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**Upgrading in Global Value Chains: Addressing
the Skills Challenge in Developing Countries**

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This paper is based on the [Skills for Upgrading: Workforce Development and Global Value Chains in Developing Countries](#) research project undertaken between 2009 and 2011 by the Duke University Center on Globalization, Governance & Competitiveness to improve our understanding of how workforce development strategies can enhance the upgrading efforts and competitiveness of developing countries in global industries.

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Acronyms

BPO	Business Process Outsourcing
CMT	Cut Make Trim
DFID	Department for International Development
EU	European Union
GDP	Gross Domestic Product
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation)
GVC	Global Value Chain
ITO	Information Technology Outsourcing
OBM	Own Brand Manufacturing
ODM	Own Design Manufacturing
OEM	Own Equipment Manufacturing
NGO	Non-governmental organization
NSDC	National Skill Development Corporation
PGMA	President Gloria Macapagal-Arroyo
SME	Small- and medium-sized firms
TVET	Technical and vocational education and training
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development

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I. Introduction

As developing countries expand their participation in the global economy, human capital is becoming a critical factor for competitiveness. Skills and workforce development are essential elements for upgrading in global value chains (GVC), which are characterized by their dynamic nature that demands individuals who can continuously update and improve their skills in a rapid and effective manner. These globally dispersed chains present multiple opportunities for developing countries to drive economic growth and add value to their industries. However, countries must align their skills development to meet international labor demands to sustain and upgrade their positions within GVCs.

This paper is based on the *Skills for Upgrading: Workforce Development and Global Value Chains in Developing Countries* research project undertaken between 2009 and 2011 by the Duke University Center on Globalization, Governance & Competitiveness.¹ Over the course of this research, we examined the role of workforce development using the GVC methodology in four industries: apparel, fruit and vegetables, offshore services and tourism in 19 developing countries. We analyzed workforce development initiatives implemented by a variety of stakeholders and assessed how these aligned with industry upgrading. We found that these initiatives facilitated upgrading, but also that the formal local educational institutions in emerging nations typically were not well aligned with the skills required by GVCs and they are not adequately positioned to prepare the workforce to adapt to future challenges.

In developing countries, traditional workforce development systems often do not provide the skills required by global industries, and thus greater coherence is required between the skills imparted by education and training and the capabilities required by the private sector (Fernandez-Stark et al., 2010b; Gereffi et al., 2011; Wadhwa et al., 2008). Nevertheless, despite this mismatch, developing countries are adding value to their sectors. We observed that industries are seeking alternatives to overcome the shortcomings of the education system. Complex local arrangements have emerged to support skills upgrading, encompassing a broad range of stakeholders both within and beyond GVCs. These stakeholders include private firms, public and private institutions in education, governments, non-governmental organizations (NGOs), industry associations and international donors. Yet, these local arrangements are reactive policies to fill the skills gaps, and efforts to proactively improve the effectiveness of skills upgrading at the national level are not widespread.

We present a typology for policy recommendations to enhance the capabilities of the labor force to support GVC upgrading. This typology divides policies into three core groups: Early reactive interventions, ongoing proactive interventions and future-oriented interventions. *Early reactive interventions* help to respond to immediate needs of industry and to secure current participation in the chain. *Ongoing proactive interventions* are designed to foster and support upgrading within the chain, by helping to develop a qualified workforce for the emerging needs of the industry. Finally, *future-oriented interventions* are designed to create a solid foundation for the labor force to respond to new demands that are likely in the future. These interventions are complementary and should not be considered mutually exclusive. Future-oriented interventions can be leveraged by different industries through sector-specific training as countries enter, upgrade or exit different value chains. In doing so, over time, the labor force is better equipped for the dynamic

¹ Please see <http://www.cggc.duke.edu/gvc/workforce-development/index.php> for further information regarding this project.

environment of GVCs, and workers are able to learn new skills and adapt to new technologies according to evolving market needs.

This paper has three sections. In section II, we present the GVC and workforce development concepts and explain their relationship to industry upgrading. Section III illustrates how developing countries overcome gaps in formal education by creating a range of workforce development initiatives for GVC upgrading. In section IV, we provide a typology for skills development and present specific policy recommendations for countries and firms to foster workforce development for industry upgrading.

II. Workforce Development and Industry Upgrading

A. Concepts and Definitions

Globalization has created new opportunities for developing countries to participate in the global economy. At the same time, intense international competition threatens to push many firms out of GVCs. Developing countries can no longer compete on cheap labor alone, they must increase their capabilities or specialize in particular market segments. Consequently, there is growing interest in the role of human capital in driving competitiveness in global sectors. However, increasing capabilities in the labor force is a challenging task (Lall, 2001). Developing countries, unable to provide adequate formal training, struggle with high attrition rates and a mismatch of skills taught by educational institutions and the needs of the labor market (Gereffi et al., 2011). Participation in the global economy heightens the sense of urgency with which developing countries must address these shortcomings in their workforce development systems or else lose the opportunity to integrate effectively and gainfully. In this section, we clarify workforce development as a concept and highlight several of the challenges that developing countries currently face in meeting the demands placed on them by global competition.

We define **workforce development** as the process by which a territory's initial endowment of human capital is converted into a source of competitive advantage for firms and industries in the territory (Gereffi et al., 2011, p. 244). In practice, workforce development occurs via multiple channels (formal education, training, and access to relevant services such as labor market information), and it covers a broad range of activities. Ideally, early education (primary and secondary) should provide the foundation of basic skills essential to fast and effective continued learning. This should then be complemented by specific vocational, technical, and professional education directly linked to existing skill requirements and those for the near future. Education and training should cover important "soft" skills such as communication, leadership, teamwork and conflict management. This broad approach to workforce development is essential to create individuals who can continually update their skills to respond to the dynamic demands of the globalized economy.

In this paper, we adopt a GVC approach to improve the match between the skills provided in developing countries and those required by industry. The **GVC framework** has been developed over the past decade by a diverse interdisciplinary and international group of researchers who have tracked the global spread of industries and studied the implications for corporations, countries and workers. This sector-specific approach allows one to understand how industries are organized by examining the structure and dynamics of different actors involved. The value chain describes the full range of activities that firms and workers around the globe perform to bring a

product from conception to production and end use. It examines the labor inputs, technologies, standards, regulations, products, processes, and markets in specific industries and international locations, thus providing a holistic view of industries both from the top down and the bottom up. By breaking down the industry into its key segments, it helps countries to identify the specific activities in the chain that their firms currently perform, as well as potential opportunities for these firms in the future (Gereffi & Fernandez-Stark, 2011).

Insertion and sustained participation in GVCs is paramount for the economic growth of many countries, particularly low-income nations, due to accompanying job creation potential, inflow of foreign currency and contributions to poverty reduction. While the GVC framework is occasionally criticized for its specific focus on global industries, indeed, the same methodology can increasingly be applied to understand how local and regional sectors operate as well (Fernandez-Stark & Gereffi, 2012). As developing countries open their borders to foreign investment, local firms must compete with a growing number of foreign firms for the local market and thus are forced to improve the efficiency and quality of their supply chains. Thus, domestic supply chains are influenced by the international standards of global chains.²

Due to the versatility of the GVC approach and its policy relevance, the value chain methodology has been adopted by major development agencies around the world, including the Department for International Development (DFID-United Kingdom), the German Agency for International Cooperation (GIZ), the United States Agency for International Development (USAID), and the United Nations Industrial Development Organization (UNIDO). Their objective is to devise interventions to improve the role of developing countries in these chains, add value to their production and to allow them to fully capture the gains of their participation (Barrientos et al., 2011; GIZ, 2012; Humphrey & Navas-Alemán, 2010; UNIDO, 2009; USAID, 2012).

In the GVC literature, adding value to production or shifting to higher value activities in global production operations is referred to as **economic upgrading** (Gereffi et al., 2005). Economic upgrading includes six distinct changes in the firm's participation in a production model: *Entry into the value chain*, when a new actor begins to participate in the value chain; *product upgrading*, which describes the shift into the production of a higher value product; *process upgrading* describes improvements in efficiency in the production systems, such as the incorporation of more sophisticated technology; *functional upgrading* describes the movement to higher value stages in the chain that require additional skills; *chain upgrading*, which describes the entry into a new value chain by leveraging the knowledge and skills acquired in the current chain; and finally, *end market upgrading*, which describes the incursion into new higher value end market segments, which may involve geographic or industry shifts, such as textile suppliers moving from apparel manufacturers to customers in the medical, defense or construction industries (Gereffi, 2005; Fernandez-Stark, et al., 2011; Humphrey & Schmitz, 2002).

Upgrading trajectories can be analyzed at both the firm and the country levels. In general, a country upgrades when a critical mass of firms located within its borders achieves upgrading. Upgrading patterns differ based on the input-output structure of the value chain and the institutional context of each country or region in which the chain is embedded. Linear upgrading trajectories are frequently observed in product-based sectors, such as agriculture, as expertise must be developed in one segment of the value chain before upgrading into the next segment; "leapfrogging" is not common. In service industries, on the other hand, numerous distinct upgrading

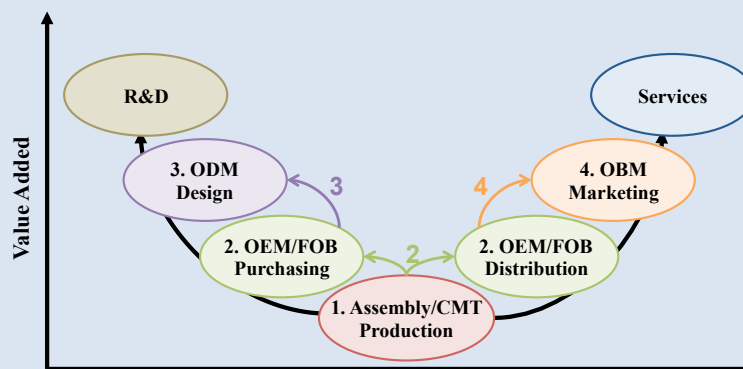
² In Kenya, for example, local supermarket chains helped establish KenyaGAP, a set of standards based on the European norm, GlobalGAP, as well as a Code of Conduct for fresh fruit and vegetable suppliers (Fresh Produce Exporters Association of Kenya, 2010).

trajectories can occur simultaneously. In addition, due to factors such as capital intensity and limited access to technology, firms may also opt to become strong contributors to lower stages of the value chain, in effect “downgrading”, rather than attempt to upgrade into complex functions within the chain. Countries often pursue functional upgrading as the most direct way of increasing the value of their participation in these chains (see example of upgrading in the apparel global value chain in Box 1). However, in developing countries, product and process upgrading are often more easily attainable, since they may require relatively minor adjustments in production and skills development with lower overall investment.

Box 1. Functional Upgrading in the Global Apparel Value Chain

This box describes the stages of functional upgrading may occur in the firms in developing countries in global apparel sector.

Figure 1. Stages of Functional Upgrading in the Apparel GVC



1. Firms in developing countries enter the value chain into the Assembly or Cut Make Trim (CMT) production segment;
2. By developing the necessary competencies in sourcing and direct distribution to retail outlets, firms and countries are able to upgrade to become full package or Original Equipment Manufacturer (OEM) suppliers.
3. By performing design functions, the full package supplier upgrades into stage 3. These suppliers carry out all steps involved in the production of a finished garment, including design, fabric purchasing, cutting, sewing, trimming, packaging, and distribution.
4. By incorporating branding of products, in addition to or in lieu of design and manufacturing, firms enter the Original Brand Manufacturer (OBM) stage of the value chain. In developing countries, firms typically enter this stage with brand development for products sold on their domestic or neighboring country markets.

Source: Frederick, 2010.

Powerful **lead firms** typically govern entry and upgrading along value chains. The behavior of these firms determines how resources and knowledge are generated and distributed through the chain (Gereffi, 1994; Humphrey & Schmitz, 2002a). Through customized and complex exchanges with chain actors, lead firms leverage competent suppliers for additional services and product differentiation (Kaplinsky & Morris, 2001). The large flow of information regarding production processes between lead firms and local suppliers facilitates development of capabilities and expertise of the latter and is an important driver for upgrading in developing countries (Gereffi, 1999).

In today's GVCs, lead firms shape their supplier behavior and ensure quality by dictating sets of **global standards**. These standards allow for the timely and efficient dissemination of large quantities of codified information regarding both the characteristics of the product and the manner in which it is produced that meet the quality requirements of developed-country markets. Through these measures, lead firms can ensure a consistent supply of products from diverse groups of global providers. As standards compliance is essential for sustained chain participation, their wide spread adoption by lead firms has required developing country industries to undergo both product and process upgrading. However, adopting the necessary protocols often requires important financial, informational and network resources that are beyond the scope of suppliers in emerging markets, and thus can serve as important barriers to GVC participation (Lee et al., 2010). Box 2 highlights the challenges small- and medium-sized firms face in responding to changing market conditions. To meet these standards, many producers must enhance their efficiency and systematically increase productivity (Altenburg & von Drachenfels, 2006).

Box 2. Small and Medium-sized Firms in GVCs

Generally small- and medium-sized firms (SMEs) have more difficulties to participate in regional and global value chains compared to large companies because they face additional constraints that limit their competitiveness. These limitations can be summarized in four major categories: Access to markets, access to training, absence of collaborative horizontal and vertical linkages, and access to finance (Fernandez-Stark et al., Forthcoming). Due to both capital and knowledge constraints, SMEs generally spend less on training than larger firms, and when they do train employees, they are more reliant on the public education and training system. These training programs cater to employees from a broad range of companies and sectors and thus lack the specificity to fully impact a firm's business (Castany, 2008). This lack of industry-specific training can limit the ability of SMEs to meet standards and undergo product and process upgrading.

In order to overcome these constraints, SMEs depend on the support of external actors, such as special policies and programs from national governments or international development agencies, to support their insertion in value chains. One of the best practices replicated in several countries is the Spanish program, PIPE (Plan Iniciación Promoción Exterior) created in 1997. This program, with a budget of € 50,000 per SME, provides basic training on how to sell products or services in international markets. A 2011 evaluation showed that 77% of the PIPE's firms serve the export market, creating new employment and boosting revenues and value added of their products and services (Muro, 2012).

Despite its broad application in understanding how developing countries can participate in global industries, GVC analysis has yet to be used specifically to understand the skills requirements for industry upgrading. Indeed, the process of upgrading has been largely treated as a "black box". Limited research has been carried out with respect to the transfer of knowledge through the chain, and how different actors along the chain transform this information into specific capabilities (Morrison et al., 2008; Ramirez & Rainbird, 2010). We propose a bottom-up approach to link GVCs with human capital and labor markets. First, using the GVC methodology, all segments of the value chain and their corresponding activities can be identified, and by examining the activities a country performs, its position in the value chain can be determined. Second, by analyzing the human capital involved in value chain activities, the skills needed for each segment can be identified. Finally, by overlaying the skills requirements with the varied upgrading

trajectories, GVC analysis can then provide guidance for countries to forecast future workforce needs.³ In this way, the workforce will have the necessary skills to add value to the industry both for an economy's current position in the value chain and for projected future upgrading.

We examined 19 country cases across four industries (apparel, fruits and vegetables, offshore services and tourism) in order to identify the relationship between upgrading and the workforce as well as workforce development initiatives that have been successful in driving that upgrading (see Table 1 and Appendix 1) for a breakdown of the countries studied). Each of these sectors accounted for either a significant portion of total exports or employment, or represented an important percentage of the gross domestic product (GDP) of the countries selected for analysis. The apparel industry, for example, accounted for over 35% of total exports in four of the five countries studied (Bangladesh, Lesotho, Nicaragua, Sri Lanka and Turkey) and was as high as 71% and 69% of exports in Bangladesh and Sri Lanka, respectively, while tourism accounted for over 14% of GDP and more than 11% of total employment in the three countries studied (Costa Rica, Jordan and Vietnam) (Gereffi et al., 2011).⁴

Table 1. Global Value Chains and Countries Selected for Analysis, by Upgrading Stage

Global Value Chain	Upgrading Stage of Countries		
	Low-level	Mid-level	Advanced
Fruit and Vegetables	Jordan, Honduras	Morocco, Kenya	Chile
Apparel	Lesotho, Nicaragua	Bangladesh, Sri Lanka	Turkey
Offshore Services	Philippines, the Dominican Republic, El Salvador and Guatemala	Chile	India
Tourism		Vietnam, Jordan	Costa Rica

Source: Gereffi, et al., (2011).

Table 2 provides an example of the specific skills utilized in the offshore services sector. For each of the different job profiles, we identified the skills level, formal education and training, and experience required. This table provides a select number of job profiles for illustrative purposes. However, for each industry segment an exhaustive analysis of the job profiles required should be carried out. In this way, a comprehensive analysis can provide information on the key job profiles needed to remain competitive, but also shows the job profiles in the next segment of the chain, delivering critical information for proactive skills preparation for industry upgrading. The next segment of the chain thus represents a potential upgrading trajectory and the skills needed in the near future.

³ In a less diversified economy that may target specific sectors, this analysis can be centralized in a government agency. However, as the country's economy diversifies, the responsibility for tracking the evolution of these different value chains could be handled by educational institutions. For example, private sector engagement such as survey feedback, representation in teaching staff, or participation in curriculum design could be required for the accreditation of all new courses.

⁴ See Appendix 1 for further information regarding the importance of these sectors in the selected country studies.

Table 2. Job Profiles in the Offshore Services Global Value Chain

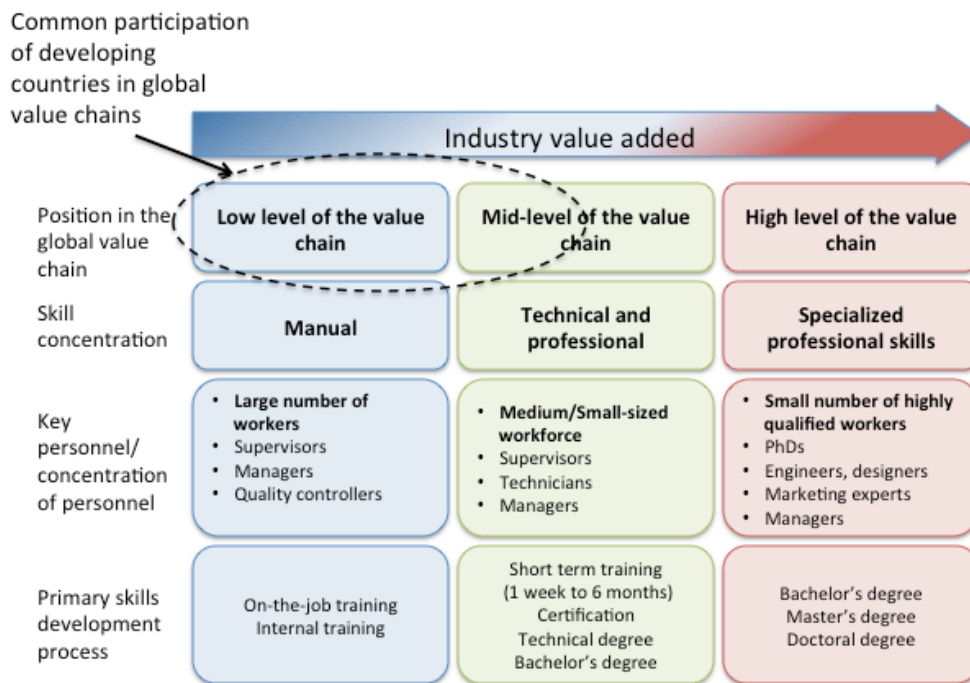
Position	Job Description	Formal Education Requirements	Training/ Experience	Skill Level
ITO				
IT Technician	Maintains equipment and network devices, provides software support for updates.	Technical diploma/degree	Specific technical courses, on-the-job training, and experience	
IT Software Programmer	Programs software applications for general or customized use.	Technical diploma/degree	Software programming courses and certifications	
IT Consultant	Provides advice to help firms align IT strategy with their business objectives (may include information risk management, IT infrastructure, strategy, data management).	Bachelor's degree in IT/ Master's degree in engineering	Consulting/ management experience	
Software R&D Engineer	Designs, develops, and programs innovative software packages and functions.	Bachelor's /Master's/ Doctoral degree in industrial engineering/computer science/informatics	Software programming courses and certifications	
BPO				
Call Center Operator	Answers in-bound calls regarding specific products and provides general customer services.	High school/ Bachelor's degree	Two – three week of training and on-the- job training	
Finance and Accounting Analyst	Provides accounts receivables and accounts payable processing, reconciliations, ledger keeping, and income and cash statement preparations.	High school/ technical institute diploma in accounting	Technical training and on-the-job training	
Marketing and Sales Representative	Supports inbound and outbound sales, sales order processes, and customer monitoring.	Technical/Bachelor's degree	Short training and on-the-job training	
BPO Quality Assurance and Team Managers	Ensure BPO agents meet specified client service standards and monitor agent performance.	Technical and university-level professionals	Technical training and on-the-job training	
KPO				
Business Analyst	Provides business services, such as market research, business opportunity assessment, strategy development, and business optimization.	Bachelor's/Master's degree in business administration	Experience	
Finance Analyst	Provide guidance to businesses and individuals making investment decisions; assess the performance of stocks, bonds, commodities, and other types of investments.	Bachelor's degree in business administration	Chartered Financial Analyst (CFA) certification	
Legal Analyst	Reviews and manages contracts, leases/ licenses. May provide litigation support services or intellectual property services.	Law degree	Experience and training in specific country legal systems	
R&D				
Researcher	Undertakes projects to increase the stock of knowledge; develops new products based on research findings.	Master's/doctoral degree	Experience/industry specialization	

Source: Duke CGGC.

Skill Level	Low	Low-Medium	Medium	Medium-High	High
	No formal education/ experience	Literacy and numeracy skills; experience	Technical education/ certification	Technical education/ undergraduate degree	University degree and higher

Figure 2 below highlights the overarching patterns we identified across the study. First, low-value entry levels of GVCs, such as production or assembly (Column 1, Figure 2), typically rely on a large number of manual laborers. While these workers generally lack formal education and are often characterized as “unskilled,” there is an intense focus “on-the-job training” that contributes significantly to productivity and competitiveness. In this stage, the supervisor role is critical for knowledge transfer. In addition, managers and quality controllers play important roles here as they do throughout the chain. These three job profiles are generally in high demand and low supply and thus are referred to as “bottleneck positions.” Second, the mid-levels of the value chain (Column 2, Figure 2), which typically entail some processing and/or performing new and more sophisticated activities, tend to require a more skilled labor force. Generally, these workers must possess specific technical competencies. Finally, the highest segments of the value chain tend to be knowledge-intensive, requiring specialized skills to perform complex activities and usually the core labor force must possess tertiary education degrees.

Figure 2. Global Value Chains and Skills



Source: Authors.

Both developed and developing countries participate in global industries. Developing countries are typically concentrated in the low-medium value added activities of the chain, while rich economies tend to participate in the higher levels of the chain capturing more value. Given their actual position in the value chain, developing countries demonstrate an imbalance between technical and university level education. Technical education is crucial for industry upgrading for developing countries. Technicians are critical in the middle part of the value chain and without fully dominating those segments, it is difficult to achieve upgrading, particularly in product-based sectors in which “leapfrogging” is not possible. Yet, technical education is the weakest link for many of these nations and serious structural problems have undermined the effectiveness of technical educational institutions. Challenges for these institutions include lack of quality, difficulties

in teaching the skills demanded by the private sector, and a lack of prestige compared to universities where technical education is perceived to have low status and low income potential (de Moura Castro & García, 2003; Song Seng, 2008). At the same time, there is heavy emphasis on university education and there has been a proliferation of new universities in developing nations (Fernandez-Stark et al., 2010a). Latin America, for example, lags far behind the United States and Europe in developing short technical one- and two-year courses, and enrollment rates in universities are much higher than technical education (de Moura Castro & García, 2003).

Due to their relatively low positions in GVCs, many developing countries are not prepared to absorb the large number of university graduates entering the labor market, while they lack important human capital with technical abilities. Surprisingly, the resulting skills mismatch is due not to a skills deficit, but rather a skills surplus, with a corresponding high cost for economies that cannot afford to waste scarce resources. “Over-skilling, or the under-use of skills, in specific jobs in the short to medium term can be a problem because it may lead to skills loss and a waste of the resources that were used to acquire these skills” (OECD, 2012, p. 83). The oversupply of engineering graduates in Colombia at the turn of this last century provides one such example. The proliferation of private universities meant that the country was graduating close to 20,000 engineers annually. However, violence and instability, weak economic growth and limited investment in infrastructure meant that there was weak demand for engineering in the country. As a result, salaries for Colombian engineers dropped significantly, and by 2008, they were the lowest paid engineers in Latin America. Existing firms were forced to seek clients abroad to make up for low local demand, and it was estimated that 25% of graduates from these programs left Colombia to seek work abroad (Fernandez-Stark et al., 2010a).

B. Key Workforce Development Challenges for Upgrading in Global Value Chains

Adequately forecasting future job creation and the corresponding skills requirements is a process that is still unresolved in much of the industrialized world. This challenge of ensuring that the supply of labor meets the demands of industry is heightened in developing economies with high unemployment rates and weak education institutions. Implementation is made increasingly complex by enormous demands on scarce resources, divergent political interests, subpar dissemination of information and regulatory requirements that are misaligned with the needs of the new global economy.

First, governments in developing countries must at once invest significantly in universal basic education and at the same time train their labor force for both current and future positions. Yet this depends on important financial resources and perhaps more importantly, technical expertise, that are often beyond the reach of developing countries. Determining the economy’s future absorptive capacity is a daunting task for these nations, especially for new growth sectors where the country has limited experience (Creticos et al., 2009, p. 11). We argue that if developing countries map the GVCs in which they may potentially compete, identify both their current position and their desired upgrading trajectories, they can focus their scarce resources on developing the labor force they need for the future. However, stakeholders in developing countries often lack an understanding of where they are in the GVC compared to their peers, they have difficulty

reaching consensus of which upgrading trajectory to pursue, and they have unrealistic expectations of what types of upgrading are possible in the short, medium and long terms.

A second challenge is limited collaboration and information sharing amongst stakeholders across the value chain. This makes it difficult to accurately determine human capital stocks, existing institutional capacity and to efficiently disseminate information from the industry to different actors in the education and training arena. In particular, formal communication channels between employers and educational institutions (public and private), such as stakeholder surveys informing schools of workforce trends, engagement of private sector specialists to teach on campus, or the presence of employer representatives on educational advisory councils, amongst others, are weak or nonexistent in many developing countries (Gereffi et al., 2011). This lack of effective communication and information sharing is partly the result of the limited flexibility of educational institutions to respond to the needs of the private sector, as well as a private sector lacking cohesion and unable to articulate its needs in a meaningful way. These information-based shortcomings make it difficult to produce graduates with the skills required for gainful employment in GVCs. Initiatives underway in developed countries, such as engaging employers in developing education strategies to identify skills in high demand and linking educational budgets to these high-demand occupations, have not yet been adopted in policy recommendations for emerging nations. Advisors continue to follow traditional approach of relying on labor market signals to determine training priorities. This reactive model, however, is inadequate for GVC participation, which requires countries to compete aggressively to attract firms and buyers.

A third challenge is that, even where the need for demand-driven training has been communicated to education sector, many developing-country technical and vocational education and training (TVET) systems, institutionally, have been unable to restructure to ensure the provision of actual demand-driven training. Progress has been made with a growing number of institutions including industry advisory boards, soft-skills training and continuous education; however, regulatory frameworks continue to prioritize factors such as curriculum design, teacher qualification and infrastructure standards over graduate employability. The failure to recognize the importance of labor market relevance in technical education undermines developing country participation in GVCs. In these chains, the workforce must be able to adapt to the strict standards set by global lead firms; certification and industry experience or expertise often trump formal teacher education in preparing future employees, yet in many emerging nations industry experts are prevented from teaching in technical training programs due to bureaucratic regulations that require teaching staff to have degrees in pedagogy.

III. Skills for Upgrading: Circumventing Shortcomings in the Workforce Development Systems of Developing Countries

As discussed earlier in this paper, in each of the GVCs studied, the private sector reported a mismatch between the skills provided by the education system and their workforce needs. Efforts to incorporate feedback from the industry into curricula have been largely unsuccessful. This makes it difficult for graduates to develop the skills required for employment in these global industries. Despite these challenges, however, we find that industry upgrading is occurring in developing countries and the labor force appears to be acquiring the necessary skills to support that upgrading. Numerous stakeholders have taken on roles to overcome these shortcomings in the

human capital system of developing countries, including the private sector, international actors, and the government, amongst others.

We examined how this skills acquisition occurs through an exploratory study that focused on specific existing workforce development initiatives, rather than analyzing the education system as a whole. We observed diverse models of workforce development emerging in different stages of the value chain, shaped both by the participating firms and the particular training and institutional frameworks of the host nation. Formal local educational institutions were not well aligned with the skills required by GVCs. These dynamic chains demand “upgradeable” individuals who can learn in a rapid and effective manner, yet local institutions are not adequately prepared to sustain the workforce in this way. This often resulted in a melange of institutions working individually or in partnerships to prepare a workforce that can compete in the global economy. Consequently, certain initiatives were replicated by different actors, while other skill areas were not addressed, resulting in a suboptimal use of resources.

In light of the failure of traditional institutions to support labor market upgrading, our main findings draw from case experiences in each of the four industries studied and they highlight emerging trends for successful workforce development strategies. The selection of these four industries was based on preliminary conversations with multilateral organizations and donors that invest in and support developing countries. The organizations included in these discussions were the World Bank, the Inter-American Development Bank, the International Labor Organization, USAID and Millennium Challenge Corporation. Each of the four industries studied represented a significant proportion of the developing countries’ GDP, total exports, and/or total employment.

The four different GVCs and the diverse characteristics of the developing economies analyzed in this exploratory study (e.g. level of development, population size, geographic locations, natural resource allocations, etc.), offer important initial takeaways in the area of workforce development in GVC upgrading. We have two main sets of findings. First, we present the core workforce skills needed for upgrading in GVCs. We discuss how these needs may differ from preceding industry requirements in developing countries, highlighting the alignment of the education systems with the global labor demand, including strong basic skills, developing soft skills, increasing the supply of managers, and establishing training protocols in line with international standards. Second, we analyze the various stakeholders and institutions involved in meeting these requirements with a strong emphasis on the role of the state.

A. Workforce Skills

An appropriately skilled workforce is fundamental to industry upgrading. While workforce development alone is not a sufficient factor to catalyze upgrading, it is a common requirement that emerges across all sectors for entering and upgrading in GVCs. A skilled workforce is essential for developing new capabilities, adopting new protocols and ensuring the quality standards needed for industry upgrading. This is particularly important for services industries, but also for other sectors.

Workforce development must take into account both local needs and those of the global economy. In the past, the preparation of the labor force was characterized by training designed to fit the needs of local firms. Today’s global economy, however, is dominated by highly influential lead firms that determine which suppliers access high-value markets. Indeed, the standards

regarding protocols, products and processes set by these firms must be met by local producers and international suppliers alike, in order to avoid exclusion from the GVC. In both of the product-based sectors (horticulture and apparel), lead firms dictate industry norms not only with respect to product characteristics and quality, but also production processes. Process standards are also being adopted for service-based sectors. In addition, individual buyers across the sectors have established codes of conduct and they audit their suppliers regularly. These codes include issues such as sexual harassment, labor practices, environmental impact and productivity, and quality assessment. Securing contracts and access to key markets increasingly depends on compliance with these norms. In response, we observed the private sector in developing countries undertaking a wide range of workforce development initiatives according to both global standards and individual corporate codes of conduct.

Participation in GVCs requires a new and evolving set of skills. GVCs are highly dynamic; processes and protocols are regularly updated as technology and knowledge advance and increasingly sophisticated sets of products and services are introduced on a constant basis. Workers within GVCs must keep pace with these shifting conditions. Basic abilities, including literacy and numeracy and “soft skills” such as problem solving, conflict resolution and working well with others are fundamental. Workers must display an aptitude for learning and be committed to lifelong professional development in order to easily absorb new knowledge constantly disseminated through GVCs. These skills are particularly important in high technology sectors, such as electronics and offshore services, where advances in knowledge are being made at a very high rate.

Different industry-specific upgrading trajectories draw on distinct and varied set of skills and training approaches. Process and product upgrading typically leverage the existing labor force through incremental capability enhancements. On the job training, short-term courses and specific certifications are often carried out in-house. Functional upgrading, on the other hand, generally requires a substantially different set of workers with different skill sets, and is dependent on the supply of appropriate workers from the labor market and the performance of formal education institutions. Due to the importance of the development of an entirely new set of capabilities for functional upgrading, this is often much more challenging to achieve in the short to medium term.

Developing interpersonal skills must be prioritized for GVC upgrading. Poor communications skills and inability to work in teams can significantly impede the employee productivity and their ability to upgrade their skills. Employers in GVCs are placing a premium on hiring workers with strong, non-technical skills such as leadership, teamwork, conflict management and effective communications. These workers are better prepared to learn new tasks, absorb and process new information, and respond to increasing demands of GVCs. Our study highlighted that all industries required improvements in workers’ interpersonal skills and their ability to adapt to the changing conditions of the global economy. In the services sector, for example, firms have begun to prioritize these skills over technical education and hire from a broad range of university programs.

In developing countries, the supply of management talent for GVCs is scarce. Management at all levels of the organization affects firms competitiveness; in many industries, they play a key role in providing on-the job training which has become an increasingly employed training technique. Effective management practices can thus have a significant impact on productivity. Training of managers can affect how they perceive the needs of other employees, how organizational capacity is developed, and the way in which human resources management initiatives are integrated with business strategy. All of these factors affect the performance of the firm.

Performance suffers and firms have difficulty complying with global requirements when they lack good managers. However, there is an important shortage of management talent in developing countries. A relatively common practice to overcome the shortage of managerial skills is to hire foreign managers to fill the positions, particularly in the apparel and offshore services sectors (Gereffi et al., 2011). However, when these managers do not speak the local language, they are incapable of communicating and training workers. For example, in Lesotho, the majority of Taiwanese factories, which accounted for 52% of apparel firms in the country in 2011, continued to follow the practice of importing all supervisory and management staff from Sri Lanka, Taiwan and mainland China; amongst management, the common language is Chinese (Morris et al., 2011).

GVC upgrading requires training small numbers of workers for bottleneck positions. Every stage of the value chain depends on both a critical mass of workers, as well as a small number of more highly specialized professionals and technicians. For example, quality assurance professionals in the fruit and vegetable industry are required to ensure food safety requirements are met, and no product can be exported without approval. These professionals and technicians are often in short supply in developing countries, creating bottlenecks for future activities. At the same time, their preparation requires important financial investments in faculty and curriculum development for a comparatively small number of professionals; yet, the commitment of scarce resources to these niche areas is often beyond the capacity of training institutions in developing countries. The use of study abroad programs and foreign consultants were identified as best practices for meeting short term demand for professionals in these areas.

B. Private Stakeholders and International Institutions

Traditional education and training institutions, such as TVET systems, have been largely replaced or are now heavily assisted in filling skills gaps for GVCs, and the private sector is playing a growing role in labor force preparation. While this indeed provides the industry with skilled personnel for upgrading, when firms must take on the financial burden of additional training, it increases the comparative cost of labor in these developing countries and can affect their competitiveness. In addition to private firms, other new actors contributing to skills development include industry associations, multilateral organizations and NGOs. Below we discuss the role each of these actors is playing in developing skills for upgrading.

1. Private Firms

In all four of the industries studied, individual private firms are providing education and training for their workforce that goes beyond the expected on-the-job training in firm-specific procedures, to cover a wide range of basic education needs. In numerous cases, firms have engaged directly with existing educational institutions to provide new courses for the curriculum, faculty to teach the courses, and internship programs to ensure that students have practical experience by the time they graduate and enter the workforce. However, educational institutions, and public ones in particular, can be slow to change and they are often located in big cities, leaving behind students from small cities where businesses are also located. In response to these limitations, firms such as the leading Indian services providers Infosys and Wipro, dissatisfied with the existing tertiary education systems, have created their own in-house universities to teach students the specific skills required to cater to their clients' needs (Wadhwa et al., 2008). These universities also offer a broad range of undergraduate and graduate degrees and leverage e-learning platforms to deliver content directly to their employees' locations. Overall, we find that demand-driven interaction of industry with educational institutions helps the latter to be more successful in teaching

the skills demanded by the labor market. By ensuring a skills match, this increased collaboration becomes an efficient and effective instrument to achieve economic upgrading in global industries.

2. Industry Associations

Industry associations represent a broad range of firms playing both direct and supportive roles in GVCs, and thus can provide more comprehensive information for developing a well-rounded workforce than individual firms working alone. In our study, we found these associations to be extensively involved in driving workforce development for upgrading. Initiatives carried out by these associations across the four sectors include identifying industry job profiles and their required competencies, creating internal training programs, and partnering with educational institutions to customize training and modify existing curricula for current and potential workers. Where training resources were not available locally, these associations established alliances with foreign universities to accelerate the skills development process. This approach was observed for management training skills in particular, through short certification programs to improve the performance of supervisors and managers in GVCs. For example, in 2010, the Jordan Inbound Tour Operator Association developed and extended programs with George Washington University (GWU) to offer a two-week professional Destination Management Certification Program to increase the professionalism within the tourism industry (USAID, GWU, et al., 2010), while in the Philippines, the industry association for offshore services worked with Harvard Business Publishing to establish a management course, combining online and classroom activities to improve the performance of supervisors and managers in the value chain.

3. NGOs and International Agencies

While the role of NGOs and international agencies has been more limited, they have intervened to fill the gaps not covered by other stakeholders and they have helped to facilitate important process and product upgrading. They have played an important role in supporting SME insertion into the value chain, particularly in the provision of training in the fruit and vegetable sector where the incorporation of small producers was a key factor for rural development (Fernandez-Stark et al., Forthcoming). In the least developed countries studied, such as Kenya, Honduras and Lesotho, these organizations have been an important, although not always effective, actor in the absence of active industry associations or government involvement. They have taken on a range of roles from carrying out specific training for standards compliance and working directly with universities to facilitating coordination amongst stakeholders to ensure different actors within the chain have the required skills to enable sustained participation and upgrading. While the contributions from these organizations have been important, they too have been less successful in facilitating skills formation when their interventions have not been carried out in close coordination with the private sector and aligned with national and/or international standards.

C. The Role of the State

While various actors have played a vital role in facilitating workforce development to support GVC upgrading, this should not be construed to say that the government is no longer relevant in industry upgrading. Indeed, the government can be a very important catalyst for industry upgrading by providing three key functions: Facilitation, financial support and regulatory action. We discuss the contribution of the government in these roles below.

1. Facilitation Role

Our research suggests that governments have been more effective in driving industry growth and upgrading through workforce development in the capacity of facilitator, rather than through direct provision of training initiatives. There are two key aspects of successful state facilitation in our cases: Coordination and information sharing.

Coordination role: Workforce development best practices are the result of a sound organization among all of the relevant stakeholders. In particular, public-private partnerships between the private sector, industry associations, educational institutions and government have emerged as an efficient and effective method for workforce development. For example, the Chilean Committee of Ministries for Innovation established public-private councils for strategic economic sectors in 2007. These councils, such as those that developed for the offshore services cluster, included representation from industry associations, leading firms, educational institutions, several ministries and CORFO, the country's economic development agency. This coalition was directed by CORFO and financed by the Chilean Innovation and Competitiveness Fund that provided US\$23 million for 2008-2009. Core issues discussed within this cluster were workforce development, international promotion, regulatory frameworks, and local industry development (Gereffi et al., 2011). These partnerships allow each stakeholder to contribute its best resources to create successful workforce development practices to support GVC upgrading. This is particularly important when upgrading requires high-level technical and analytical skills that are developed over time and presuppose a rigorous technical or university education. However, bringing together multiple stakeholders with many and often divergent interests requires coordination, and the state emerges as a natural entity to invite actors to work together.

Information sharing role: In a limited number of cases, the government was seen to play an important role in facilitating access to important labor market information that helped to drive upgrading by matching demand and supply for different job profiles. This includes publishing timely information regarding key job profiles required for industry sectors, the qualifications required for those job profiles, and salary information for high and low demand positions. Collecting this information, and effectively disseminating it amongst decision makers can help both prospective students and the existing workforce to make better decisions about their careers and ultimately, improve labor market efficiency.

Box 3 provides an example of the state taking on a coordination role to address skills gaps in 21 different industries.

Box 3. Addressing the Skills Gap in India: National Skill Development Corporation (NSDC)

The National Skill Development Corporation (NSDC) is a not-for-profit organization managed through a public and private partnership between the private sector (51%) and the Government of India (49%). NSDC was created in 2009 as part of a national skill development mission to fulfill the growing need in India for skilled labor across multiple sectors and to narrow the existing gap between the demand and supply of skills. The NSDC focuses on 21 key industries that show current and future skills gaps, including: Textiles and clothing, select informal employment sectors, building and construction, auto and auto components, transportation, logistics, and warehousing and packaging, amongst others.

The organization aims to “skill and “up-skill” 500 million people in India by 2022, mainly by fostering private sector initiatives and providing funding in skill development. The key features of NSDC are:

- Upgrade skills to international standards through significant industry involvement and develop necessary frameworks for standards, curriculum and quality assurance
- Enhance, support and coordinate private sector initiatives for skill development through appropriate Public-Private Partnership (PPP) models; strive for significant operational and financial involvement from the private sector
- Focus on underprivileged segments of society and backward regions of the country, thereby enabling a move out of poverty; similarly, focus on the informal sector workforce
- Play the role of a "market-maker" by providing financing, particularly in sectors where market mechanisms are ineffective or missing
- Prioritize initiatives that can have a multiplier or catalytic effect as opposed to one-off impact.

Source: National Skill Development Corporation, 2012.

2. Financial Role

The promise of important employment creation, potential spillover effects and heightened competition from other countries have encouraged governments to directly finance education and training for entry and upgrading in several global industries. This is an investment with important returns and thus is not identified as a cost. The demonstration effect provided by government spending for both the individual in terms of career opportunities and the private sector in improved productivity has been important to incentivize local labor and firms to invest in their own skills development. This financing has helped to create more productive workers, generating more value added to domestic industries, and also attracting foreign direct investment that will contribute to ongoing economic development. State-funded scholarships and tax incentives for training have emerged as two of the most prominent tools used. These scholarships have been used for specific short-term training, such as widespread English-language programs, and funding for young professionals to seek further education abroad both in tertiary education programs and internship opportunities in key industries. Box 4 below highlights the training programs funded by the Philippines government. This government has been highly proactive in workforce development in the offshore services value chain, in an effort to reduce under- and unemployment and leverage opportunities to increase incomes through upgrading.

Box 4. Philippines Government Financial Support for the Offshore Services Industry

The Filipino government has created special programs to encourage workforce development in the offshore services industry. This industry is considered a strategic sector to drive both exports and employment. The **PGMA Training for Work scholarship**, created by the government in 2008, has awarded 40,000 scholarships for workers in the offshore services value chain, specifically in the ITO and BPO segments. The program invited “recent high school graduates, employees looking for a career change, underemployed or unemployed” to apply. More than 30,000 people have already completed their training, and 67% of graduates are working in the sector (BPAP, 2009). Due to the success of the program, the president of the country extended the program in 2009 to train near hires*. Job placement was even higher for these graduates, with 75% finding work in the industry. Additionally, the government created a new project to train underemployed medical professionals to provide medical transcription services to offshore companies.

Furthermore, to reduce the information asymmetry in the industry labor market, the government provided financial support for the creation of the private sector’s National Competency Test Initiative with the goal to provide a database with skilled candidates for the industry.

*“Near hires” are potential employees for the sector that are rejected in the recruitment process due to specific shortcomings in their skills. Program training focuses on developing near hires weaknesses in order to usher them into the workforce as quickly as possible (Oliva, 2008).

3. Regulatory Role

When countries enter GVCs and there is a demand for skills improvements, this can result in an explosion in the number of institutions offering training for the sector, many of which may not be at an acceptable level. The government can play an important role in ensuring the quality of training through accreditation of universities and technical institutions without limiting the necessary flexibility to modify the curricula in response to labor demands. The creation and oversight of national certification programs can be a powerful tool for the development of appropriately qualified GVC labor markets in developing countries. Competency certifications reduce transaction costs related to recruitment and selection, and the level and portability of skills can be increased for certified workers facilitating labor mobility (Gereffi et al., 2011). This helps foster the establishment of a competitive labor market, based on skill level rather than contacts or perceptions of skills. We observe successful outcomes for worker skill certifications where the government worked together with industry associations and educational institutions. Success is particularly notable where skills are aligned with international standards requirements.

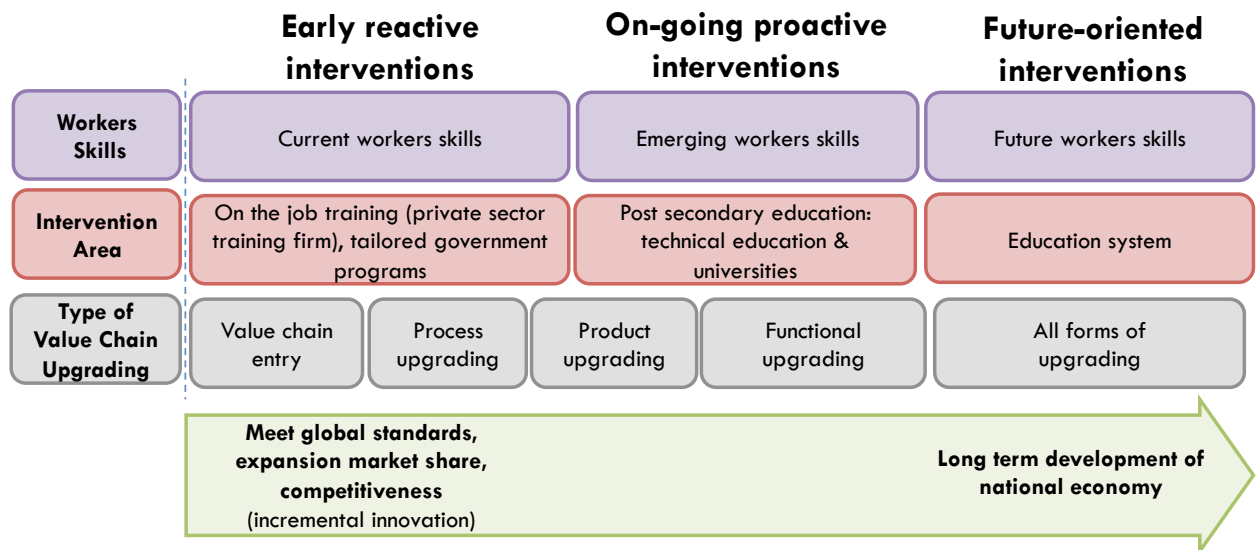
IV. Skill Development Policy Recommendations: A Typology

Under current conditions, developing countries face considerable difficulties in cultivating the skills for GVC upgrading. Education systems are not creating individuals well suited to the continual learning and soft skills required in dynamic global industries, technical education remains weak and unable to provide the correct skills for industry upgrading, and scarce resources are being channeled to inappropriate areas. For these reasons, we see a plethora of other institutions providing patchwork solutions to cover gaps in basic education and training. In this section, we

present a typology for skills development policy based on the actual situation that developing countries face. Three categories are identified: Early reactive interventions, ongoing proactive interventions, and future-oriented interventions. These categories are described below.

Figure 3 illustrates the typology of skills development policies for GVC upgrading, paying attention to the kind of skills needed for today, tomorrow and the future, intervention areas, type of value chain upgrading, and impact in the national economy. For each of these policy areas, we offer recommendations for skills development for GVC upgrading, as well as workforce initiatives that support the growth of the economy as a whole. At the end of this section, Table 2 provides examples of skills development policies from selected industries.

Figure 3. Typology of Skills Development Policies for Global Value Chain Upgrading



Source: Authors.

Early Reactive Interventions include actions to alleviate the immediate challenges of skills gaps. The main purpose of these interventions is to align *existing* workers skills with the demand of GVCs. This requires an industry analysis to assess the position of the country in the GVC in question, and identify the critical skills to meet international standards, expand market share and sustain competitiveness. Early reactive interventions appear to be more effective when the private sector utilizing the skills is directly involved in the training process, and the government acts principally as a facilitator and provides financial support and regulation. Widely adopted interventions that have been successful include tax break incentives for training and special courses financed by the government to upgrade the workers skills in a particular area.

Policy Recommendations: These policies are specifically aimed at improving workers' productivity to drive industry competitiveness and meet international standards requirements in the short term.

- a) Evaluate the skills gap within industries, identifying areas that need rapid remediation. This will require quick sectoral studies that detect the major skills deficiencies for industry competitiveness.

- b) Encourage private sector organization to coordinate and strategize about the industry skill gaps and invest in training for their workers. This will ensure that workers acquire the correct skills on site while simultaneously receiving practical on-the-job training.
- c) Prioritize targeted training in the areas of major skills gaps. For example, several countries have identified language skills as an important gap to participate in the offshore services industry; in response, several governments have awarded scholarships to workers in that industry to study English.
- d) Focus on improving managers' skills, since they play an important role in providing and raising workers skills. Good managers are essential for knowledge dissemination and spreading good practices among workers. They also act as key agents in promoting soft skills that are in short supply and high demand in developing countries.
- e) Particular attention should be paid to near-hires – that is, job-seekers who are not employed because they lack specific skills required by the labor market. Special training can move near-hire individuals to ready-hire workers.

Ongoing Proactive Interventions are aimed at preparing emerging workers' skills related to GVC upgrading for the near future. The objective of these interventions is to proactively prepare the labor force for functional upgrading into the next stage of the value chain. This requires an industry analysis to evaluate the possible upgrading paths as well as an identification of the critical job profiles in the next levels of the chain. These proactive interventions will sustain growth, enhance competitiveness and promote innovation. In developing countries, the skills of workers for the near future are typically located in the middle segments of the value chain and demand technical capabilities. Emphasis should be placed on establishing excellent technical education institutions able to deliver relevant skills for GVCs and local public and private councils in which government, private sector and educational institutions collaborate. Leveraging scholarships and internships abroad, partnerships with foreign educational institutions and the expertise of foreign consultants can help to accelerate the accumulation of knowledge and skills for these positions.

Policy Recommendations: These interventions should focus on skills needed in the near future, meaning the skills that are not in high demand today but will be needed once the industry starts adding more value.

- a) Assess the position of the country in a GVC. Understand where in the chain the country is concentrated, and strategically determine potential upgrading paths. The new GVC segments may require workers with new skills. Identify core job profiles for desired upgrading trajectories, including bottleneck positions.
- b) Foster collaboration amongst key stakeholders by creating public and private strategic councils in key national industries to decide the sector upgrading strategy and a corresponding skill development plan. The strategic council should have a special working group devoted to workforce development, which analyzes, informs and directs strategies to supply workers with the skills needed in the market.
- c) Prioritize technical education in the national education agenda. Technicians are critical to support industry upgrading in developing countries.
- d) Create incentives to link training institutions and the private sector. The probability of upgrading is low in the absence of dialogue and cooperation between these two actors. A collaborative approach is mandatory to add value to national industries.
- e) Provide study-abroad scholarships in key economic areas of the countries. Scholarships should be aligned with bottleneck positions and the near term skills demand. Ensure these

scholarships are awarded on the condition that students return home following the completion of their studies. These scholarships can include short certifications, diplomas, or tertiary education. Additionally, encourage the hiring of foreign consultants to run train-the-trainer programs in subjects with near future demand and bottleneck positions. Support alliances between local universities and foreign institutions to develop curriculum. Leverage e-learning opportunities.

- f) Provide incentives to the private sector for internal worker skills upgrading, including mentoring and career planning for workers. This will support adding value to national industries by leveraging the experience of existing workers for the future.
- g) Create national information systems that disseminate information about needed skills, salaries, key skills gaps or other relevant information regarding workforce development.
- h) Provide incentives such as scholarships or easy access to financing to encourage students to select areas of education with high labor demand and future prospects. This will also help to regulate the labor market saturation in certain areas and increase the labor pool in high demand areas.

Future-Oriented Interventions are designed to develop worker skills to advance in GVCs in the long term. The main purpose of these interventions is to create “upgradeable” individuals that have solid basic skills and can successfully be inserted into dynamic global sectors. These future-oriented interventions will drive national economic development supported by a labor force with strong capabilities. These interventions require improvements in skills for workers from early ages, including primary and secondary education, technical education and advanced education. Intervention elements include solid literacy and numeracy programs, tools for the world of work, high quality technical and tertiary education, and soft skills training. Soft skills include work ethic, communication skills, fostering the desire to learn, teamwork, problem solving and adaptability at all education levels.

Policy Recommendations: These interventions aim to improve the national education systems to prepare individuals able to learn and adapt to new labor requirements in GVCs.

- a) Strengthen basic skills in primary and secondary education. Ensure that children master basic skills that are critical for lifelong learning, which is required for participation in GVCs.
- b) Particular attention should be given to “soft skills” throughout the different education levels. Include these core skills as part of the curricula and stress the importance of them for work in the global economy. These skills are essential because they provide a solid platform to become a highly productive worker.
- c) Prioritize and reformulate technical education. Technical education should be in line with the needs of the labor markets and coordination with the private sector is key to provide solid and relevant technical capabilities. Produce more and better technicians to support upgrading in middle levels of the GVCs. Facilitate continuous, life-long learning programs for technicians.
- d) Establish efficient and effective mechanisms that ensure a long and strong partnership between the government, private sector and educational institutions.

Box 5 illustrates how Costa Rica is implementing policies in each of the three intervention areas proposed in order to compete effectively and upgrade in the offshore services GVC.

Box 5. Costa Rica's Offshore Services Talent Pipeline Development

In Costa Rica, growing competition for the country's human capital in the offshore services sector has led to all three interventions occurring simultaneously. Firms in the sector recruit high school students to enter into basic "technical" agent positions. Firms see this approach as a pipeline for generating human capital for upgrading into higher segments of the value chains. First, the firms provide immediate internal training for these agents to be able to fulfill their entry-level functions (*early reactive interventions*). At the same time, they actively encourage these agents to pursue further education, providing time off to study and in some cases, even providing tuition reimbursement for students pursuing university degrees. Firms have also begun to proactively work with universities in curriculum design, to ensure that their long-term needs are met (*on-going proactive interventions*). As these agents progress in their education, they are provided opportunities within higher value services in the company. At the same time, the Ministry of Public Education has established bilingual public high schools with a technical focus on the call center sector in Costa Rica to meet strong demand for agents with fluency in English in the offshore services industry, thus ensuring an ongoing supply of entry-level graduates for the industry (*on-going proactive interventions*). Finally, in 2008, Costa Rica Multilingue, a not-for-profit organization focused on developing communicative skills that allow for greater personal and professional development, was launched by government decree.¹ Central to the organization's strategy is the National English Plan that aims to graduate all secondary students by 2017 with an intermediate and advance level of English (*future-oriented interventions*).

This multi-stakeholder approach is helping to facilitate both the country's immediate competitiveness and longer-term upgrading in the offshore services GVC, simultaneously providing immediate technical talent for the sector and also ensuring long-term career development for individuals.

¹ This was to ensure the sustainability of the project over time, regardless of the political party in power at the time.

Finally Table 3 highlights examples of each policy group in the four industries studied. In addition, an example of a future-oriented approach is drawn from the Australian education policy. Each of these initiatives was implemented to respond to shortcomings of the existing education and training systems in the countries studied, however, when carried out in conjunction with the initiatives described in each of three policy groups above, these interventions will support GVC upgrading, creating competitive industries with flexible workers able to adapt to international trends.

In conclusion, for the most part developing countries have yet to establish adequate integrated responses to meet the workforce development needs of constantly evolving and competitive GVCs and a patchwork set of initiatives carried out by a range of actors has emerged to fill this gap. A comprehensive approach that effectively combines the efforts of private sector, educational institutions, the government and other interested stakeholders would be more efficient to drive the competitiveness of developing countries in these global industries. The policy typology outlined in this report provide a model for satisfying the immediate demands of these chains, while at the same time, proactively developing a supply of human capital for on-going industry development and long term engagement in global chains in the future.

Table 3. Skills Development Policy Examples from Selected Industries

	Early Reactive Interventions	Ongoing Proactive Interventions	Future-Oriented Interventions
Fruit and Vegetables	In Kenya , multiple aid agencies and foreign governments, working together with local institutions and the private sector, funded training and technical assistance programs for smallholders .Many of these programs occurred between 2000 and 2010 to ensure that important suppliers were not eliminated from the value chain when the GlobalGAP standards were introduced.	In Chile , AGROCAP was established in 1999 as an intermediary between producers, the fruit and vegetables export association, private training institutions, and the state employment and training agency. The organization works to ensure that training meets the industry’s human capital needs, as well as disseminating good workforce development practices to ensure a supply of trained workers for the future.	In 2008, in Australia the Melbourne Declaration by Australia’s Education Ministers noted that in order to ensure the high quality of life in Australia, the country would have to be well positioned to compete in the global economy, with a specific focus on knowledge and innovation.
Apparel	In 2008, the Bangladesh Knitwear Manufacturers and Exporters Association, in partnership with the government and with funding from GIZ, established free training programs in sewing, knitting, and quality management for students completing high school with a focus on young females. In two years, 2,300 students completed the training and were guaranteed employment by the association. The government provided for infrastructure and other expenses.	In Sri Lanka , the government partnered with the apparel industry association, JAAF, and individual firms to develop a comprehensive skills manual, “Competency and Beyond,” incorporating the competencies required for all positions in the apparel GVC. The government allocated financing towards strengthening marketing capabilities, creating design capabilities, improving productivity within firms, and developing technical competence.	To achieve this, the Council of Ministers identified seven essential skills for youth to be successful at work in the 21 st century as confident and involved learners and effective communicators: <ul style="list-style-type: none"> • Literacy • Numeracy • Information and communication technology capabilities • Critical and creative thinking • Personal and social skills (including leadership and teamwork) • Ethics • Intercultural communication.
Offshore Services	In Guatemala , the government offered 2,000 scholarships to study English to the members of the Call Center Commission; to become a member of the Call Center Commission, firms must meet specific service quality standards. The CCC was established in 2010 with government support to attract new talent to the industry, rather than competing for talent and driving up attrition rates	Becas Chile , a government study-abroad program, extended academic scholarships to included technical, masters and doctorate programs as well as internships abroad for the offshore services industry. The principal goal of this program, established in 2008, is to ensure the availability of highly qualified personnel for the industry to upgrade in the future.	Referred to as “general capabilities,” these skills must be developed across the curriculum in both primary and secondary schools across Australia. All teachers, regardless of specific technical subject area, are required to contribute to the development of these skills.
Tourism	In Jordan , in 2010, the national tour operator association developed a pilot internship program with Queen Rania Institute of Tourism and Heritage at Hashemite University, supported by USAID, to help bridge the skills’ gap between graduates of tourism courses in Jordan and the skills required by the industry. Prior to beginning their practical training, students participated in training courses in English for tourism, communication skills, business writing, tourism sector orientation, customer service and time management.	With the support of the Inter-American Development Bank, a regional skills certification for the hospitality and tourism industry was established in the Caribbean in 2002 to standardize the quality of skills development of workers and facilitate labor mobility. Over 2,000 Caribbean tourism industry professionals contributed expertise to the standards and certification development program, which covers 47 critical positions in the industry.	

Source: ACARA, 2012; Gereffi et al., 2011.

V. Appendix

Table A.1. Selected Indicators for Four Global Industries, by Country (2008)

Fresh Fruit & Vegetables						
	Chile	Kenya	Morocco	Jordan	Honduras	
GDP per capita (at PPP; \$US)	13,390	1,432	3,938	5,137	3,633	
Exports - (US\$ bn)	4.0	1.06	1.21	0.47	0.275	
Exports % of total exports	6.1	21.1	6.0	6.1	11.6	
Total labor force (million)	7.1	18.2	11.8	1.9	2.8	
Employment in horticulture	450,000	500,000	400,000	67,000	15,000	
Apparel						
	Turkey	Sri Lanka	Bangladesh	Lesotho	Nicaragua	
GDP per capita (at PPP; \$US)	\$14,068	\$4,571	\$1337	\$1,566	\$2,682	
Exports (US\$ bn)	\$13.6	\$3.5	\$10.9		\$1.0	
Exports % of total exports	10.3%	40.9%	71.1%	69.2%	36.8%	
Total Labor Force (million)	26	8	77	1	2	
Employment in apparel	500,000	270,000	2,800,000	45,310	51,300 ^a	
Offshore Services						
	India	Philippines	Chile	Dominican Republic	El Salvador	Guatemala
GDP per capita (at PPP; \$US)	3,011	3,306	14,579	8,446	6,721	4,749
Exports (US\$ bn)	47 ^e	6	0.86	NA	NA	NA
Exports % of GDP	4%	3.6%	0.05%	NA	NA	NA
Total labor force (million)	475.6	38.8	7.1	4.4	2.8	3.9
Employment in offshoring	2,236,614	475,000 ^b	20,000	22,000	6,800	6,500
Tourism						
	Costa Rica	Jordan	Vietnam			
GDP per capita (at PPP; \$US)	11,250	5,571	2,792			
Exports (US\$ bn)	2.53	3.54	4.99			
Exports % of GDP	14.8%	21.6%	14.5%			
Total labor Force (million)	2	2	46			
Employment in tourism	14.4%	19.8%	11.5%			

Source: Gereffi, et al. (2011).

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