institutions, government agencies focused on the industry development, export promoting agencies and regulatory institutions. Promoting dialogue and public and private alliances has been very beneficial not only for resolving information asymmetries for smallholders, but also the industry advancement at local and country levels. These alliances provide insight into challenges and opportunities faced by the sector with the ultimate goal of coordinating and defining a common industry development strategy.

### Access to Finance

Entry into the value chain requires certain investments to cover infrastructure, equipment and obtaining certifications. Small producers, however, often face liquidity and credit constraints and have no access to formal finance channels, both of which limit their potential to make the required investments. Credit for small producers is constrained for a number of reasons, including high risk, asymmetrical information, lack of guarantees, dispersion in rural areas, and unfavorable economic policies. These credit constraints prevent small producers from investing in necessary equipment, such as irrigation systems, greenhouses or cold storage, to achieve productivity improvements, to develop unused portions of their land or to upgrade into higher value products, thereby limiting their potential to participate in coordinated value chains. Interventions can facilitate access to finance through various models.

## 2. Globalizing Service Sectors in the World Economy: Offshore Services<sup>5</sup>

The global value chain methodology has proven quite useful in the analysis of services. While the actual sequence of events from production to consumption of a service is short, GVC analysis allows for the incorporation of all of the services supplied within an industry, ranging from very simple tasks to highly sophisticated interactions in one chain. The example of offshore services illustrates how the GVC framework provides insight into a complex industry and serves as a guide for potential upgrading trajectories.

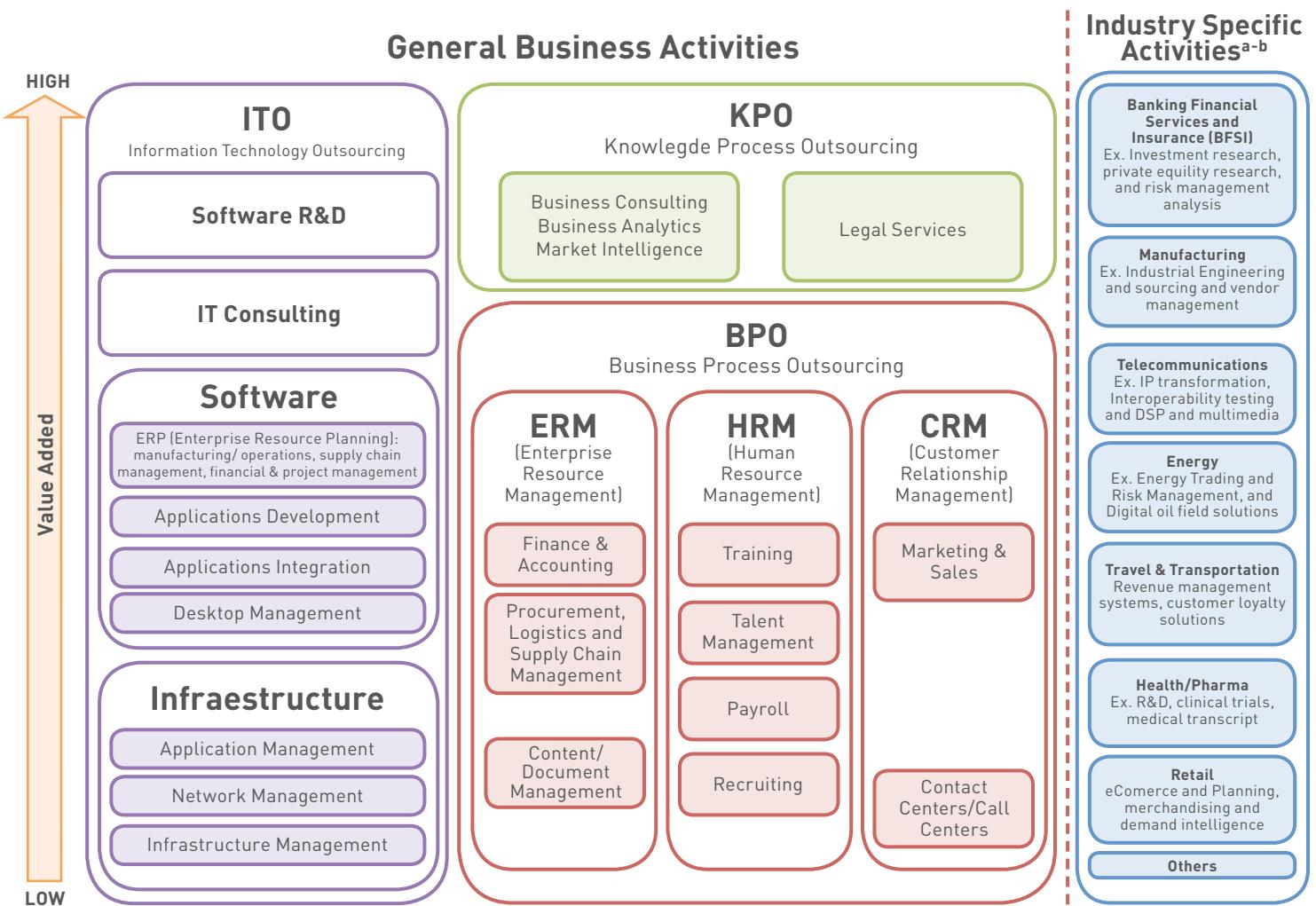
### Offshore Services

Structural changes in the world economy during the past decade facilitated the global outsourcing of multinational corporations (MNCs), thereby creating the offshore services industry, a new and rapidly growing sector in developing countries (Gereffi & Fernandez-Stark, 2010b, p. 1). Information technology (IT) now allows for quick and easy information transfers. Companies looking to improve their efficiency, reduce costs and increase flexibility, often unbundle their corporate functions, such as human resource management, customer support, accounting and finance, and procurement operations, and “offshore” these activities (Gospel & Sako, 2008; Sako, 2006). This reduces the burden of support activities and allows firms to focus on their core business. The increasing participation of developing countries in this new industry highlights the growing capabilities of the global South, not only at the production level but also in creating the knowledge behind products. For example Chile exports engineering services related to mining, India exports pharmaceutical R&D to lead MNCs and Uruguay exports sophisticated expertise on cattle traceability.

Duke CGGC has analyzed skill level and work experience to create an offshore services value chain, presented in Figure 10 below. The first categorization refers to three broad types of offshore services that can be provided across all industries (general business services): information technology outsourcing (ITO), business process outsourcing (BPO), and knowledge process outsourcing (KPO). The second categorization refers to services that are industry specific. Firms providing general business services tend to be process-oriented, while those in the vertical chains must have industry-specific expertise and their services may have limited applicability in other industries. For general business services, all activities are related to supporting generic business functions, such as network management, application integration, payroll, call centers, accounting, and human resources. In addition, they include higher-value services, such as market intelligence, business analytics, and legal services (referred to as KPO). Within these services, ITO contains a full spectrum of low- middle- and high-value activities of the offshore services chain; BPO activities are in the low and middle segments, while KPO activities are in the highest-value segment of the chain.

<sup>5</sup> For more information see Fernandez-Stark et al., 2011b. Additional information can be found on the CGGC website: [http://www.cggc.duke.edu/gvc/offshore\\_services\\_industry.php](http://www.cggc.duke.edu/gvc/offshore_services_industry.php).

Figure 10. The Offshore Services Global Value Chain



**NOTES:**

*a* Industry specific: Each industry has its own value chain. Within each of these chains, there are associated services that can be offshored. This diagram captures the industries with the highest demand for offshore services.

*b* This graphical depiction of industry specific services does not imply value levels. Each industry may include ITO, BPO and advanced activities.

Within the GVC framework, adapting this scheme to our case evidence, five principal upgrading trajectories can be identified from the 10 country case studies: Entry into the value chain; upgrading within the BPO segment; offering full package services; the expansion of IT firms into KPO services; and the specialization of firms in vertical industries. These five upgrading trajectories are presented in Figure 11.

These upgrading trajectories show different country strategies to move into higher value-added activities. These trajectories are not mutually exclusive and several of them can happen at the same time. The first trajectory shows how countries have typically entered the value chain, in particular in Latin America, where a common strategy has been to begin offering call center services. The second trajectory refers to countries that are able to offer more sophisticated business operations beyond call and contact centers. In trajectory three, providers move into the provision of knowledge activities that require a considerable degree of analysis. These analytical services demand a more qualified labor force. The fourth upgrading trajectory usually occurs when large operations are set up in a country and are able to offer a large spectrum of services ranging from low value-added to high value services. These operations offer a 'one stop shop' for clients and reduce overall transaction costs, but depend on the availability and cost-competitiveness of a large number of workers to serve different stages of the chain. Finally, the industrial specialization upgrading trajectory shows the movement to niche activities for specific industries. This expertise reduces vulnerability to competition from other low cost locations.

Figure 11. Examples of Upgrading Trajectories in the Offshore Services Value Chain

Entry into the Value Chain		<ul style="list-style-type: none"> <li>Common way to enter the offshore services value chain is through the establishment of call center operations.</li> <li>Opportunity for low-income countries to enter into the knowledge economy.</li> </ul> <p>Recent examples of countries entering the value chain through call centers include <b>El Salvador</b> (Dell, Sykes and Teleperformance), <b>Nicaragua</b> (Sitel), <b>Panama</b> (HP and Caterpillar) and <b>Guate-mala</b> (Exxon Mobil, ACS and 24/7 Customer) (Gereffi, Castillo, et al., 2009).</p>
Upgrading within the BPO Segment		<ul style="list-style-type: none"> <li>Companies expand their BPO services within the segment.</li> <li>Improving and expanding call centers operations or specialization in certain areas.</li> </ul> <p><b>South Africa</b> has been an important destination for BPO services currently employing around 87,000 people and growing at 33% per year. South Africa is actively working in expanding their BPO activities.</p>
Broad Spectrum Services (Functional Upgrading)		<ul style="list-style-type: none"> <li>Companies positioned in the ITO and KPO segments may opt to provide a more comprehensive range of activities and include BPO services.</li> <li>Acquisitions of smaller BPO firms and/or creating a new business unit within the company.</li> </ul> <p><b>India</b> has seen a number of firms in the IT and consulting (KPO) segment expand to the BPO sector. This is true for both big domestic firms like Infosys, Wipro and also foreign firms located in India like IBM and Accenture among others.</p>
Upgrading from ITO to KPO functions (Functional Upgrading)		<ul style="list-style-type: none"> <li>IT service firms include KPO activities in their portfolio.</li> <li>IT companies engage customers to find solutions for unsolved business problems .</li> </ul> <p>For example, between 2002 and 2005, <b>Indian</b> firms Infosys, Wipro, TCS and WNS amongst others developed and launched business consulting services practices.</p>
Industry Specialization (Intersectoral)		<ul style="list-style-type: none"> <li>Companies offering some ITO, BPO and KPO services for a wide range of industries start specializing and focus on key industries to develop expertise.</li> </ul> <p>The <b>Czech Republic</b>, which entered into the offshore services industry through the establishment of BPO shared services activities, has quickly upgraded into R&amp;D segments of vertical industries, particularly in the automotive, aerospace and IT areas.</p>

### 3. Workforce Development and Global Value Chains

Another illustration of new applications of the GVC analysis is the topic of workforce development. The International Labour Organization is using the GVC framework to understand the dimensions of production and employment during their 2016 convention (ILO, 2016). Duke CGGC has been a pioneer introducing the skills dimension into GVC analysis in the multi-industry study “Skills for Upgrading.”<sup>6</sup>

The participation of workers in GVCs can be viewed through the lens of job categories defined by skill level in order to understand the conditions of the workers in these chains and the challenges they face. Each skill level can be loosely associated with stages of the value chain (Gereffi, Fernandez-Stark, & Psilos, 2011).

**Table 1. Types of Work in Global Value Chains**

Job Category	Examples of Conditions of Work	Education Level	Examples
Informal SME or household work	May or may not be compensated; precarious conditions; unregulated work hours	Low; often less than primary education	Small producers in agricultural supply chains
Low skilled labor-intensive work	Formal; job insecurity, low wages, weak organization due to subcontracting	Low; often primary education or less	Workers on apparel or electronic assembly lines
Moderate skilled work	Formal; increased job security, potentially poor working hours	Completed secondary education	Procurement and logistics handling jobs in apparel and automobile chains
High skilled technology-intensive work	Formal; high job security, higher paid work, working hours & work-life balance challenges	Post-secondary technical education	Specialized component production and assembly in aerospace and medical devices chains
Knowledge-intensive work	Formal; potentially freelance, higher paid work, working hours & work-life balance challenges	Completed university education, including advanced degrees	Accounting, engineering and design jobs

Source: Gereffi et al., 2016.

Table 1 distinguishes five main types of jobs:<sup>7</sup>

#### i. Informal small and micro-enterprise or household-based work

Work in informal small and micro-enterprises or households can be found in many GVCs in developing countries and particularly in agriculture and light industries such as apparel. Production takes place in or around the household, with limited separation between commercial productive activity (i.e., making saleable goods) and unpaid reproductive activity (e.g., household subsistence and childcare). Income derived from these activities is generally low, and production involves both paid and unpaid family labour often including child labour. Education levels vary, but often are very low. Long working hours or health and safety conditions can be precarious. In addition, fragmentation of the labor force across a large number of small firms weakens the potential for any collective activity (Bamber & Fernandez-Stark, 2013).

<sup>6</sup> “Skills for Upgrading” book link: [http://www.cggc.duke.edu/pdfs/Skills-for-Upgrading-Workforce-Development-and-GVC-in-Developing-Countries\\_FullBook.pdf](http://www.cggc.duke.edu/pdfs/Skills-for-Upgrading-Workforce-Development-and-GVC-in-Developing-Countries_FullBook.pdf)

<sup>7</sup> This scheme is based on Barrientos et al. (2011) and Gereffi, Fernandez-Stark et al. (2011). This classification scheme is not intended to refer to all jobs in the global economy; rather, it only applies to jobs linked to the offshore production of goods and services.

## ii. Low-skilled, labour-intensive work

Labour-intensive production uses waged labor in a formal setting. It involves a relationship between an employer (who may be the producer or an agent) and a worker, based on a wage. This relationship may be temporary or permanent based on a work contract. In this type of work, it is not uncommon for a core workforce to be on permanent contracts, complemented by temporary workers (often women and migrants) who are hired according to fluctuations in demand (Barrientos et al., 2011; Lee & Gereffi, 2015). The engagement of temporary workers through sub-contracting arrangements in part fragments this group of workers, making organization of labor difficult (Barrientos, 2013). Workers engaged in these stages of value chains typically have up to six years of education. Access to low-cost labor for labor-intensive production was one of the primary drivers of early offshoring, and accounts for a very large share of global employment in value chains.

## iii. Moderate-skilled work

Moderate-skilled work is associated with production that requires specific technical knowledge, such as machine operators and pattern makers, often in capital- and technology-intensive supply chains, such as automobiles and electronics. Work is typically formal in nature, and these workers usually have completed secondary education. Depending on skills supply in the specific labor market, these workers may hold permanent contracts due to investment that must be made by the firm in training on specific equipment required to perform core operations. A skills shortage can lead to long working hours. Unionization and other collective action are dependent on the local institutional context.

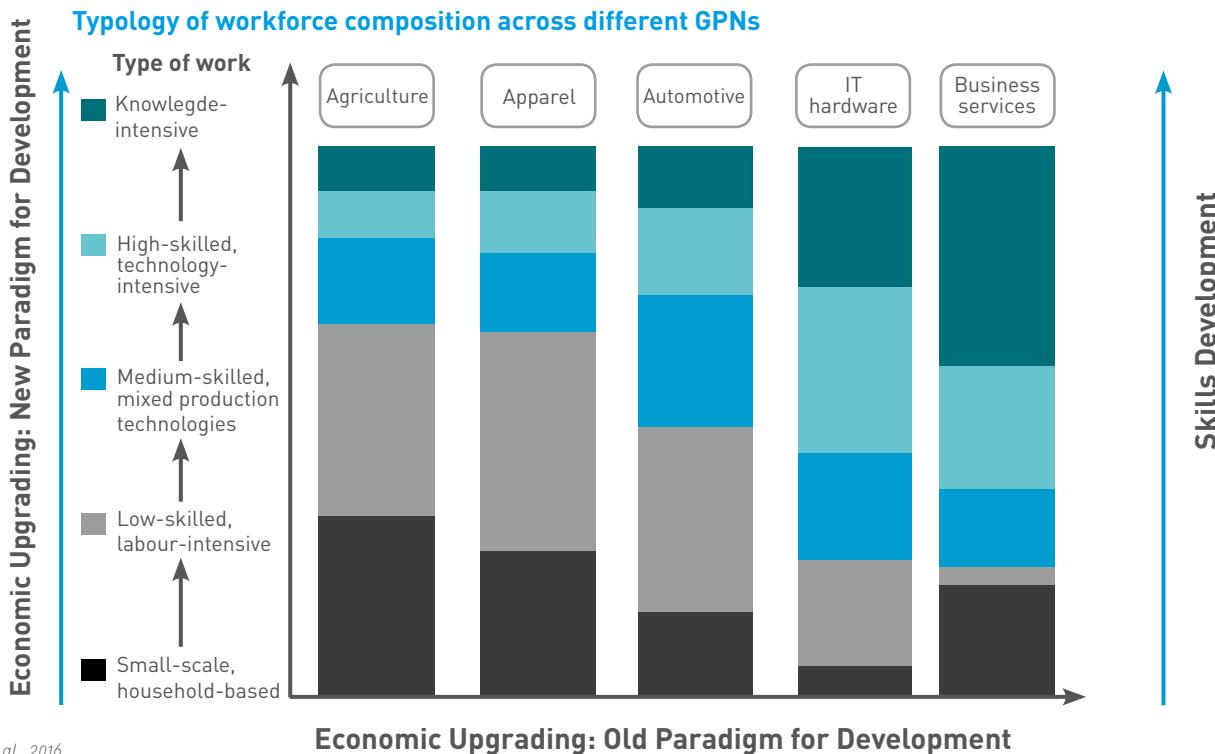
## iv. High-skilled, technology-intensive work

The offshoring of high-skilled, technology-intensive work emerged in the 1980s and 1990s. Lead firms in capital- and technology-intensive sectors, such as automobiles and electronics, set up international production networks not only to assemble their finished goods, but also to develop a supply base for key intermediate items and sub-assemblies. Due to the capital and technology intensive nature of this work, this accounts for a smaller share of employment in GVCs. At the uppermost tiers of these production networks, the suppliers tend to concentrate 'good' jobs in relatively few locations. Skill scarcity can contribute to improved wages and employment terms, but may also involve long working hours and poor work-life balance. Workers in these activities generally have completed at least post-secondary technical education.

## v. Knowledge-intensive work

Knowledge-intensive work opportunities have been created by a new wave of offshoring in services (Gereffi and Fernandez-Stark 2010). Knowledge-intensive service jobs include advanced business services, such as finance, accounting, software, medical services and engineering, and are increasingly seen as an opportunity for developing economies to attain both economic and social benefits, with technological learning, knowledge spillovers and higher income. Workers in this category may choose freelance work over permanent contracts to provide them with flexibility, but with lower levels of social protection. On average, the size of employment in this work category is relatively small considering the requirements for high skills and advanced degrees. Skills surplus in this category in developing countries can lead to loss of motivation at work and 'brain drain' (OECD, 2013).

Figure 12 shows graphically how these five types of work and skill levels are distributed across different GVCs.

**Figure 12. Workforce Composition Across Different GVCs**

Source: Gereffi et al., 2016.

The composition of a country's workforce in GVCs changes as it undergoes economic upgrading. Two dimensions of economic upgrading can be highlighted: traditional development paradigms that stress 'structural transformation' from primary projects to manufacturing and service jobs in the economy (shifting from left to right on the figure); and the new 'GVC paradigm' of upgrading to higher value activities within any specific industry (moving from the bottom to top of each column) (Gereffi, Fernandez-Stark, & Psilos, 2011; Taglioni & Winkler, 2016).

In the past five years, Duke CGGC has been working to understand workforce development issues using the GVC methodology. This undertaking incorporated a multi-industry and multi-country analysis of upgrading trajectories and workforce initiatives that helped to drive these shifts. The sectors and countries selected in a pioneer study conducted by Duke CGGC were: (1) fruit and vegetables (Chile, Kenya, Morocco, Jordan and Honduras); (2) apparel (Turkey, Sri Lanka, Bangladesh, Nicaragua and Lesotho); (3) offshore services (India, the Philippines, Chile and Central American countries); and (4) tourism (Costa Rica, Vietnam and Jordan).

In each segment of these value chains, Duke CGGC found that workers required specific skills that frequently are regulated by global rather than local actors. As an illustration, Figure 13 below summarizes workforce development implications in the offshore services value chain. Developing countries in offshore services are engaging in market-driven development—acquiring capabilities to upgrade services (providing better services, expanding the number of services or/and offering higher value added services)—through significant investments in workforce training and managerial capabilities, provided initially by private offshore service providers but now increasingly supported by an expanded range of public, private, and multi-sector initiatives. Far from a race to the bottom, involvement in the offshore services industry has provided developing country workers, firms, and governments with an attractive opportunity to build the skill-based competencies required to meet the demands of global service markets.

Figure 13 Examples of Upgrading Trajectories in the Offshore Services Value Chain and Workforce Development Initiatives

Type	Diagram	Workforce Development Initiatives
Entry into the Value Chain		<p>• Call centers hire people with high school diplomas or bachelor's degrees. • Further skills training is provided by the company.</p> <p>In Guatemala, inter-institutional alliances were created to promote call center and BPO skills training. Intecap, a technical training institution funded through a 1% levy on salaries has been central to these initiatives (ECLAC, 2009).</p> <p><b>Type of skills preparation      Institutions involved</b></p> <ul style="list-style-type: none"> <li>• Short training                  • Private sector • Government</li> </ul>
Upgrading within the BPO Segment (Functional Upgrading)		<p>• Skills development is carried out by the private sector, either through in-house or contracted training programs. • Educational institutions and governments help to develop course content and provide scholarships.</p> <p>In South Africa, the government created the BPO Support Programme to generate more jobs. The program includes training for 35,000 direct jobs and 4,000 in middle management.</p> <p><b>Type of skills preparation      Institutions involved</b></p> <ul style="list-style-type: none"> <li>• Short Training                  • Private sector • Formal education (degree required) • Government                     • Tertiary educational institutions</li> </ul>
Full Package Services (Functional Expansion)		<p>• Expansive hiring process targets candidates with high school diploma and/or college graduates to work in this industry. • New hires must first complete BPO training programs to guarantee quality services. This refers to the same training offered in the "Upgrading within the BPO segment."</p> <p>In the early 2000s in India, there was a significant push into the BPO segment by ITO and KPO firms. Recruiting was the central aspect to this expansion, and firms focused particularly on hiring women from middle class background.</p> <p><b>Type of skills preparation      Institutions involved</b></p> <ul style="list-style-type: none"> <li>• Short training                  • Private sector • Formal education (degree required) • Government</li> </ul>

Type	Diagram	Workforce Development Initiatives				
Upgrading from ITO to KPO functions(Chain Upgrading)		<p>• Personnel with higher education qualifications recruited. Typically MBA graduates and workers with business experience. These workers must have sharp analytical skills.</p> <p>Legal Process Outsourcing requires qualified lawyers. By 2015, LPO will employ 17,000 professionals. These lawyers undergo similar training as in the US.</p> <table> <thead> <tr> <th>Type of skills preparation</th> <th>Institutions involved</th> </tr> </thead> <tbody> <tr> <td>• Formal education (degree required)</td> <td>• Tertiary educational institutions</td> </tr> </tbody> </table>	Type of skills preparation	Institutions involved	• Formal education (degree required)	• Tertiary educational institutions
Type of skills preparation	Institutions involved					
• Formal education (degree required)	• Tertiary educational institutions					
Vertical Specialization (Chain Upgrading)		<p>• Companies hire area experts to sustain their competitive advantage in specific areas.</p> <p>• For example, a BPO company providing medical transcription services must hire nurses and doctors to ensure accurate service provision.</p> <p>In the Czech Republic, the government has been incentivizing advanced degrees such as Masters and PhD degrees. Masters students accounted for 40% of the university student population. Today there are more than 73,000 technical university students engaged in R&amp;D in different areas.</p> <table> <thead> <tr> <th>Type of skills preparation</th> <th>Institutions involved</th> </tr> </thead> <tbody> <tr> <td>• Formal education (degree required) • Usually MA and PhD degrees</td> <td>• Tertiary educational institutions</td> </tr> </tbody> </table>	Type of skills preparation	Institutions involved	• Formal education (degree required) • Usually MA and PhD degrees	• Tertiary educational institutions
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Process Upgrading		<p>• Companies undertake process improvements to upgrade their global capabilities.</p> <p>For example, Siemens has specific strategies for organizational training on CMMI (one of the most popular process improvement certification in this industry). The strategy consists on defining the job skills necessary, assess who need the training, train workers with skill gaps, record progress and monitor new skills gaps.</p> <table> <thead> <tr> <th>Type of skills preparation</th> <th>Institutions involved</th> </tr> </thead> <tbody> <tr> <td>• Internal training</td> <td>• Private sector • Certification Institutes (on-site or online)</td> </tr> </tbody> </table>	Type of skills preparation	Institutions involved	• Internal training	• Private sector • Certification Institutes (on-site or online)
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## 4. Informing Governments to Design Industrial Policies

Global value chain analysis has proven to be an effective tool to advise country governments on economic development and specific policies for industry upgrading regarding productive capacity, infrastructure and services, business environment, trade and investment policies and industry institutionalization. This methodology is widely used by nations in all regions of the globe to identify the various local factors that affected the capacity of developing countries to meet GVC requirements (Bamber et al., 2013).

Duke CGGC has conducted a number of GVC studies commissioned by country governments in all major regions of the world. For example, the Costa Rica government commissioned a global value chain study with the objective to provide a set of recommendations to the country to enhance the participation and upgrading in selected industries: medical devices (Bamber & Gereffi, 2013b), electronics (Frederick & Gereffi, 2013), aerospace (Bamber & Gereffi, 2013a) and offshore services (Fernandez-Stark et al., 2013).<sup>8</sup> To that end, the global value chain framework is used to understand the changing dynamics of these industries at a global level, to identify Costa Rica's position in these chains, and to highlight potential competitiveness opportunities.

Understanding how GVCs operate is essential for a country, such as Costa Rica, which relies significantly on export-oriented foreign direct investment (FDI) for economic growth. The evolution of these GVCs has significant implications in terms of global trade, production and employment, and how developing countries integrate into the global economy. By gaining access to developed country markets, participation in GVCs offers emerging economies an opportunity to add value to their local industries. Insertion and sustained participation in GVCs can be paramount for the economic growth, particularly in developing nations, due to accompanying job creation potential, inflow of foreign currency, contributions to poverty reduction, and more recently, access to the global knowledge economy. Understanding these chains is critical for attracting foreign investment and also supporting the competitive growth of local firms. These firms must compete with a growing number of foreign firms not only for the local market, but also for international clients and thus are forced to improve the efficiency and quality of their operations. Below we present a summary of two industries analyzed in the Costa Rica study: medical devices and offshore services.

### a. Costa Rica and the Medical Devices Global Value Chain<sup>9</sup>

As part of Costa Rica's economic diversification efforts, the medical devices cluster is arguably the most successful industry that has been developed in the country under this FDI-driven, high-tech export strategy. The Costa Rican medical devices industry dates to 1985, when the first device company established operations in the country. By 2014, exports had reached US\$1.4 billion. Accounting for 12% of the country's total exports, medical devices became the largest export industry in the country (UN Comtrade, 2015). In 2015, more than 50 firms were participating in the medical device supply chain in Costa Rica, with an additional 16 companies providing packaging and support services. Over half (60%) of these firms were from the United States and less than 30% were Costa Rican. Companies in the sector are concentrated in the production segments of the value chain, with 70% of them manufacturing components or assembling final goods (Bamber & Gereffi, 2013b).

<sup>8</sup> Costa Rica GVC studies can be found at:  
<http://www.cggc.duke.edu/gvc/project.php?proj=180>.  
 For other studies check the Duke CGGC website.  
 Some recent reports include Peruvian GVCs analysis: Table grapes (Fernandez-Stark et al., 2016b), mining equipment (Bamber et al., 2016) and high quality cotton textiles and apparel (Fernandez-Stark et al., 2016a).

<sup>9</sup> The study Costa Rica in the Medical Devices Global Value Chain, can be found at:  
[http://www.cggc.duke.edu/pdfs/2013-08-20\\_Ch2\\_Medical\\_Devices.pdf](http://www.cggc.duke.edu/pdfs/2013-08-20_Ch2_Medical_Devices.pdf).  
 This study was also highlighted in a World Free Zones Organization bulletin (Gereffi, 2016).

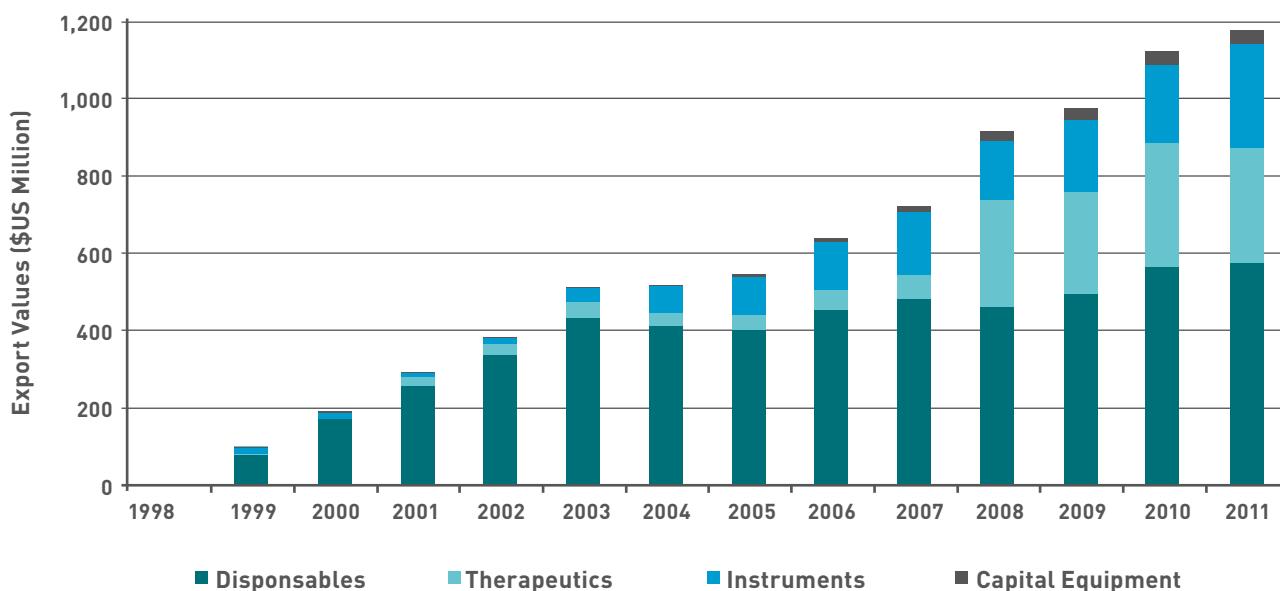
The growth of the medical devices sector created approximately 17,500 jobs in manufacturing between 2000 and 2015, with approximately 2,000 jobs being added each year since 2012. This job creation has provided opportunities for both men and

women; 45.6% of the workforce is male and 54.4% female (CINDE, 2012b). The medical devices industry relies on a highly skilled workforce. By 2012, 10-20% of the workforce was comprised of engineers and 10-15% technicians. The remaining 60-80% of direct production workers initially drew from the unskilled labor pool that had served the apparel sector (Bamber & Gereffi, 2013b).

Costa Rica's export performance in medical devices between 1998 and 2011 shows a very steady and significant growth in the overall quantity of exports from just under US\$400 million in 2002 to nearly \$1.2 billion in 2011 (Figure 14). In terms of upgrading dynamics, the country has undertaken functional upgrading and developed backward linkages. However, the most intriguing story is about product upgrading, shifting the composition of Costa Rica's medical device exports in terms of their technological content. In 2002, about 90% of Costa Rica's medical device exports were in the low-tech disposables category, but by 2011, the other three higher tech medical device categories accounted for more than half of the country's exports. Its main product segments vary considerably in technological complexity:

- Disposables: single use-products, such as bandages, catheters, surgical gloves, which are cost-driven.
- Medical Instruments: multi-use products like forceps and surgical scissors that are sterilized between uses with different patients.
- Therapeutic Devices: highly diverse products that may be implemented in the human body (e.g., orthopedic implants, pacemakers, hearing aids, etc.), which are subject to very high levels of international health and safety regulation and quality standards.
- Capital Equipment: large, long-term investments for complex, single-purchase machines that can be used repeatedly over the years, such magnetic resonance imaging or (MRI) equipment.

**Figure 14. Costa Rica Medical Exports by Product Category, 1998–2011**



As the technological content of exports evolved, the MNCs that have established operations in the country have also changed. Figure 15 disaggregates the firms that entered Costa Rica's medical devices sector into four waves: pre-2000, 2001-2004, 2005-2008, and 2009-2012.<sup>10</sup> A very clear pattern of FDI succession emerges: the companies that invested in Costa Rica pre-2000 were predominantly in the low-tech, cost-driven disposables product category. In each successive time period, companies with higher-level technology entered Costa Rica. When companies were asked during interviews why they came to Costa Rica, two factors were repeatedly mentioned: (a) latecomers were encouraged by the positive experiences of the earlier investors; and (b) the capabilities of Costa Rican managers, as well as skills upgrading by Costa Rican employees and local suppliers, made the country increasingly attractive to high-technology firms.

**Table 2. Firms in Costa Rica's Medical Devices Sector**

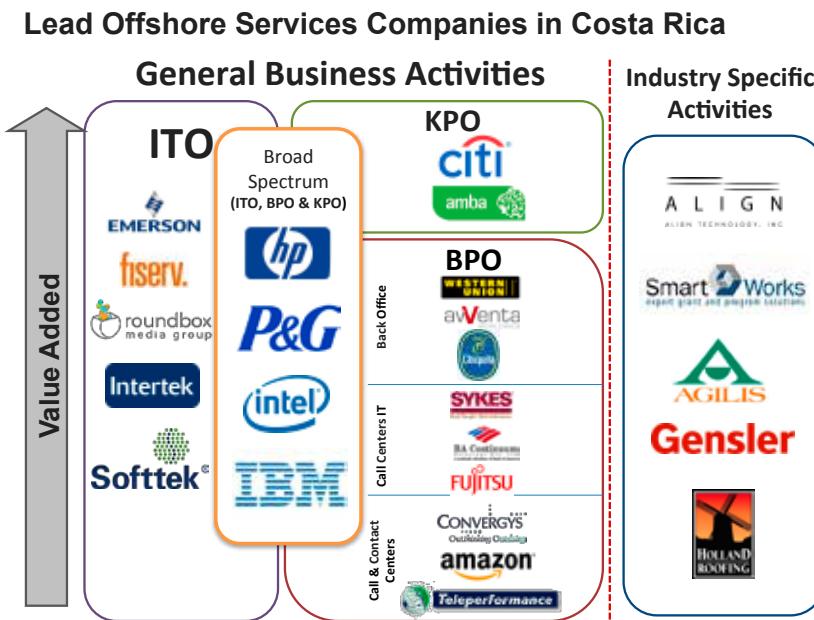
Entry Year	Firm Characteristics	Main Product Export Category	Core Market Segments	Product Examples	Select Firms
<b>Up to 2000</b> 24 firms: 8 US 15 CR 1 German	4 OEMs 8 Components 1 Input distributor 7 Packaging 1 Finishing 3 Support services	Disposables	Drug delivery; Women's health	Intravenous tubing (I) Mastectomy bra (I)	Hospira; Baxter; Amoena; Corbel
<b>2001–2004</b> 13 firms: 9 US 3 CR 1 Colombian	3 OEMS 6 Components 1 Finishing 1 Logistics provider 2 Support services	Instruments	Endoscopic surgery	Biopsy forceps (II)	Arthrocare; Boston Scientific; Oberg Industries
<b>2005–2008</b> 8 firms: 7 US 1 Puerto Rico	2 OEM 4 Components 1 Packaging 1 Finishing	Therapeutics	Cosmetic surgery; Women's health & urology	Breast implants (III) Minimally invasive devices for uterine surgery (II)	Allergan; Tegra Medical; Specialty Coating Systems
<b>2009–2012</b> 21 firms: 16 US 1 CR 1 Ireland 1 Japan 2 Joint ventures (US-CR)	5 OEMS 7 Components 2 Non-OEM assemblers 1 Input Distributor 2 Sterilization 2 Packaging	Therapeutics Disposables Instruments	Cardiovascular Drug delivery	Heart valves (III) Dialysis catheters (III) Guide wires (III) Compression socks (I)	Abbott Vascular St. Jude Medical Covidien Moog Synergy Health Volcano Corp.

Source: Bamber and Gereffi, 2013.

### b. Costa Rica in the Offshore Services Global Value Chain

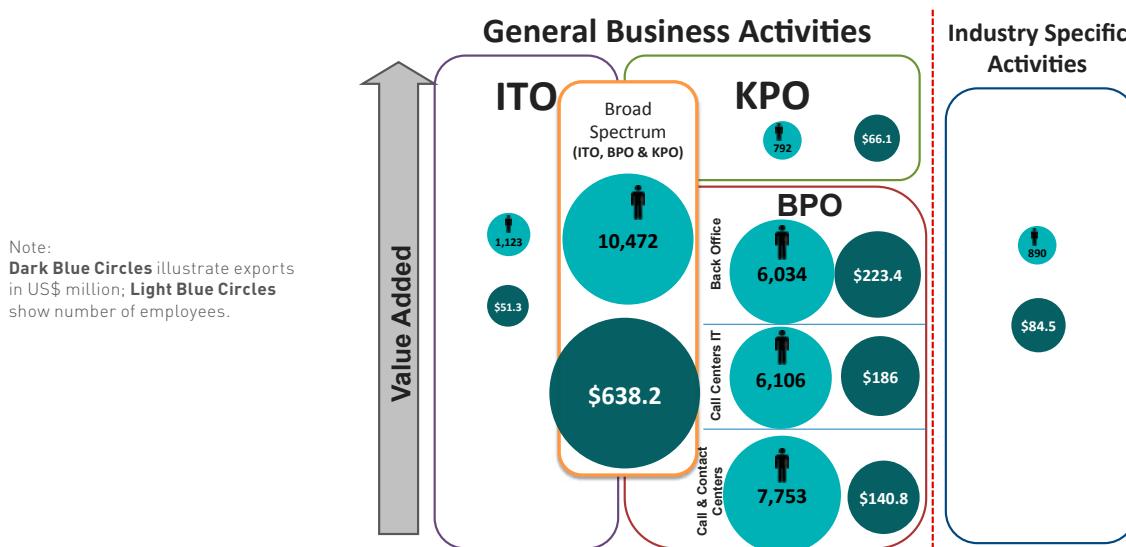
Costa Rica is a pioneer in attracting offshore services to Latin America. Since the mid-1990s the country has been a preferred location for multinational corporations (MNCs) looking to reduce costs and take advantage of the country's unique combination of draws, including its close location to the United States' Central Time Zone, largely bilingual population and relatively safe and stable security environment. MNCs have set up both captive centers and third party service providers in Costa Rica, with the latter allowing companies to use the country as a platform to export competitively priced services. Costa Rica entered the industry ahead of other countries in Latin America. This strategy gave the country an important "first mover advantage," allowing it to position itself as a key reference for offshore services in Latin America. As can be seen in figure 16 below, selected companies with presence in Costa Rica are mapped in the offshore services global value chain.

<sup>10</sup> This data was gathered from an analysis of FTZ statistics in Costa Rica and firm-level interviews by the authors of the Duke CGGC study.

**Figure 15. Offshore Services Industry in Costa Rica: MNCs participation by Segment, 2011**

Source: Fernandez-Stark et al., 2013.

In 2005, there were 33 MNCs firms employing 10,802 people and exporting around US\$387 million. These figures have tripled; in 2011 there were close to 100 offshore services MNCs operating in the country, employing 33,170 workers and exporting US\$1,390 million<sup>11</sup> (CINDE, 2012a). Since its entry into the offshore GVCs in the late 1990s, Costa Rica has both expanded its participation and upgraded through the value chain, providing increasingly sophisticated services. Figure 17 below shows exports and number of employees in the different segments of the offshore services global value chain.

**Figure 16. Offshore Services Industry in Costa Rica: US\$ Exports [Millions] and Number of Employees by Segment, 2011**

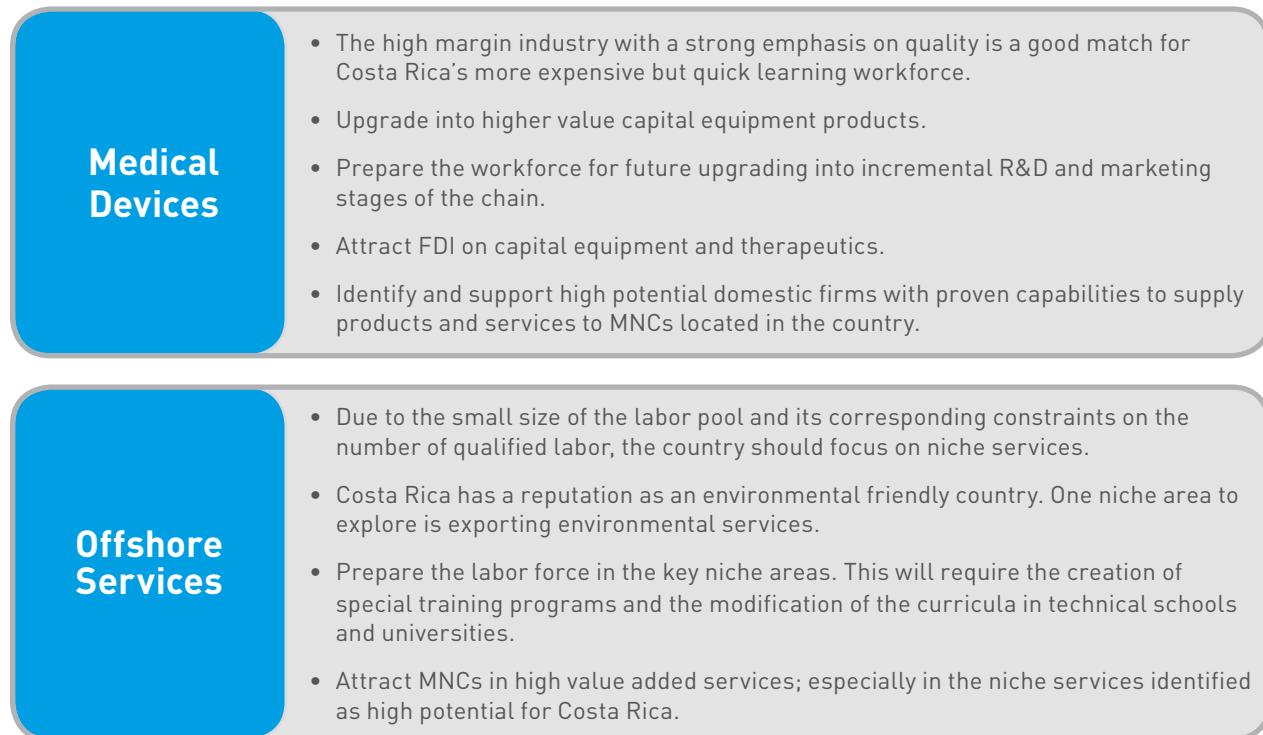
Source: Fernandez-Stark et al., 2013.

<sup>11</sup> This information is from MNCs operating in a free trade zone (FTZ) regime that represents around 80% of the total companies. According to CINDE, the Costa Rican Central Bank estimates that in 2011 the offshore services industry employed 37,049 and exported almost US\$1.6 billion. In this report we use the data from companies operating under the FTZ regime due to the data availability.

### c. Industrial Policy Recommendations

After the industry analysis, the Duke CGGC team provided a set of recommendations per sector analyzed and also transversal recommendations for the country. Some of the general recommendations are listed below:

**Figure 17. Policy Recommendations: Medical Devices and Offshore Services**



Source: Fernandez-Stark et al., 2013 and Bamber and Gereffi, 2013.

Through this analysis, several common factors requiring policy interventions were identified across these four industries. A transversal policy approach can be implemented in these areas to address these factors and to facilitate growth in all sectors analyzed. These themes align with the working groups in the Presidential Council for Competitiveness, and task groups could provide leadership in the following areas:

- Industry institutionalization
- Attraction of foreign direct investment
- Development of local firms
- Human capital development
- Improvements to the business environment
- Infrastructure upgrading

This set of recommendations was also complemented by country comparisons in which best practices were highlighted. These country cases illustrated examples of key policies to support industry upgrading. Best practices for this type of analysis are typically selected from countries that face related challenges and are in a similar stage of economic development.

## >> V. Conclusions

Globalization has given rise to a new era of international competition that is best understood by looking at the global organization of industries and how countries rise and fall within these industries. The global value chain framework has evolved from its academic origins to become a major paradigm used by a wide range of country governments and international organizations, including the World Bank, the International Labor Organization, the U.K. Department for International Development, and the U.S. Agency for International Development. Global value chain analysis highlights how new patterns of international trade, production, and employment shape the prospects for development and competitiveness, using core concepts like “governance” and “upgrading.”

On the governance side, global value chains are becoming more consolidated (Cattaneo et al., 2010). Large multinational manufacturers, retailers, and marketers who manage global sourcing networks are proclaiming that they want fewer, larger and more capable suppliers, and they will operate in a reduced number of strategic locations around the world. This is likely to promote a higher degree of regional sourcing, with suppliers located close to the major consumer markets in North America, Western Europe, and East Asia. In terms of upgrading, this offers some hope for small regional suppliers, but organizing efficient and sustainable value chains at the regional level remains challenging.

Today we are at a historic juncture. Decision-makers concerned with the role that GVCs play in promoting development face difficulties in adjusting to a world in which the primary drivers in global production and trade are emerging economies. Until recently, trade integration and growth in many developing countries were fueled by the insertion of local producers in GVCs feeding into high-income markets, in particular North America, Europe and Japan, and in chains led by firms from high-income economies. Recently, however, low growth or stagnation in the historically dominant Northern economies, along with sustained growth in emerging countries, in particular China and India, have spurred a shift in the primary trade and growth drivers with crucial implications for global demand, structures of production and innovation. In some cases, the shift in global demand to emerging economies has forced developing country suppliers to sell final goods at cheaper prices and lower level of processing than in the past, which amounts to downgrading in terms of their participation in the global economy (Kaplinsky & Farroki, 2011).

These new developments represent a potential change in the center of gravity for economic growth, with significant implications for GVCs, employment and innovation, and the strategy of governments and firms in developing countries. Globalization's benefits will continue to be unevenly distributed, with its gains going to those with more education, skills, wealth, and power. However, the inclusion of large emerging economies like China, India, Brazil and Mexico among those who are benefitting, at least in part, is a qualitative shift in the process. But it does not necessarily improve the chances for smaller countries in the global economy unless they devise policies to enhance their own capabilities to foster development.

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**Second Edition >>**

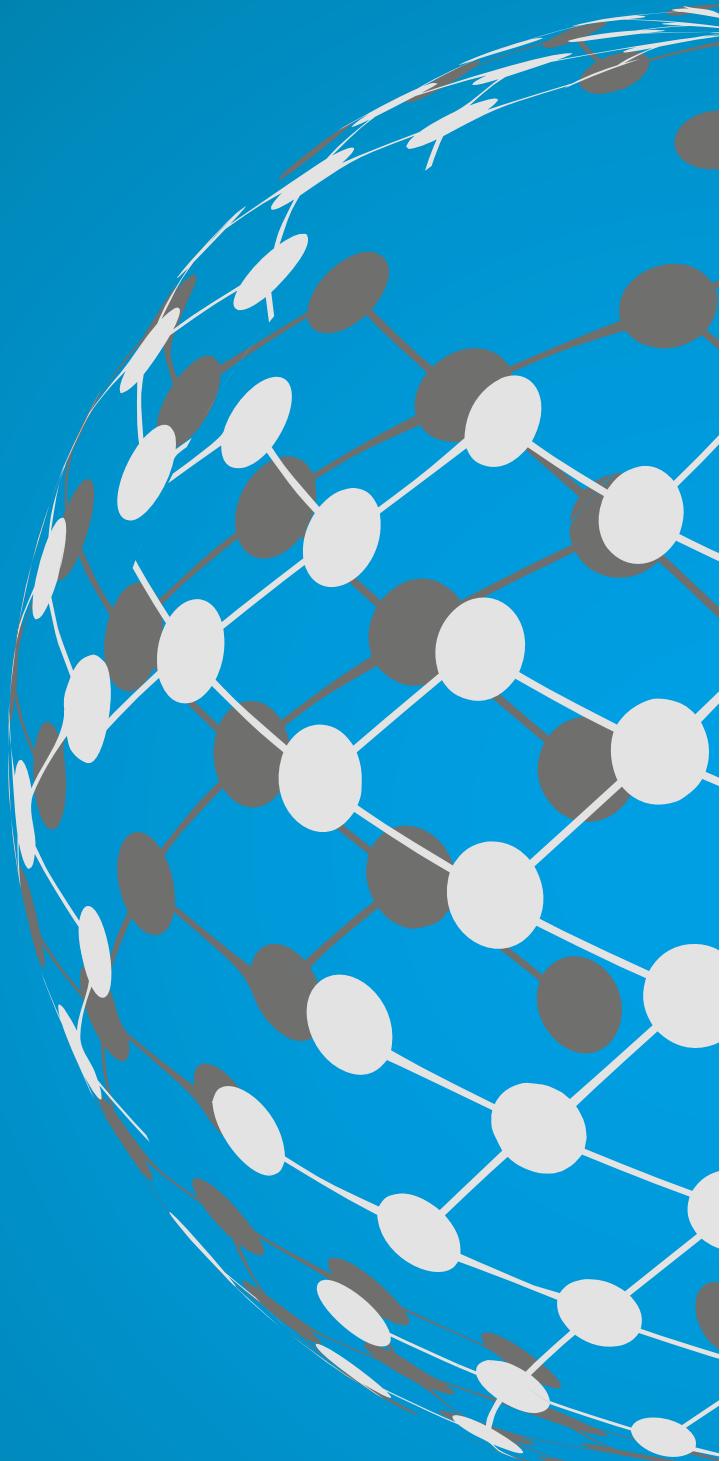
# GLOBAL VALUE CHAIN ANALYSIS: A PRIMER

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*Gary Gereffi*  
&  
*Karina Fernandez-Stark*

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July 2016



Duke

CENTER on GLOBALIZATION,  
GOVERNANCE & COMPETITIVENESS  
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