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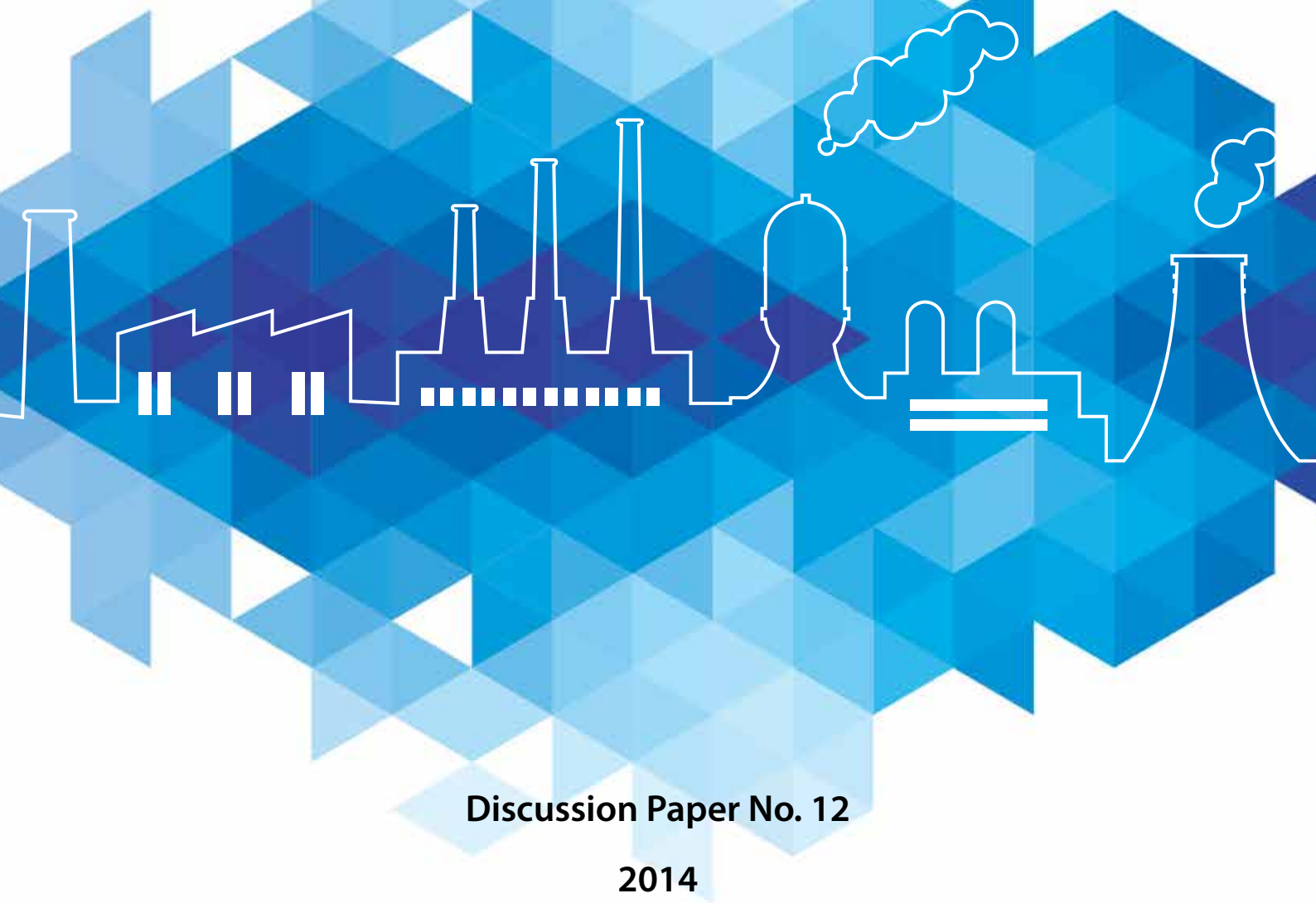
COMPETITIVENESS AND LINKAGES IN CAMBODIA'S MANUFACTURING SECTOR



Discussion Paper No. 12

2014

Competitiveness and Linkages in Cambodia's Manufacturing Sector

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FOREWORD

Cambodia has achieved remarkable development over the past decades. The economy has grown impressively on average at 7.7 percent over the period 1993-2013, making it one of the best performing economies in the world. Robust economic growth has significantly contributed to poverty reduction. Poverty rate declined from around 53 percent in 2004 to less than 20 percent now.

There is, however, a consensus that Cambodia needs to accelerate economic and industrial diversification, shifting from the currently narrow-based growth to a more broad-based growth. This is obvious that Cambodia needs to promote more industrial and higher value-added activities through enhancing labour productivity and attracting more quality foreign direct investments.

Responding to this formidable challenge, the Linking Policy and Practice (LPP) project of the United Nations Development Programme (UNDP) Cambodia undertakes a study on "Competitiveness and Linkages in Cambodia's Manufacturing Sector." The study is conducted to support the industrial development policy of the Royal Government of Cambodia in understanding the current status of the manufacturing sector and promoting the development of new industries in Cambodia.

The study highlights key strengths and weaknesses as well as the linkages and spill-over effects of the manufacturing sector that serve as the critical findings for diversifying the industrial base. The manufacturing sector's competitiveness is constrained by key factors such as a lack of infrastructure support (i.e. energy supply and transportation), a lack of skilled labour and rising labour costs, and rudimentary regulatory framework in terms of transparency of investment incentive schemes.

As such, the study provides a series of policy recommendations including adopting human capital development policy, public-private partnership framework, and fiscal reform in order to support industrial development in Cambodia. Particularly, the study reveals that skills development and training and retooling workforce are vitally important to absorb technology transfers, to move up the production value chain, to create domestic linkages with multinational activities, and to develop new industries.

This discussion paper is expected to contribute to knowledge body and policy debate on industrial development in Cambodia in her efforts to embark upon a new economic path to achieve sustainable, equitable, and inclusive growth.

UNDP Cambodia

ACKNOWLEDGEMENTS

The study is undertaken by UNDP Cambodia in collaboration with the Supreme National Economic Council (SNEC) and the Council for the Development of Cambodia (CDC). The study is an initiative of the UNDP's Linking Policy and Practice (LPP) project and coordinated by Ms. Dinravy Khorn, UNDP Policy and Research Coordinator.

The research is led and written by Dr. Shandre M. Thangavelu, Associate Professor and Regional Director (Southeast Asia) at the Centre for International Economic Studies, Institute for International Trade, University of Adelaide. Mr. Runsinarith Phim, UNDP National Development Economist, has contributed extensively to the study from advising how the analytical framework of the study should be designed to reviewing empirical works and early drafts of the study. Mr. Roger Kuettel, UNDP Economist, and Mr. Kongkea Chhoeun, UNDP Extractive Industry Officer, have assisted with the field surveys and peer reviewing the drafts of the study.

We would like to extend our gratitude to SNEC research team led by His Excellency Ros Seilava, Secretary of State of the Ministry of Economy and Finance; CDC Senior Officials led by His Excellency Sok Chenda Sophea, Minister attached to the Prime Minister and Secretary General of the CDC, for providing valuable guidance and comments and facilitating the field surveys.

The study has greatly benefited from the views, suggestions, and recommendations of relevant stakeholders during the consultation meetings throughout 2014.

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ABBREVIATION AND ACRONYMS

ASEAN	Association of Southeast Asian Nations
CDC	Council for the Development of Cambodia
CET	Continued Education and Training
FDIs	Foreign Direct Investments
GDP	Gross Domestic Products
MNCs	Multinational Corporations
NIS	National Institute of Statistics
PPP	Public Private Partnership
RGC	Royal Government of Cambodia
SEZs	Special Economic Zones
SMEs	Small and Medium-sized Enterprises
SNEC	Supreme National Economic Council
STEM	Science, Technology, Engineering and Mathematics
SWOT	Strengths, Weaknesses, Opportunities and Threats
TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme

EXECUTIVE SUMMARY

1. According to the Supreme National Economic Council (SNEC), the next stage of Cambodia's industrial development strategy focuses on transforming the economic structure of Cambodia, by providing more value-added from a wider economic base that can ensure sustained growth with equity. The objective is to upgrade the economy through promoting the development of the industrial sector, which would lead Cambodia towards a 'new phase of economic base diversification', through the use of its endowments and relying on Cambodia's comparative advantages.

2. In close collaboration with SNEC, the United Nations Development Programme (UNDP) is conducting a Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the Cambodian economy, with a specific focus on the manufacturing sector, to increase its competitiveness in the global production value-chain. This study is part of the discussion between UNDP and SNEC under UNDP's policy support to the Royal Government of Cambodia (RGC).

3. The objective of the study is to support industrial policy in developing key industries that will increase the competitiveness of domestic industries and inclusive growth for the Cambodian economy. This is expected to create more equitable growth, human capital development and inclusive growth to generate welfare improvements for the Cambodian people. The inputs of the study are expected to provide valuable insights to the RGC in developing its long-term vision towards 2030 for sustainable and inclusive growth for the Cambodian economy.

4. The paper will adopt the SWOT framework to analyze the potential of Cambodia's manufacturing sector to increase its global value-chain production and identify its potential in ASEAN integration in 2015. The SWOT will concentrate on identifying key problems and possibilities and creating general directions for reform. It will also cover key industries from four provinces and special economic zones (SEZs) from Battambang, Siem Reap, Svay Rieng and Sihanoukville.

5. The study will use the Input-Output table for Cambodia to study backward and forward linkages for manufacturing industries. The Input-Output table can be used to analyze production at its various stages, in terms of intermediate inputs and final output. The output of the industries in the Input-Output table could be used to identify various forward and backward linkages in the production process. These linkages will identify the strengths and potential of domestic industries in supporting multinational activities, as well as regional production and supply-chain activities. The quantitative Input-Output analysis will complement the qualitative SWOT analysis of the manufacturing sector.

KEY RESULTS OF THE SWOT ANALYSIS ON THE MANUFACTURING SECTOR

1. Low labour cost is cited as one of the key factors for locating in Cambodian SEZs. However, several foreign companies highlighted the rising cost of labour in Cambodia as one of the key concerns for foreign operations in the domestic economy.

2. Tax and import duty exemption is cited as the next important factor, and is one of the key pull-factors for locating in Cambodia.

3. However, tax evasion and "loop-hole" mining by foreign companies, in terms of de-registering and changing the name of the company to get further tax exemptions as a "new" company to prolong and retain their tax incentives and import subsidies was observed. The Government needs to consider a progressive tax and incentive system that allows for upgrading multinational corporations (MNCs) further up the production value-chain. This will be important to retain quality MNCs and quality multinational activities in the Cambodian economy.

4. Several foreign companies, especially Japanese MNCs, see opportunities in the Cambodian economy beyond tax exemption and low labour costs. The ASEAN production value-chain, domestic capacity building (human capital development) and the growth of the domestic manufacturing base are cited as key factors for creating opportunities in Cambodia.

5. Lack of proper infrastructure support (highways) both outside and within SEZs was highlighted as a key challenge for the competitiveness of the manufacturing sector in Cambodia. Firms face difficulties with energy and electricity supply, as their operations are frequently disrupted by electricity and water stoppages.

6. Several multinationals, especially those from Japan and Korea, raised concerns around the regulatory framework in terms of transparency of investment incentives and import duty exemptions provided by the Government. They highlighted that there are few clear rules and regulations for business operations.

7. Japanese and Korean investors are more concerned with creating domestic capacity in terms of training, research and development, and developing domestic industries and links.

8. The Japanese are willing to share costs with the Government and participate in public-private partnership (PPP) programmes. They expect and prefer a greater domestic manufacturing production base to create agglomerative effects in Cambodia. Japanese investors see greater opportunities in Cambodia as the production value-chain shifts down from Thailand and Viet Nam (Thailand + 1 Strategies).

KEY RESULTS OF THE LINKAGES AND SPILL-OVERS ANALYSIS ON THE MANUFACTURING SECTOR

1. The study considered the linkages between domestic firms and multinational activities in the domestic economy. Linkages are created by the supply of material inputs and services provided by domestic firms. These linkages create avenues for technology, management, marketing networks and human resources to be transferred from multinationals to domestic firms. They link the type of activity of the multinationals with domestic absorptive capacity in terms of the activities of the domestic industries, level of human capital, and stable and transparent institutions.

2. We observed positive and statistically significant backward links for the services sector, but we did not notice statistically significant backward linkages for the manufacturing sector. This is likely due to the lack of strong domestic industries to form linkages with multinationals.

3. The horizontal linkage variable is negative and statistically significant. It is also negative and statistically significant for the services sector. We also observed that the forward linkage is negative for the overall manufacturing sector.

4. There is a significant technology gap between foreign and domestic firms, however there are positive impacts in the domestic absorptive capacity from the forward linkages. We observed that higher productive domestic firms tended to enjoy higher horizontal linkages and benefited more from the backward linkages of the multinational activities.

KEY RECOMMENDATIONS

1. The **Human Capital Development Policy** will be crucial to creating and sustaining a competitive edge among industry in the Cambodian economy. Improving human capital is critical to improving the productivity of Cambodian workers in a tight labour market. Developing human capital will help alleviate the skilled labour crunch and increase incentives to move towards capital-intensive production. The SWOT analysis reveals the importance of skills development and training workers to the multinationals. Several multinationals highlight that one of the key weaknesses of the Cambodian economy is in skill development; this will have important implications for adopting new technologies and moving up the production value-chain. Further, empirical analysis reveals the importance of skilled workers absorbing and creating strong domestic linkages to multinational activities. This can be achieved through:

    a. The use of educational reform to improve education at secondary level and to increase training and retooling programmes such as progressive continued education and training (CET) and technical and vocational education and training (TVET) to develop workers' skills.

    b. Align and consolidate existing CETs and TVETs into a progressive framework. The consolidation will reduce overlap and improve the efficiency of domestic and foreign funds and resources for training.

    c. Improve the quality of training by accreditation of CET and TVET programmes through public private partnership (PPP) initiatives. Industrial associations could play an important role in the accreditation of training programmes.

    d. Increase young people's incentive to invest in education. The Government could set up an educational subsidy (conditional cash transfers) directed at households to reduce the opportunity cost of working and to increase returns on investing in education.

    e. STEM – Science, Technology, Engineering and Mathematical skills should be taught from an early age. Curriculum reform, in terms of standardization, should be implemented at the primary school level.

    f. Develop strong labour institutions that increase returns on investing in human capital for both employees and employers. For example, the Tripartite Wage Bargaining system consisting of government, employers and employees (unions) would be a useful framework.

2. **Fiscal reform** to improve the provision of government services to industry and increase competitiveness.

   a. Currently, fiscal incentives (especially tax holidays, tax exemptions and import duty exemptions) have been the key attractions for labour-intensive multinational firms to locate in Cambodia. The Government could consider using this policy instrument to retain existing firms and attract viable multinationals from Thailand and Viet Nam. Given that labour-intensive multinational firms in the garment sector are cost-sensitive, a robust incentive package could potentially delay their inevitable exit from Cambodia to neighbouring Myanmar where wages are comparatively lower.

   b. However, the above simple fiscal tool is not sufficient and sustainable in the current economic climate, without raising government revenue.

   c. To raise revenue, the Government must provide transparent rules and regulations on tax incentives. The Government could consider a progressive tax and incentive system to manage and move multinationals up the production value-chain.

   d. The SWOT study highlights that several multinationals "loop-hole" mine the tax incentive system. The Government needs to improve its enforcement of the tax incentive system and close "loop-hole" mining by the companies. "Loop-hole" mining reduces the effectiveness of tax exemptions in reducing the location cost of foreign companies establishing their initial operations in the economy. It is important that Cambodia attracts quality foreign direct investment (FDI) activities that contribute to the industrial and economic development of the economy. These contributions could be in the form of corporate tax and corporate social responsibility. Foreign firms that are not able to make economic and social contributions are mostly unregulated in terms of cost of production, they do not adopt or diffuse technologies, and they can exploit unskilled workers. These foreign firms are likely to move to other low-cost countries as labour costs increase in the domestic economy.

   e. A reduction in tax incentives could be offset by more progressive tax incentives for training, investment in capital, and innovation in the company. This could assist multinationals move up the production value-chain.

   f. The Government can use progressive tiers of fiscal incentives, identifying key elements of tax incentives and subsidies – pioneer status, capital progressive status, human capital development incentives, etc. This provides better targeting and reduces the moral hazard of multinational companies to "loop-hole" mine the tax system. It also provides better management of multinationals from pioneer status to more capital and technology-intensive status.

   g. Having tiered fiscal incentives will differentiate the truly committed multinationals; these could be appropriately compensated.

   h. The increased revenue collected from foreign operations could be effectively used for improvements in infrastructure, education of workers and to provide administrative services to the business community.

   i. The Government could consider amending the investment laws to reduce "loop-hole" mining in the system. There is already some consideration by the Government to revise the Investment Law to close "loop-holes".

3. **Public-Private Partnership (PPP) framework** is the key to creating externalities in the domestic economy. PPP is defined as partnerships between the public and private sectors to design, plan, finance, construct and/or operate projects traditionally provided by the Government. PPPs can achieve greater efficiency and cost effectiveness in the delivery of public services, greater value for money than traditional outsourcing, and can capitalize on private sector expertise. PPPs will also reduce the fiscal and revenue burden on the Government and focus on corporate social responsibility of private companies.

    a. Under the PPP arrangement for human capital development, a vocational training centre for a strong technical workforce could be jointly financed, constructed and operated by a group of private sector investors, with the Government.

    b. The training curriculum could be aligned towards the needs of the private sector thereby meeting the quality and skill requirements of companies (see Japanese-Singapore Technical Training Centre; Vietnamese-Korean Technical Education Centre).

    c. In turn, companies could send their workers to the training centre for training and upgrading their skills.

    d. The PPP arrangement could also consider scholarships and grants to young workers to pursue vocational and technical training relevant to the labour market.

    e. Under the PPP arrangement for infrastructure development, the Government could share the cost of infrastructure investment and the provision of government services to the public. This would reduce the fiscal burden and allow the Government to better allocate public funds.

    f. Under the PPP arrangement for labour market institutions and coordination of industrial policy, a tripartite framework of workers, employers and government could be set up to better manage the wage bargaining framework in the Cambodian economy.

4. The Cambodian Government should **develop local manufacturing and anchor industries**. One possible way to develop a local industrial base is to consider creating and supporting local anchor industries by promoting "Export-Promotion with Import-Substitution Policies". This could be achieved by locating domestic industries in SEZs, as well as developing SEZs for small and medium-sized enterprises (SMEs). This would help create clustering and agglomerative effects and positive externalities to form key backward and forward links for multinational activities.

    a. The SME SEZs could be progressively improved to leverage the growing regional production value-chain as the ASEAN Economic Community is formed in 2015-2018.

    b. As further incentive for these local SMEs, the Government could provide: (a) the necessary infrastructure to localize their activities; (b) incentives for training local workers; and (c) similar tax incentives and import duty exemptions currently available to multinationals.

    c. The Government could focus on global value-chain production tiers used by Japanese multinationals: Tier 1, Tier 2, Tier 3, etc. There is a need to develop supply chain mapping of the Cambodian industrial sector (manufacturing and services). There is an urgent need to do a study of the Cambodian economy.

d. Tax incentives to SMEs could be aligned with the quality of services and links provided to MNCs and the level of employment created in the domestic economy.

e. Government subsidies could be provided to SMEs for training and investment in capital.

5. There is a need to take a **differentiated approach in attracting FDIs**, as the types of multinational activities have different impacts on the domestic economy – Chinese, Japanese and Korean investments. The SWOT study suggests SEZs operated and managed by different foreign consortiums tend to have different impacts on the domestic economy in terms of employment, skills development and creating linkages to the domestic economy.

   a. The Government could create more competition across SEZs. It could set clear key performance indicators – identify best performing SEZs with good practices and benchmark other SEZs in the economy.

   b. The Government could encourage different operators, such as Japanese, Korean and Chinese investors to run SEZs to create greater competition. This would create agglomerative effects from the multinationals, and allow greater "trickle-down" effects from the activities of MNCs in the region.

6. There is a need for **institutional reform** in the Cambodian economy to reduce rent-seeking activities. This will increase government revenue and efficiency in the economy. The increase in government revenue could be used for human-capital development and infrastructure development.

   a. The increase in revenue could be allocated to increase the wages of civil servants and teachers.

7. The Government could consider **improving the structure and stature of the Council for the Development of Cambodia (CDC)** to a similar status as that of the Economic Development Board of Malaysia and Singapore. This would coordinate and strategize industrial development.

1. INTRODUCTION

Despite its size, in recent years Cambodia has achieved tremendous growth through its openness and market-based policies to support trade and investment. Since the 1990s, the Cambodian economy has experienced rapid growth. From 2008 to 2012, the average annual growth rate of Cambodia was around 5.6 percent and it achieved 7.5 percent in 2012.

The Cambodian economy grew at a rate of 7 percent per annum from 1998-2010, one of the fastest growing economies in ASEAN and Asia. The growth rate of for Cambodia has been high over the past two decades, even in comparison to its ASEAN neighbours. In 2011, the average growth rate of Cambodia was much higher than five other ASEAN countries: Indonesia, Malaysia, the Philippines, Singapore and Thailand (see Table 2). This is probably because of its low starting point after being ravaged by tremendous political conflict before 1991.

However, the global financial crisis revealed the need for the Cambodian economy to structurally adjust to more competitive industries away from the traditional sectors of garment manufacturing, tourism and construction. There is a strong need to diversify domestic industries and link to global production value-chains. This would increase the competiveness of domestic industries in export markets and is becoming an important development strategy. This new industrial development strategy is expected to avoid the "middle-income trap" by developing the key fundamentals for the Cambodian economy, such as human capital, technology and infrastructure.

The Cambodian economy is still an agrarian economy but it is rapidly shifting structurally towards the manufacturing sector. The agricultural sector is still dominant in the economy and is mainly focused on rice production (see Table 1). However, we observe that the output share of this sector has fallen over the years to around 30 percent of GDP. In contrast, manufacturing has grown rapidly in recent years, by about 15 percent per annum, but is dominated to some extent by just one industry, the garment and clothing industry. This accounts for more than half of the manufacturing output and most Cambodian exports. Compared to neighbouring Thailand, large agricultural processing and home-goods manufacturing typically observed in low-income economies are largely absent in Cambodian manufacturing, due to its proximity to large industrialized neighbours that can produce these goods more efficiently. Further, the Cambodian economy is dominated by a large services sector, mainly in tourism, restaurants and transport.

Table 1: Cambodia's Economic Structure

	1990	1995	2000	2005	2010	2012
GDP at current price in billion Riels	598.6	8,437.7	14,089.3	25,754.3	45,942.2	56,616.8
as % of GDP						
Agriculture	**55.6**	**47.4**	**35.9**	**30.7**	**33.8**	**33.6**
Industry	**11.2**	**14.3**	**21.8**	**25**	**21.6**	**29.7**
Mining	0.5	0.2	0.2	0.4	0.6	7.7
Manufacturing	5.2	9.1	16.0	17.8	14.9	15.1
Electricity, gas, and water	0.4	0.4	0.4	0.5	0.5	0.5
Construction	5.0	4.5	5.2	6.3	5.5	6.4
Services	**31.7**	**34.2**	**37.1**	**39.1**	**38.5**	**37.7**
Trade	9.4	14.6	14.4	13.5	13.8	13.6
Transportation	3.8	5.2	6.6	7.4	7.5	7.5
Finance	6.8	6.6	7.3	7.7	6.9	7.2
Public Administration	4.7	2.8	2.7	1.8	1.8	1.5
Other Industries	**7.0**	**4.9**	**6.1**	**8.6**	**14.0**	**7.9**
Less: Imputed bank service charges		**0.9**	**1.1**	**1.0**	**1.2**	**1.2**
Taxes less subsidies on production and Imports	**1.5**	**4.7**	**6.2**	**6.2**	**7.2**	**7.0**
Total	**100**	**100**	**100**	**100**	**100**	**100**

Source: ADB Statistical Database System

Table 2: Key Indicators of Some Asian Countries

Country	Gross Domestic Product at PPP (current international dollars, million)		GDP Per Capita at PPP (current international dollars, million)		Growth rates of Real GDP (%)		
	2000	Latest (2011)	2000	Latest (2011)	1990	2000	2011
China, People's Rep. of	2,987,949	11,347,450	2,357	8,422	3.8	8.4	9.2
Cambodia	11,440	33,805	918	2,328	1.2	8.4	7.1
Indonesia	496,572	1,131,166	2,412	4,682	9.0	4.9	6.5
Lao PDR	6,055	15,167 (2010)	1,190	…	6.7	6.3	…
Malaysia	212,058	464,830	9,028	16,034	9.0	8.9	5.1
Myanmar	…	…	…	…	2.8	13.7	…
Philippines	185,003	392,709	2,410	4,170	3.0	4.4	3.9
Singapore	136,012	316,741	33,767	61,103	10.1	9.0	4.9
Thailand	136,012	647,132	5,086	9,573	11.2	4.5	0.1
Viet Nam	109,999	301,728	1,426	3,435	5.1	6.8	5.9

Source: ADB Statistical Database System

It is clear from the Table 2 that the GDP per capita for Cambodia over the past decade has more than doubled, signifying the fast growth of the economy, even relative to population growth. It is also moving from a low-income country to a lower middle-income country and rapidly catching up with other emerging countries in Asia.

The growth of the manufacturing industry (see Table 3) has been strong, far above any of its ASEAN counterparts or even China. Given its economic liberalization policy in early 1990s, the industries have shown very strong growth. It increased significantly to 31 percent growth in 2000 from negative growth in 1990. However, this can be attributed to the fact that the base was low and the strong growth is purely driven by the base effect. But we still observed 14 percent growth in the industry in 2011. The impetus for strong industrial growth is significant for the Cambodian economy compared to other newly emerging ASEAN countries like Viet Nam. Although we observed strong growth in the manufacturing sector, it is necessary to delve into the composition of this industry. Garment manufacturing constitutes more than half of the total manufacturing activity of Cambodia. In fact, much of the un-milled paddy is processed across the border, even for domestic rice consumption.

Table 3: Growth Rates of Industry Real Value Added (%)

Country	1990	2000	2011
China, People's Rep. of	3.2	9.4	10.6
Cambodia	-2.1	31.2	14.5
Indonesia	11.5	5.9	5.3
Lao PDR	16.2	9.3	...
Malaysia	11.0	13.6	2.7
Myanmar	5.5	21.3	...
Philippines	2.6	6.5	2.3
Singapore	9.3	12.4	6.8
Thailand	16.1	2.7	-3.9
Viet Nam	2.3	10.1	5.5

Source: ADB Statistical Database System

The growth of services has been strong in Cambodia. This is primarily fuelled by the tourism sector and ancillary services like transportation and restaurants. Large official development assistance (ODA) and private inflows have encouraged the growth of modern-sector urban services, especially in Phnom Penh.

According to a policy paper produced by SNEC, the industrial development strategy has put focus on transforming the economic structure by providing more value added from a wider economic base that can ensure sustained growth with equity. The objective is to upgrade the economy through promoting the development of the industrial sector. This would lead Cambodia towards a 'new phase of economic base diversification' through the use of endowments and placing reliance on Cambodia's comparative advantages. In this effort, priorities would be: (1) promoting the development of agro-industry and agro-business in the medium term that supports the upgrading of important existing pillars of economic growth, such as the agriculture, garment and tourism sectors; (2) expanding the capacity of some handicraft and small industries which have the potential to evolve as core forces for promoting growth to serve export and domestic markets; and (3) discovering new industries with latent comparative advantages in order to link the Cambodian economy with the value-chain of regional and global production networks.

ASEAN and Asia are important for the sustained growth of Cambodia. Increasingly Cambodia is becoming an important and integral component of ASEAN integration and regional growth. ASEAN was institutionalized in August 1967 by five founding member countries, namely Indonesia, Malaysia, the Philippines, Singapore and Thailand. Brunei joined in 1984 forming the ASEAN-6. According to the ASEAN Vision 2020, ASEAN has set its goal as "a stable, prosperous and highly competitive ASEAN economic region in which there is a free flow of goods, services and investment and a freer flow of capital". It will be driven by two fundamental objectives: (1) accelerate growth; and (2) foster regional peace and stability. It is important to examine the role of the Cambodian economy as it integrates into the ASEAN Economic Community. However, there are several internal and external constraints that Cambodia needs to overcome. This project intends to examine these internal and external constraints and suggest possible policy responses to these constraints using the SWOT analysis.

In close collaboration with SNEC, UNDP is conducting an evidence-based policy study employing Strengths, Weaknesses, Opportunities, and Threats (SWOT) analysis on the Cambodian economy, with a specific focus on the manufacturing sector. This topic of study is part of discussions between UNDP and SNEC under UNDP's supporting work to the RGC.

The objective of the study is to support industrial policy to develop key industries that will increase the competitiveness of domestic industries and create sustainable and inclusive growth for the Cambodian economy. This is expected to create more equitable growth, with welfare improvements for the Cambodian people. The inputs of the study are expected to provide valuable insights to the RGC to develop its long-term vision for 2030.

The paper adopts the SWOT framework to analyze the potential of Cambodia's manufacturing sector. The SWOT analysis places its emphasis on identifying key problems and possibilities and creating a consensus for reform. In addition, the study also improve the Input-Output table for Cambodia to study the backward and forward linkages with domestic industries. The Input-Output table can be used to analyze production at its various stages in terms of intermediate inputs and final output. The output of the industries in the Input-Output table can be used to identify the various forward and backward linkages in the production process. The quantitative Input-Output analysis complements the qualitative SWOT analysis of Cambodia's manufacturing sector. The study visited four provinces: Battambang, Siem Reap, Svay Rieng and Sihanoukville, to do qualitative surveys and field work.

THE OBJECTIVES OF THE STUDY ARE TO:

a. study the potential of the Cambodian manufacturing sector in moving up the production and supply value-chain in the region. In particular, the study will examine the key challenges of the manufacturing sector in integrating with the ASEAN Economic Community in 2015, and the post-2015 development agenda.

b. review the Cambodian development policy and key macroeconomic trends at the aggregate and sectoral level. The study will evaluate the development policy in terms of the industrial policy and its links to the human capital development policy.

c. examine the links created by domestic industries to multinational activities in the manufacturing sector. In particular, it will use the Input-Output table for the Cambodian economy to study the backward and forward linkages of domestic industries to multinational activities.

2. FOREIGN DIRECT INVESTMENTS IN CAMBODIA

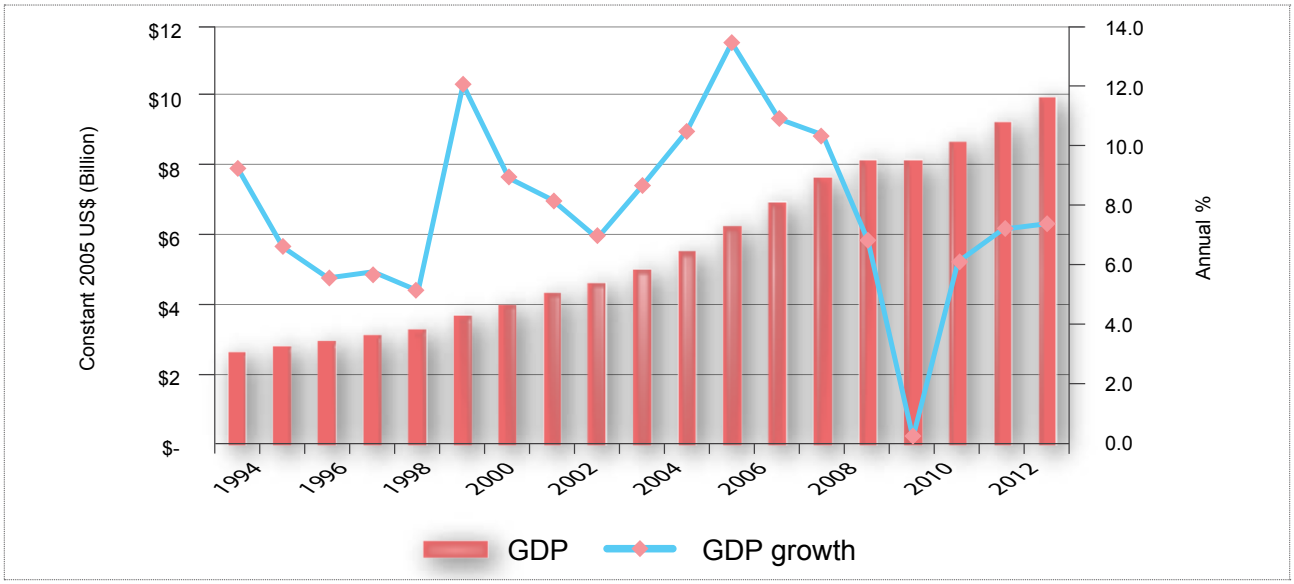
Cambodia is a small economy, with a population of 14.86 million people and a GDP (current US$) of $14.04 billion in 2012 (World Bank, 2014). As Figure 1 illustrates, Cambodia's economy has grown rapidly since 1991 when peace was restored with the Paris Peace Accord, and especially since 1998 with its re-entry into the UN. From 1994 to 2012, the average GDP growth rate was 7.7 percent per year (World Bank, 2014). Even though GDP growth dropped to 0.1 percent in 2009 during the world economic recession, it recovered in 2010 to 6.0 percent. The country's economic growth was driven by the return of peace and security and economic openness, accompanied by large public and private capital inflows, fairly judicious macroeconomic management, and a dynamic and integrating region (Hill and Menon, 2013).

Despite Cambodia's recent fast pace of economic growth, it remains a very poor country. Nearly 20.5 percent of the population still live under its national poverty line and the country is still classified by the United Nations (UN) as one of the "least developed countries".

Cambodia's economy is very open to trade and FDIs, owing to its geography, regional and international commitments, and policy choices. Its openness is underpinned by its membership in ASEAN since 1999, its ascension to the World Trade Organization (WTO) in 2004, and various bilateral free trade agreements. Another factor contributing to its trade openness is a gradual reduction of trade and related taxes (Hill and Menon, 2013).

Cambodia strives to attract FDIs with a relatively liberal foreign investment regime. Following the UN-backed national election in 1993 and the formation of the new coalition government, the Council for the Development of Cambodia (CDC) and Cambodian Investment Board (CIB) were established and became responsible for approving investment projects, both domestic and foreign. A Law on Investment that was drafted and approved by the National Assembly in 1994 stated that projects approved by the CDC are eligible to receive a variety of benefits, such as a concessionary corporate income tax rate, tax holidays, tax-free reinvestment of profits, tax-free repatriation of earnings and tax-free imports of capital and intermediate goods (Cuyvers et al., 2008). Furthermore, foreign investors can own up to 100 percent of investment projects. Although an amendment in 2003 increased corporate income tax to 20 percent, it also streamlined application procedures for foreign investments.

Figure 1: GDP and GDP Growth Rates, 1994-2012



Source: World Bank (2014)

Figure 2 shows the trend of net FDI inflows from 1994 to 2012. Net FDI inflows were fairly constant from 1994 to 2005, but grew rapidly from 2006 to 2012. Despite a drop in 2009 during the global economic recession, FDI inflows picked up in 2010 and peaked in 2012. The ratio of FDI to total investment approved by the CIB is approximately 61 percent for the period 2008-2012. The main sources of FDIs from 2008 to 2012 were China, Korea, the UK and the ASEAN countries, especially Viet Nam, Singapore, Malaysia and Thailand. Figure 3 shows the distribution of approved investment by sector during the period 2008-2012. The most popular sector for investment was tourism, which attracted 56 percent of investment. Industries attracted the second biggest share of FDIs with 22 percent. Among industries, energy, garment/textile and shoes, attracted the largest share of FDIs. A reason the tourism sector is popular for FDI is Cambodia's rich heritage and historical sites, especially the world-famous Angkor Wat temple complex (Cuyvers, 2011). What attracts FDIs to the garment industry is the Most Favoured Nation status given by the United States, and the General System of Preferences privileges given by the European Union, Japan, Australia and other developed countries (Tang and Wong, 2011).

Figure 2: Net FDI Inflows, 1994-2012

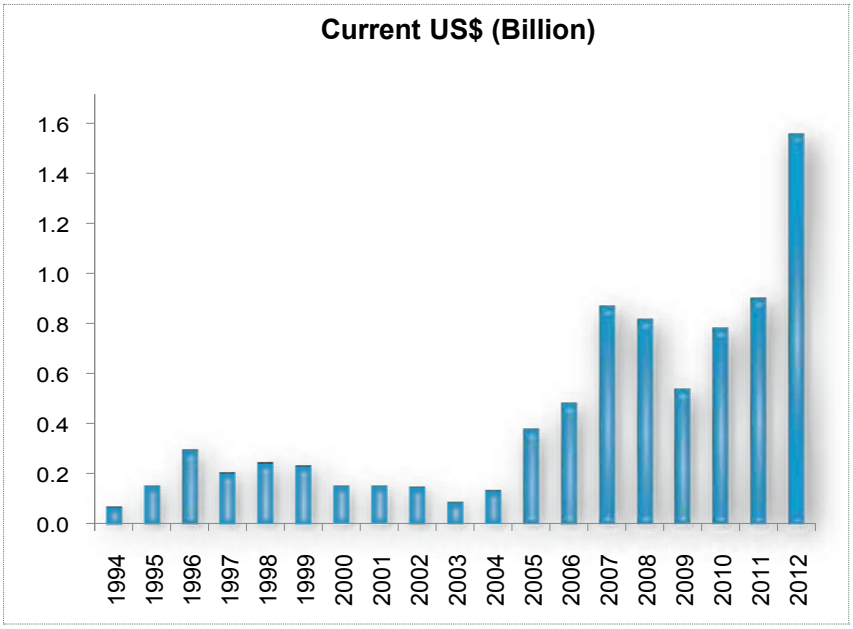
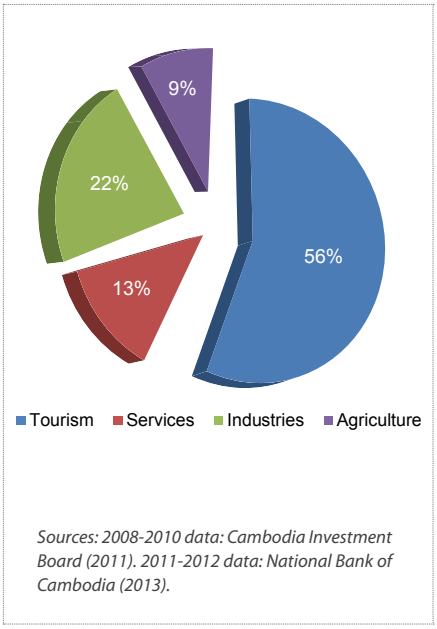


Figure 3: Distribution of Approved Investment by Sector, 2008-2012



Sources: 2008-2010 data: Cambodia Investment Board (2011). 2011-2012 data: National Bank of Cambodia (2013).

Source: World Bank (2014)

3. STRENGTHS, WEAKNESSES, OPPORTUNITIES AND THREATS (SWOT) ANALYSIS

The first part of the study will be conducting a SWOT analysis on the Cambodian economy, with a specific focus on the manufacturing sector. The focus of this SWOT analysis is to examine the constraints and opportunities of the manufacturing sector, as Cambodia strives to graduate from a low-income country to a middle-income country, and eventually reach high-income country status within the next several decades.

The study will focus on the overall economy and specific sectors that are likely to emerge as key competitive sectors in ASEAN and Asia. In particular, the study will focus on new sectors where Cambodia could emerge as a key competitor in the medium and long term. The key focus of the SWOT analysis is to analyze and audit the overall strategic position of the Cambodian economy in terms of its private sector, business environment and overall economic and social fundamentals.

The SWOT analysis is expected to develop key strategies to align the Cambodian economy to new emerging industries. These will enhance its overall competitiveness in the ASEAN Economic Community and the global economy. The study will focus on internal challenges (weaknesses) as well as external challenges (threats) to the Cambodian economy. The internal factors are institutional impediments, infrastructure development, social institutions and overall human capital. The external factors are the challenges from new emerging countries such as Viet Nam, Laos and Myanmar. The study will highlight the key potentials (strengths) that already exist and new emerging potentials (opportunities) of the Cambodian economy. A key aspect of the SWOT analysis is to improve the planning strategies that will maximize sustainable economic growth and the overall welfare of the Cambodian economy.

The strengths and weaknesses of the Cambodian economy and manufacturing industries could be examined through critical development constraints of the economy. In particular, the framework for growth diagnostics model of Hausmann, Rodrik and Velasco (2005) in the SWOT study will be useful. The advantage of this approach is that it provides a consistent framework for identifying the most critical and binding constraints to economic growth and for discerning the priorities and sequence of policies required to stimulate and sustain growth.

The SWOT study will be based on discussions with and survey of key stakeholders in the economy, including the private and public sectors. In addition, the study will cover the importance of global production value-chains and the integration of Cambodia into the ASEAN Economic Community. Through the SWOT framework, the study explores the differing types of foreign manufacturing firms in Cambodia. It also sheds light on the priorities of firms within the SEZ and suggests ways to strengthen Cambodia's manufacturing sector.

3.1 KEY RESULTS OF THE SWOT ANALYSIS

The findings of the SWOT survey were taken from a sample of 30 foreign and domestic firms (see Table 4)[1]. This SWOT study enables us to qualitatively assess the current and future needs of firms. These firms vary in size and across industries. In presenting the results, we will first assess the economy-wide findings before going into differences arising from the heterogeneous characteristics of firms.

Cambodia has been undergoing rapid economic development in the past decade. During this time, its manufacturing sector has been an important vehicle for economic growth. While many attribute Cambodia's manufacturing success to its cost advantage as a developing country, it has other valuable strengths. The manufacturing sector also has weaknesses, as seen from the recent union-led strike by textile workers, which is mainly due to a lack of transparent wage bargaining and strong labour market regulatory framework. Such weakness may inhibit the continuous development of the manufacturing sector.

Manufacturing firms see potential in Cambodia but are unable to fully capitalize on these advantages. These firms are attracted to the low labour costs in Cambodia and encouraged by government fiscal incentives (tax exemptions, tax holidays, import duty exemptions, etc.). They also benefit from easy access to foreign inputs and firms. However, these strengths are not exploited to the fullest extent. Though inexpensive, Cambodia's work force has on average, only a few years of formal education. This leads to low labour productivity, which erodes Cambodia's cost advantage in the region. In addition, the results highlight that favourable governmental policies are inefficient, as programmes by various ministries overlap each other.

The difficulties faced by firms are exacerbated by other weaknesses of the Cambodian economy. Firms face poor infrastructure in the form of inadequate roads, highways and internet connections. Their operations are frequently disrupted by electricity and water stoppages, and while labour is abundant, there is a lack of skilled workers in Cambodia. Foreign firms are not supported by domestic industrial linkages, having to import all their intermediate goods. Further, governmental regulations are weak, leaving firms to fend for themselves in times of strikes and riots. These weaknesses highlight the implicit cost of operations in Cambodia, which has been a rising concern for foreign firms.

The changing international landscape provides new sets of opportunities and challenges within the manufacturing sector. First, increasingly porous international borders provide an opportunity for Cambodia to train its workforce overseas in terms of acquiring knowledge about global production networks, new skills and new technologies. Second, Cambodia's participation in the ASEAN economic corridor and production value-chain mean it could attract new industries without having the entire spectrum of technical expertise. This is because the economy can initially focus on the lower-value portions of production before moving up the production value-chain. However the increasingly globalized environment does pose certain threats, one of which is the unregulated nature of foreign investors. These foreign firms will leave Cambodia if a cheaper production alternative such as Myanmar is available. This threat is heightened by Cambodia's lack of strong labour regulations and institutions.

Several labour-intensive firms, especially those in the garment industry, are attracted by the low labour costs, fiscal incentives and import incentives. But these firms tend to be unregulated in their production activities. Such firms

1 The survey attempted to capture key activities of the firms in and outside the SEZs. However, it is important to highlight that sub-sampling of the firms by key nationalities and specific industries posed challenges due to small sample sizes. Thus, the framework of this study could be extended in the future to study manufacturing activities in a comprehensive framework, capturing a larger number of firms across different industries, and also by region.

Table 4: SWOT Analysis for Selected Cambodian Manufacturing Companies (Ranking 1 is very important)

Strengths	Weaknesses
1. Labour market conditions (low labour cost and training development of workers) 2. Fiscal incentives (tax exemption, tax holidays, import-duty exemption, etc.) 3. Greater access to imports (foreign intermediate inputs) 4. Linking to foreign firms	1. Low labour productivity (low education) and rising cost of labour 2. Poor infrastructure – roads, highways, internet connections, etc. 3. Poor electricity and energy supply (including water supply) 4. Lack of skilled workers 5. Lack of domestic manufacturing base – lack of domestic industrial linkages 6. Weak labour regulations – management and enforcement 7. Poor legal and regulatory institutions – lack of regulation on tax exemptions and holidays (companies keep changing their registered company name to keep their tax holidays) 8. All intermediate inputs are imported – no domestic linkages
Opportunities	**Threats**
1. Strong educated and trained workers (training is important) 2. ASEAN integration and production value-chain 3. Proactive Government and business-friendly policy 4. Strong outlook for foreign investors (foreigners' expectations)	1. Lack of strong regulations – labour regulations 2. Emerging ASEAN countries such as Myanmar 3. "Hallowing-Out" of domestic industries – MNCs moving to neighbouring countries a. Lack of trained workers b. Rising cost of labour

are also less concerned with linkages with foreign firms and less likely to train locals or participate in the ASEAN production value-chain, preferring instead to produce low-technology and labour-intensive products for export. Due to the resource-seeking nature of these firms, they are unlikely to invest in PPP activities and/or domestic capacity building. They are unregulated and have a tendency to relocate their operations to countries with lower production costs.

It is interesting to observe that several multinationals with strong supply and production value-chains are keen to support the development of local industries and human capital, to strengthen the economy's links to global production and supply value-chains. For example, Japanese and Korean firms with strong global production networks are keen to develop domestic capabilities and have a longer-term investment plan. They participate in the ASEAN production value-chain, and aim to prepare the domestic industry for the influx of higher-value production stages from Thailand and Viet Nam. To achieve this, Japanese and Korean firms need to hire skilled foreign workers and establish links with foreign firms. As a result, they are more attracted to the ease of foreign access than to the low labour costs and fiscal incentives. In addition, the longer-term investment orientation of these firms also makes them more willing to invest and participate in PPP.

The study examines the priorities of firms operating within Cambodia's SEZs. While these firms highlight the low labour cost, they tend to value access to foreign goods and tax exemptions more. However, they are concerned with the weak domestic suppliers and lack of infrastructure support, including a poor or unreliable supply of electricity, water and telecommunication services, and weak SEZ operations. It has been noted that SEZs do not provide sufficient infrastructure or adequate policies and clustering effects. Firms in SEZs are concerned about the weak regulation framework, as some of their competitors have exploited the policy loop-hole whereby they could retain their tax exemptions and holidays by de-registering and changing the name of their company. Further, firms in SEZs have raised the issue of having no links to ASEAN production value-chains.

Table 5: Strengths and Weaknesses of SEZs in Cambodia

Strengths	Weaknesses
1. Access to foreign goods 2. Tax exemptions and import duty exemptions 3. Employment – low labour costs	1. Weak domestic suppliers 2. Poor infrastructure support a. Poor supply of electricity, water and telecommunication services b. Weak SEZ operations – not providing sufficient infrastructure, no forward-looking policies, weak in creating the clustering and agglomerative effects 3. Weak labour regulations and laws a. Weak regulation framework and policy for SEZs – "loop-hole" mining by foreign companies to retain their tax exemptions and holidays by de-registeringand changing the names of the companies 4. No links to ASEAN production value-chains

Taking an economy-wide perspective, several key trends can be observed. First, most firms value the role the Government plays both in the economy and in SEZs. In particular, firms have benefited from fiscal incentives and reduced tariffs. These incentives that the Government puts in place are effective in attracting firms to invest in Cambodia. Second, where firms see great opportunity, they also see weakness. While the labour market is seen as a great source of opportunity, due to the high potential of Cambodia's young labour force, it is also seen as its greatest weakness. The indigenous workforce has not been as productive as other developing countries, such as Viet Nam and Thailand. Apart from labour issues, the Government's role is also a key area of concern for firms. Firms see greater room for governmental initiatives in the future. Finally, all firms regardless of industry are threatened by global uncertainties such as the global recession and the strengthening of the US dollar.

While companies in SEZs are attracted by low-cost labour, non-SEZ firms place a higher emphasis on the role of the Government. This is also observed on the issue of imports/exports where SEZ firms value access to materials, while non-SEZ firms value pro-export policies of the Government. Second, non-SEZ companies see greater opportunity for product innovation and other research and development. This may be because they do not participate in the SEZ and so do not enjoy collaborative benefits. There are also similarities in the concerns of SEZ and non-SEZ firms. They are equally concerned about the lack of strong domestic links, as well as the possible demand shocks brought about by the global recession and the strengthening US dollar.

Firms vary in their perception of ASEAN developments. Japanese firms see more opportunities in the ASEAN production chain and ASEAN economic corridor. Finally, firms differ in their perception of weaknesses within the Cambodian economy. Compared to the Japanese, the Chinese are less concerned about the lack of information on customer markets and best practices.

The last dimension that this paper covers is the size of firms. To facilitate the study of differences between large and small firms, a large firm is defined as having 1,000 or more employees. Both large and small firms perceive the same generic strengths. However, smaller firms value the hiring of foreign labour, while larger firms value low-cost labour. In terms of opportunities, larger firms see more opportunities to participate in ASEAN, while smaller ones emphasize proactive governmental policies. As for weaknesses, larger firms are more affected by inefficient transportation, while smaller ones are more concerned with the inefficiency of governance. For firms in SEZs, larger ones have greater labour concerns, while smaller firms view domestic links as a key area of improvement.

4. LINKAGES AND SPILL-OVERS ANALYSIS ON THE MANUFACTURING SECTOR

FDI inflows can potentially benefit host countries through creating jobs, producing foreign exchange inflows, providing tax revenue and generating productivity spill-overs. Spill-overs take place when the presence of foreign firms in a host country leads to productivity gains in domestic firms and the foreign firms do not fully internalize these gains (Javorcik, 2004). Spill-overs can take place from foreign firms to domestic firms within the same industry (horizontal spill-overs) or in another industry (vertical spill-overs). In the latter case, spill-overs from foreign firms can accrue to domestic suppliers in upstream sectors (backward spill-overs) and domestic buyers in downstream sectors (forward spill-overs). The purpose of our study is to search for both horizontal as well as vertical spill-overs through backward and forward linkages in Cambodia. Our empirical results show that positive spill-overs take place through backward linkages between foreign firms and domestic suppliers. At the same time, we find little evidence of positive spill-overs taking place through horizontal and forward linkages. The full methodology and results are presented in Annex I.

There are only two existing studies that have examined spill-overs from FDIs in Cambodia. Both studies examine horizontal spill-overs but do not investigate vertical spill-overs through backward and forward linkages.

Cuyvers et al. (2008) examine horizontal spill-overs in Cambodia's manufacturing sector using firm-level cross-sectional data from the Survey of Industry Establishments conducted by the National Institute of Statistics, Ministry of Planning for the year 2000. They estimate a model with domestic firms' labour productivity as the dependent variable and capital intensity, material inputs intensity, share of foreign ownership, labour inputs, labour quality, firm size, use of proprietary technology or intangible assets, and two proxies for spill-overs from the presence of foreign firms in the subsectors as independent variables. The two proxies for horizontal spill-overs—the ratio of the employment of foreign firms to total employment in each subsector and the ratio of the output of foreign firms to total gross output in each subsector—are estimated separately. They find that the coefficients for both horizontal spill-over proxies are

positive and statistically significant. However, they also find that the economic significance of the spill-overs from the presence of foreign firms in the same industry is relatively low compared to those found in studies from some other developing countries. Cuyvers et al. (2008) suggest that the small coefficient estimates might be due to a relatively low level of economic development in Cambodia and the large number of joint ventures that have majority foreign ownership, as these firms might limit the scope of technology transfers to domestic firms.

Cheng (2012) examines horizontal spill-overs in Cambodia, the role of the technology gap and domestic firms' absorptive capacity as mediating factors that influence the extent of horizontal spill-overs. The study uses two-year panel data of 416 firms from a survey conducted by the World Bank for the years 2005 and 2006. The study regressed domestic firms' total factor productivity (TFP) on the presence of FDI in the same industries, absorptive capacity, the technology gap, and their interaction terms. It uses two proxies for absorptive capacity, namely the percentage of employees with higher education and a dummy for whether or not a firm offers training to its employees. The technology gap is defined as the difference between a firm's TFP and the average TFP of foreign firms in the sector. To address the problems of unobserved variables and simultaneous bias, the study uses random and fixed effect models. The study finds that FDI leads to horizontal spill-overs only under the condition of a positive technology gap.

4.1 DATA AND KEY TRENDS

This study uses data from the Economic Census of Cambodia 2011 conducted by the National Institute of Statistics (NIS). The census was conducted between 01 and 31 March 2011. The census covered all 505,134 establishments in Cambodia as of 01 March 2011 and is the first and only economic census that covered all establishments. The data set contains information on the nationality of the owner, industry of the establishment based on the United Nations International Standard Industrial Classification Revision 4 (ISIC Rev.4), location, number of employees, fixed assets, current assets, sales, other revenues, operating costs and operating expenses, including employees' salaries and wages. The numbers of domestic and foreign firms in each industry are presented in Table 6.

Table 6: Ownership of Firms by Industry

Sector	State-owned enterprises	Domestic firms (including SOEs)	Foreign firms	All firms	Percentage foreign firms
Mining	0	0	1	1	100.0
Food, Beverage & Tobacco	0	12	7	19	36.8
Textile & Garment	0	36	102	138	73.9
Wood, Paper & Publishing	0	6	6	12	50.0
Chemical, Rubber & Plastic	0	6	3	9	33.3
Non-metallic Mineral	0	0	2	2	100.0
Basic Metals	0	1	0	1	0.0
Other Manufacturing	0	5	7	12	58.3
Electricity & Water	6	15	2	17	11.8
Construction	0	11	4	15	26.7
Trade	0	108	36	144	25.0
Transport & Communication	1	54	28	82	34.1
Hotel & Restaurants	0	84	20	104	19.2
Finance	0	19	14	33	42.4
Real Estate & Business	0	7	2	9	22.2
Other Services	2	61	20	81	24.7
Total	9	425	254	679	37.4

Although the census covered 505,134 establishments, the number of observations we can use is drastically reduced after deleting observations with missing information on sales, fixed assets, and employee salaries and wages. After dropping those observations, our sample size consists of 679 establishments across 16 industries. With respect to ownership, the sample consists of 425 domestic firms and 254 foreign firms. The industry with most firms is the wholesale and retail trade industry with 144, followed by the textile and garment industry with 138, and the hotel and restaurant industry with 104 firms. The industry with the highest percentage of foreign firms is the textile and garment industry at 73.9 percent, followed by other manufacturing at 58.3 percent, and the wood, paper and publishing industry at 50 percent. For our econometric analysis, we further exclude the firms in industries that consist of two or fewer firms, as their horizontal linkage measures will not be meaningful.

Figure 4: Horizontal Linkages

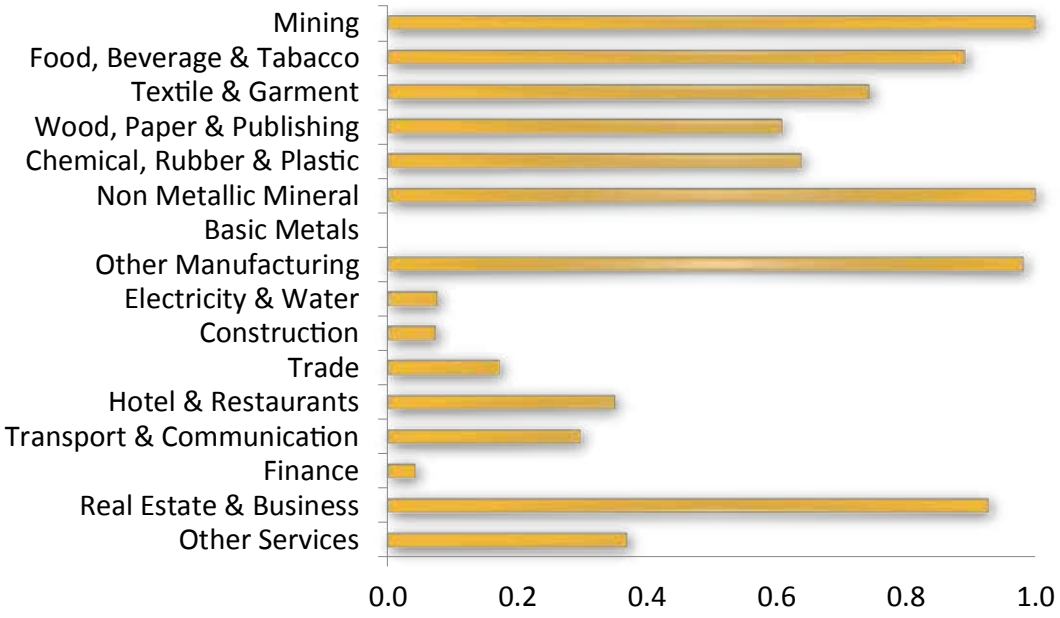


Figure 5: Backward Linkages

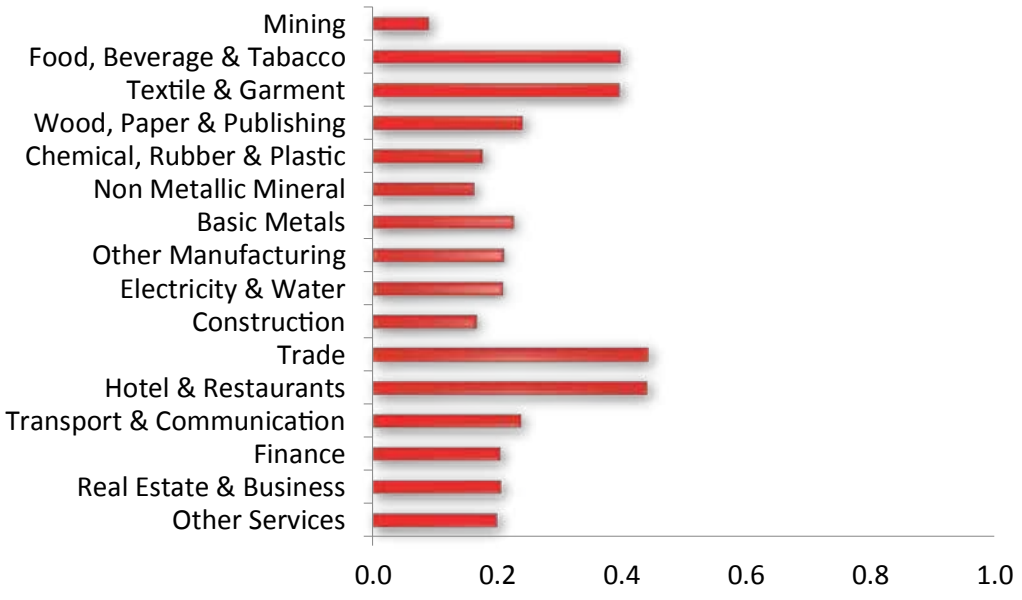
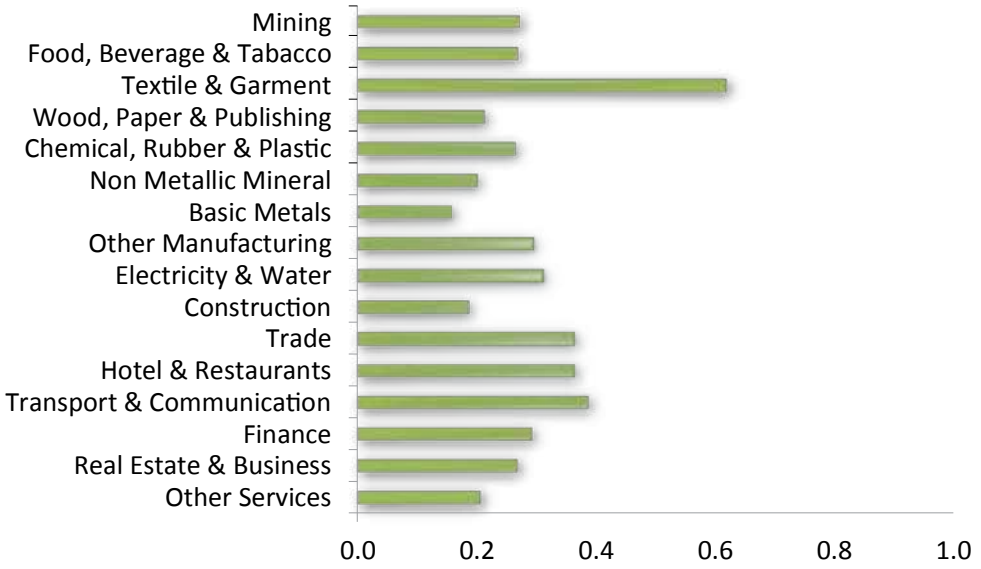


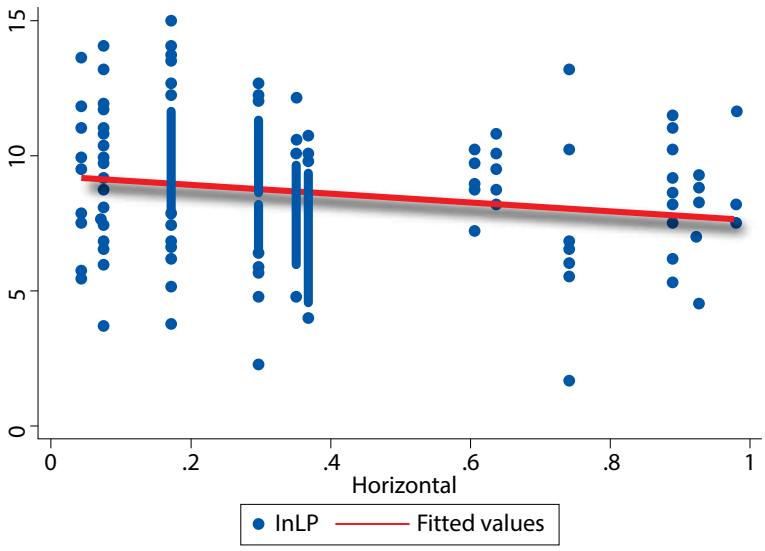
Figure 6: Forward Linkages



Figures 4 through 6 present the values of the horizontal, backward and forward linkage measures in each industry. There is considerable variation across industries for all variables. The industry with the highest horizontal value, i.e. the highest presence of foreign firms based on output, is the other manufacturing industry at 98.1 percent, while the industry with the lowest is finance at 4.3 percent[2]. For the backward linkage proxy, the highest value is measured in the wholesale and retail trade industry at 44.3 percent, while the lowest is in the mining industry at 9.0 percent. The proxy for forward linkages is the highest in the textile and garments industry at 61.8 percent and the lowest in basic metals at 15.8 percent.

To motivate our empirical analysis, we examine the relationship between the labour productivity of domestic firms and the presence of foreign firms in the same sector, as well as upstream and downstream sectors. Figures 7 through 9 illustrate the relationships between lnLP and Horizontal, Backward and Forward respectively. From the scatterplots, the relationship between labour productivity and backward linkages appears positive. However, there appears to be a negative relationship between labour productivity and horizontal linkages. There is no clear relationship between labour productivity and forward linkages.

Figure 7: Scatterplot of the Natural Logarithm of Labour Productivity (lnLP) on Horizontal



2 Both mining and non-metallic minerals have small numbers of firms, and are dominated by foreign firms.

Figure 8: Scatterplot of lnLP on Backward

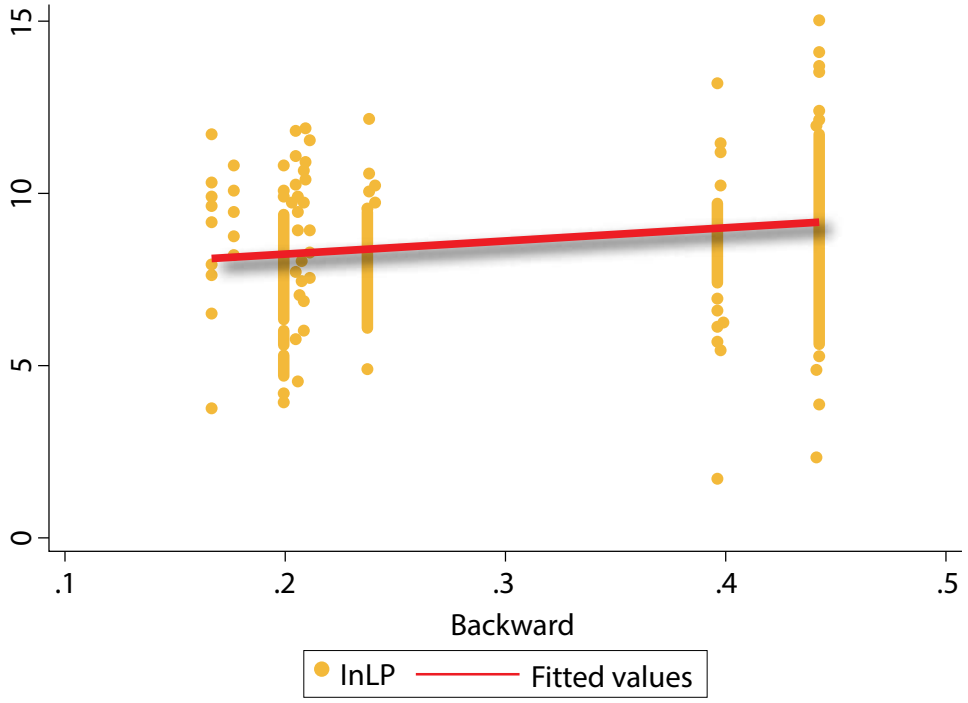
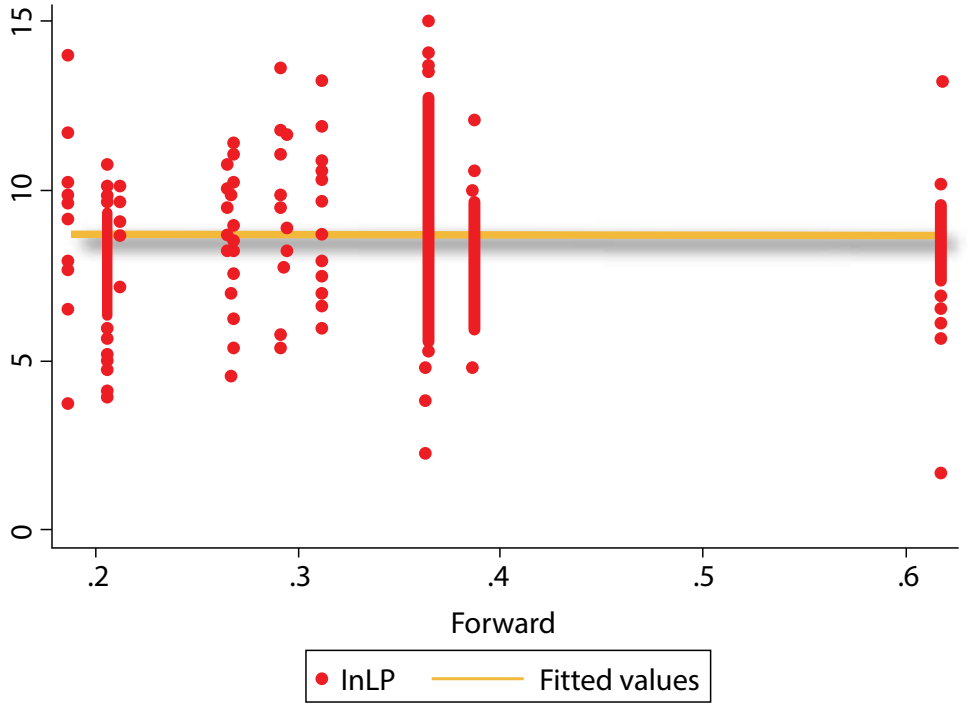


Figure 9: Scatterplot of lnLP on Forward



SUMMARY OF KEY RESULTS OF THE EMPIRICAL ANALYSIS:

a. We observe positive and statistically significant backward linkages for the services sector. However, we do not observe statistically significant backward linkages for the manufacturing sector. This lack of backward linkages for the manufacturing sector is critical as it mainly reflects the lack of a domestic industrial base. The domestic industrial base is important to create and strengthen domestic linkages to multinational and regional activities, and to global networks.

b. The horizontal linkages variable is negative and statistically significant. It is also negative and statistically significant for the services sector. We also observed that the forward linkages are negative for the overall manufacturing sector. Again, the lack of forward linkages, as with the backward linkages for manufacturing, reflects the weakness of domestic industries and lack of domestic industrial activities, especially from SMEs.

c. There is a significant technology gap between foreign and domestic firms. This again reflects that domestic firms do not have the absorptive capacity to use foreign technology and support innovative activities of multinational firms and regional production value-chain activities. However, we do observe positive impacts from the domestic absorptive capacity of the forward linkages.

d. We observed that higher productive domestic firms tend to enjoy higher horizontal linkages and benefit more from backward linkages of multinational activities.

5. CONCLUSION AND RECOMMENDATIONS

The study analyzed the overall competitiveness of the Cambodian manufacturing sector using the SWOT analysis. In addition, it examined linkages and spill-overs in the manufacturing sector from the multinational activities in the domestic economy. The SWOT study identified the strengths and weaknesses of the Cambodian economy. The following are the key recommendations from the SWOT and linkages study.

1) DEVELOPING HUMAN CAPITAL TO RETAIN MNCs

As a developing economy, Cambodia is endowed with a young workforce with low human capital in terms of only attaining primary school education. Many firms have identified low-cost labour as a reason to locate their operations in Cambodia. However, as labour costs start to increase due to the tight labour market, the challenge of maintaining multinationals in the economy will grow, especially as labour-abundant neighbouring countries, such as Myanmar, become competitive. This directly erodes Cambodia's competitive edge. To sustain the competitive edge of domestic manufacturing industries, the development of local human capital is crucial. To make up for rising wages, the productivity of Cambodian workers must improve. This can be achieved through: (a) educational reform to improve the average education to secondary level; and (b) increasing training and retooling programmes, such as progressive TVETs and CETs to develop human capital.

The development of progressive TVETs and CETs is one of the key important issues the Government needs to tackle. The returns could be reaped in a short to medium term (five years) in terms of immediately increasing the returns to the stock of human capital that exist in the economy. The Government could: (a) align and restructure current TVETs to be progressive TVETs, where there is a clear progression of skills training in the economy; (b) create a strong accreditation system for the CET and TVET training programmes, which will monetize the skill accumulation of workers; and (c) work closely with the business community to develop the CET and TVET curriculum (consider the PPP structure – to be discussed later).

Currently, there are more incentives for young people to work to support their family than to invest in their education. The Government could set up educational subsidies such as conditional cash transfers (CCT) directed at households to reduce the opportunity cost of working and increase the returns on investing in their education.

Further, most multinationals highlighted the need for basic STEM skills in undertaking key operations in their companies. Thus, developing human capital will help alleviate the skilled labour crunch and increase incentives to move towards capital-intensive production. The improvement of local human capital will reduce the reliance of local companies on foreign labour and will improve employment opportunities for local workers.

It is important to highlight that the manufacturing sector must create the types of jobs that will be quality based (inducement to technological progress), and that will increase wages and the standard of living of workers, as compared to the services sector. The services sector tends to experience low-quality jobs (low technology) and does not increase with the pace of technological development in the economy. However, it tends to increase with overall middle-class wealth and income.

Returns on human capital are based on strong labour institutions that could simultaneously increase returns to both employees and employers in terms of production and investment in the domestic economy. Developing strong

labour institutions that clearly define the regulations and protect the welfare of workers seems to be an important concern from the SWOT study. The study highlights that strong labour institutions, such as tripartite wage bargaining, consisting of government, employers and employees (unions), also helps align real wages to rising living costs in the economy.

2) ENACTING FISCAL REFORM IN PROVISION OF TAX EXEMPTIONS AND OTHER INCENTIVES

Given fiscal incentives have been the key attraction for multinational firms, especially Chinese firms, the Government could consider using this policy instrument to retain existing firms and attract others from Thailand and Viet Nam. Given that Chinese firms are cost-sensitive, a robust incentive package could potentially delay their inevitable exit from Cambodia to neighbouring Myanmar where wages are comparatively lower.

While using fiscal incentives to retain Chinese firms, reinforcing and operationalizing fiscal incentives is important. The following are key reforms for consideration:

a. Provide transparent and clear rules and regulations on tax incentives.

b. The Government should have several structures of tax incentives for investment in capital, technology and human capital. It should reduce tax exemption and import duty exemption as the main incentives to attract foreign companies. The SWOT survey highlights that several multinationals "loop-hole" mine the tax incentive system. They change their company registrations when their tax incentives expire after the stipulated years, thereby maintaining their tax incentive status for long periods. The Government needs to improve its enforcement of the tax incentive system and close "loop-hole" mining by companies. The Government needs to maintain clear regulations to progressively reduce tax incentives for multinationals that are maintaining their operations in the economy. This reduces the effectiveness of tax exemptions to assist and reduce the locational cost of foreign companies to establish their initial operations in the economy. The reduction of tax incentives could be offset with more progressive tax incentives for training, investment in capital, and innovation in the company. This could assist multinationals to move up the production value-chain (see Annex III of the tax incentive structure of Singapore to attract FDIs).

c. The effectiveness of the tax system is reflected by tax contributions and commitments of multinationals in the domestic economy. The revenue collected from foreign operations could be effectively used for improving infrastructure, educating workers and providing good administrative services to the business community. In addition, tax contributions from multinationals and the private sector ensure the fiscal sustainability of providing these amenities.

d. It is important to highlight that a strong and broad-based industrial structure will improve the fiscal sustainability of the economy in terms of government expenditure and revenue creation.

e. Having received feedback on "loop-hole" mining from the SWOT study, the Government could consider amending its investment laws. By plugging the gaps that firms can potentially exploit, the Government will ensure that all firms are on an equal playing field. Further, amending these laws will mean increased revenue for the Government. This revenue can then be used to bolster public services and finance human capital and infrastructural activities.

3) DEVELOPING STRONG PUBLIC PRIVATE PARTNERSHIP (PPP)

PPP is defined as partnerships between the public and private sectors to design, plan, finance, construct, and/or operate projects usually provided by the Government. Traditionally, the public sector has tended to engage the private sector merely to construct facilities or supply equipment. Public agencies then own and operate the facilities or equipment, or engage separate maintenance and operations companies to operate the facilities and equipment to

deliver the services. PPPs are an alternative form of procurement and route of delivery that allow the public sector to focus on acquiring services on the most cost-effective basis, rather than directly owning and operating assets. Examples of PPP include the development and operation of vocational training institutes and high schools, development of large-scale economic infrastructure (e.g. roads), amenities (water and other utilities) or social infrastructure (schools, hospitals and sports facilities). PPPs can achieve greater efficiency and cost-effectiveness in the delivery of public services. PPPs can provide greater value for money than traditional outsourcing.

PPPs allow the Government to focus its resources on its fundamental role of making policies to achieve efficiency and equity, while at the same time capitalizing on private sector expertise. In a PPP, a government's responsibility is to define the scope of business by specifying priorities, targets and outputs, as well as setting the regulation regime to ensure safety, quality and performance. For example, under a PPP arrangement, a vocational training centre to strengthen the technical workforce could be jointly financed, constructed and operated by a group of private sector investors, with the government. The training curriculum could be aligned towards the needs of the private sector thereby meeting the quality and skills requirements of the companies (see Japanese-Singapore Technical Training Centre; Vietnamese-Korean Technical Education Centre). In turn, the companies could send their workers to the training centre for training and upgrading their skills. The PPP arrangement could consider scholarships and grants to young workers to pursue vocational and technical training relevant to the labour market (Please see Annex II for a write-up on PPP).

4) DEVELOPING LOCAL MANUFACTURING AND ANCHOR INDUSTRIES

Apart from relying on foreign firms, the Cambodian Government should develop local manufacturing and anchor industries. This could form an important base for "Import-Substitution with Export-Promotion Policies". This could be achieved by locating domestic industries in SEZs and developing SEZs for small and medium enterprises. This will help create clustering and agglomerative effects and positive externalities to form key backward and forward links for multinational activities. The SME SEZs could be progressively improved to leverage the growing regional production value-chain as the ASEAN Economic Community is formed in 2015-2018. To further incentivize these local SMEs, the Government could provide: (a) the necessary infrastructure to localize their activities; (b) incentives for training local workers; and (c) similar tax incentives and import duty exemptions currently available to multinationals.

5) CREATING COMPETITION ACROSS SPECIAL ECONOMIC ZONES

The Government could consider creating more competition across Cambodia's many SEZs. This could be done by benchmarking SEZs' performance to clear best performance indicators such as local employment creation, training of local workers, investment in creating local linkages, undertaking corporate social responsibility and investing in local communities. Greater incentives could be provided for those SEZs that meet performance indicators, such as creating local employment, creating local industry and using local content. To remain competitive, zone operators should attempt to improve their ranking by working on achieving key performance indicators. This would raise the quality of service provided, resolving the problem of inadequacies.

A second approach would be to encourage different operators such as Japanese, Korean or Chinese operators to run SEZs and thus create greater competition across SEZs. The increase in competition would allow greater 'trickle-down' effects from the activities of these MNCs and agglomerative effects from multinationals. Further, firms who continue to be dissatisfied with their zone operator could consider moving to another SEZ instead of exiting Cambodia altogether. This ability to shift to another operator would give participating firms leverage. With more bargaining power, firms could negotiate more effectively with the zone operators. This negotiation would help keep the rates and services within Cambodian SEZs competitive by both national and international standards.

6) DIFFERENTIATING POLICIES AIMED AT ATTRACTING FDIs FROM FIRMS OF CHINESE AND JAPANESE ORIGIN

The SWOT analysis reveals that Chinese and Japanese multinationals are driven by different incentives to invest in the Cambodian economy. Chinese investments are driven more by labour cost and cost of production in Cambodia.

In contrast, the Japanese are driven by the production value-chain that is likely to be developed in Cambodia as the domestic economy starts to integrate with regional and global production value-chains. As Chinese and Japanese manufacturing firms are seen to have different priorities, the Government could consider providing a different set of incentives for each of them. Incentives targeted at Chinese firms should fully exploit their cost orientation and provide ways to reduce their operating costs. On the other hand, the Cambodian Government could expedite foreign access and increase the ease of hiring foreign workers for Japanese firms. It could proactively engage Japanese firms for PPP, as the latter has expressed strong willingness to participate in such projects.

The Cambodian Government should target Japanese investments to capitalize on their willingness to develop domestic capacities. Doing so would expedite the development of domestic supporting industries. With domestic linkages set up, these multinationals would have less incentive to relocate their operations. Further, the transfer of knowledge and technical know-how would allow Cambodia to move up a tier in ASEAN's value-chain production line. This is especially true given that the Japanese firms seem to have a clear idea of production value-chains in the region. By being able to produce more value-added products, Cambodia could compete alongside Thailand and Viet Nam.

7) ENACTING INSTITUTIONAL REFORMS TO REDUCE RENT SEEKING

The SWOT study indicates that there are generally concerns with regard to rent-seeking activities in the SEZs and also in the domestic economy. The Cambodian Government can enact institutional reforms to reduce rent seeking. Rent seeking refers to attempts to obtain income in excess of that needed to continue production. Examples include attempts to obtain monopoly privileges. As these activities do not generate wealth, reducing them will increase allocative efficiency and governmental revenue that could be effectively targeted towards education, improving salaries of teachers, improving salaries of civil servants and improving the quality of public services. This increase in revenue will allow the Government to finance human capital and infrastructure development. It can also be used to increase the wages of civil servants and teachers in an effort to increase the quality of public services and education in Cambodia.

8) CREATING AN ECONOMIC STATUTORY BOARD THAT FOCUSES ON FOREIGN INVESTMENT ACTIVITIES

Cambodia can consider creating an economic statutory board, like the Singapore Economic Development Board or the Malaysian Economic Development Board, to coordinate and strategize industrial development with foreign direct investment. By centralizing all ministerial industrial efforts, the Cambodian Government can boost its efficiency and avoid programme overlaps. This will also reduce the number of loop-holes that firms can exploit, creating a more transparent and even playing field within the business environment.

It is important to highlight that government policies play an important role in creating the industrial base and also managing foreign investment activities in the domestic economy. Creating the domestic absorptive capacity to engage and enhance spill-overs from multinational activities must be one of the key considerations of the Cambodian Government. Government policies have an important role in promoting positive productivity spill-overs from foreign firms. Policies can affect the amount and type of FDI inflows, the extent of links between domestic and foreign firms, and the potential of domestic firms to absorb technological spill-overs from foreign firms. Cambodia's openness to trade and its liberal FDI regime have led to rapid growth in FDI inflows over the last decade, accompanied by robust economic growth. Our findings suggest that strengthening the linkages between domestic suppliers and foreign firms enhances the productivity of domestic firms. As Thangavelu and Pattnayak (2006) highlight, the extent to which multinational firms establish linkages with domestic suppliers depends on the availability of qualified domestic suppliers. Encouraging firms through incentives to acquire new technology and investing in human capital through education and training are important ways to increase the technological capabilities of domestic firms. Increasing the technological capabilities of domestic firms not only raises their productivity directly, but also increases their potential to establish linkages with foreign firms and hence benefit from technological spill-overs. The linkages and positive spill-overs could create a virtuous cycle of productivity improvement.

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ANNEX I: METHODOLOGY AND RESULTS OF LINKAGES ANALYSIS

To derive the linkages between different industries, we use an IO table. The IO table divides firms into 22 industries and shows the values of transactions between the different industries. To the best of our knowledge, the most recent update of an IO table for the Cambodian economy was done in 2008. We updated the 2008 IO table using 2010 data from the census, by carrying out the RAS procedure, which is also known as the bi-proportional matrix balancing technique.

The RAS procedure is a method of updating input-output tables without carrying out full surveys (Miller and Blair, 2009). Producing an input-output table from a full survey of establishments in an economy is an expensive and time-consuming task. Therefore, these techniques of updating input-output tables are much more practical and are important to modern applications of input-output analysis.

We update the 2008 input-output table by following the procedure as explained in Miller and Blair (2009). Some of the data needed for the proper RAS techniques are unavailable. We attempt to overcome this data constraint by creating proxies using available information from the census. Given an existing input-output table, the proper RAS technique requires three pieces of information for the year of interest to update the coefficients: (1) total gross output for each industry; (2) total inter-industry sales (total output less sales to final demand) for each industry; and (3) total inter-industry purchases (total purchases less purchases from the "payments sector", which include labour inputs, imported inputs, taxes, interest and rental) for each industry.

As the census covers all establishments in the country, we can reasonably calculate the total gross output for each industry. However, the census does not distinguish between inter-industry sales and sales to final demand. To estimate the total inter-industry (or intermediate) sales for each industry, we assume that the ratio of inter-industry sales to total sales is the same as 2008. We then estimate inter-industry sales in 2010 by multiplying total sales in 2010 by this ratio. The census does not differentiate between purchases of domestic goods and imported goods. We proxy for each industry's intermediate purchases by assuming that the ratio of domestic goods purchases to total goods purchases is the same as 2008, and multiplying the total inputs by this ratio.

METHODOLOGY

To examine spill-overs from the presence of foreign firms on domestic firms, most empirical studies use labour productivity or total factor productivity of domestic firms as the dependent variable. They use proxies for the presence of foreign firms in industries, such as the foreign firms' share of total employment or the foreign firms' share of industrial output, as explanatory variables. Following Javorcik (2004), we define a Cobb-Douglas production function in log-linear form:

$$\ln Y_i = \alpha + \beta_1 \ln K_i + \beta_2 \ln W_i + \beta_3 \text{Foreign}_i + \beta_4 \text{Horizontal}_j + \beta_5 \text{Backward}_j + \beta_6 \text{Forward}_j + \varepsilon_i \quad (1)$$

Yi denotes the real output of firm i, measured by operating revenues; Ki denotes capital and is defined as the value of fixed assets at the beginning of the year; Li denotes labour and is measured by salaries and wages. Foreigni is a dummy variable that takes the value 1 when firm i is foreign-owned, and 0 when the firm is Cambodian owned. In the case of joint ownership, the nationality of the largest shareholder prevails.

Horizontalj captures the extent of foreign presence in sector j and is defined as the ratio of the output of foreign firms to the total gross output of the sector. We can express it as:

$$\text{Horizontal}_i = \left[\sum_{i \forall i \in j} \text{Foreign}_i * Y_i\right] \Big/ \sum_{i \forall i \in j} Y_i \qquad (2)$$

Backwardj is a proxy for the presence of foreign firms in the industries that are supplied by sector j. It is intended to capture the extent of potential contacts between domestic suppliers and multinational customers. In other words:

$$\text{Backward}_j = \sum_{k \neq j} \alpha_{jk} \text{Horizontal}_k \qquad (3)$$

α_{jk} is the proportion of sector j's output that is supplied to sector k and is calculated from the input output matrix. The value of the variable increases with the foreign presence in sectors supplied by sector j and the share of intermediate goods supplied to these sectors with foreign presence.

Forwardj is a proxy for the presence of foreign firms in upstream sectors. It is defined as the share of output in upstream sectors produced by firms with foreign ownership. In other words:

$$\text{Forward}_j = \sum_{m \neq j} \sigma_{jm} \text{Horizontal}_k \qquad (4)$$

σ_{jm} is the proportion of inputs purchased by industry j from industry m in total inputs sourced by industry j. The value of the variable increases with the foreign presence in upstream sectors and also with the share of intermediate goods supplied by these sectors.

Following Cuyvers et al. (2008), we obtain the labour productivity equation by subtracting from both sides of equation (1):

$$\ln\left(\frac{Y_i}{L_i}\right) = \alpha + \beta_1 \ln\left(\frac{K_i}{L_i}\right) + \beta_2 \ln\left(\frac{W_i}{L_i}\right) + \beta_3 \text{Foreign}_i + \beta_4 \text{Horizontal}_j + \beta_5 \text{Backward}_j + \beta_6 \text{Forward}_j + \varepsilon_i \qquad (5)$$

Equation (5) can also be written as:

$$\ln LP_i = \alpha + \beta_1 \ln KI_i + \beta_2 \ln w_i + \beta_3 \text{Foreign}_i + \beta_4 \text{Horizontal}_j + \beta_5 \text{Backward}_j + \beta_6 \text{Forward}_j + \varepsilon_i \qquad (6)$$

Equation (6) is the model that we estimate in our baseline regression. LPi represents labour productivity measured as output per worker; KIi represents capital intensity measured as fixed assets per worker; and wi represents the average wage.

To examine the extent to which the absorptive capacity and technology gap of domestic firms affect productivity spill-overs, we include the interaction terms of the measures of horizontal, backward and forward linkages with proxies for absorptive capacity and the technology gap. As a proxy for absorptive capacity, we measure the use of proprietary technology or intangible assets as the royalty expenses per employee in each firm. The technology gap is defined as the difference between a firm's labour productivity and the mean labour productivity of all foreign firms in the same industry, over the mean labour productivity of all foreign firms in the same industry. The technology gap for firm i belonging in industry j is calculated as:

$$\text{TechGap}_i = \frac{\left[\sum_{i \forall i \in j} \text{Foreign}_i * \text{LP}_i\right] / n - \text{LP}_i}{\left[\sum_{i \forall i \in j} \text{Foreign}_i * \text{LP}_i\right] / n} \quad (7)$$

Where n is the number of foreign firms in industry j. A positive technology gap means that the firm's labour productivity is lower than the average of the foreign firms, which we use to represent the technology frontier. Table A1 presents the mean values of the technology gap and proxy for absorptive capacity. The mean technology gap for all domestic firms is slightly below zero, which suggests that on average domestic firms do not lag behind foreign firms in labour productivity. However, at the industry level, domestic firms in a majority of industries are below the technology frontier, with the exception of textile and garment; wood paper and publishing; construction; and finance. We estimate the following model:

$$\begin{aligned} \ln \text{LP}_i = {} & \alpha + \beta_1 \ln \text{KI}_i + \beta_2 \ln w_i + \beta_4 \text{Horizontal}_j + \beta_5 \text{Backward}_j + \beta_6 \text{Forward}_j \\ & + \beta_7 \text{AC}_i * \text{Horizontal}_j + \beta_8 \text{AC}_i * \text{Backward}_j + \beta_9 \text{AC}_i * \text{Forward}_j + \beta_{10} \text{AC}_i \\ & + \beta_{11} \text{TechGap}_i * \text{Horizontal}_j + \beta_{12} \text{TechGap}_i * \text{Backward}_j + \beta_{13} \text{TechGap}_i * \text{Forward}_j \\ & + \beta_{14} \text{TechGap}_i + \varepsilon_i \end{aligned} \quad (8)$$

Table A1: Means of Absorptive Capacity and Technology Gap by Industry

	AC	TechGap
Food, Beverage & Tobacco	42.055	0.714
Textile & Garment	0.138	-1.651
Wood, Paper & Publishing	0.000	-0.436
Chemical, Rubber & Plastic	0.000	0.746
Other Manufacturing	0.000	0.281
Electricity & Water	1.082	0.692
Construction	0.000	-0.629
Trade	0.000	-0.507
Hotels & Restaurants	0.521	0.096
Transport & Communication	2.180	0.426
Finance	10.624	-2.789
Real Estate & Business	0.000	0.871
Other Services	4.864	0.752

ESTIMATION RESULTS

OLS Regressions

Table A2 presents a correlation matrix for the variables. The correlation coefficients between the independent variables are reasonably low, which implies that there is no serious multi-collinearity problem.

Table A2: Correlation Matrix

	lnLP	lnKI	lnw	Horizo-I	Backward	Forward	TechGap
lnLP	1.0000						
lnKI	0.3322 0.0000	1.0000					
lnw	0.5360 0.0000	0.3485 0.0000	1.0000				
Horizontal	-0.0706 0.1041	-0.2142 0.0000	-0.3896 0.0000	1.0000			
Backward	0.0071 0.8707	-0.2354 0.0000	-0.3240 0.0000	0.5604 0.0000	1.0000		
Forward	-0.1168 0.0071	0.1031 0.0175	-0.2093 0.0000	-0.0211 0.6282	0.3019 0.0000	1.0000	
TechGap	-0.3776 0.0000	-0.1720 0.0000	-0.1789 0.0000	0.0055 0.8996	-0.0482 0.2680	-0.0468 0.2813	1.0000
AC	0.1043 0.0171	0.1091 0.0126	0.1624 0.0002	-0.0598 0.1723	-0.0266 0.5445	-0.0831 0.0577	-0.0005 0.9902

Since the proxies for variables are aggregated industry-specific variables, the standard errors might potentially be correlated within the same industries, which will lead the standard errors from OLS to be underestimated (Javorcik, 2004). Failing to take into account these errors will result in downward bias in the estimated errors and lead to spurious results for the aggregate variable of interest. To tackle this issue, the above model is estimated using cluster-robust standard errors.

Table A3: Results from OLS Regressions

	(1) All	(2) Domestic	(3) Industry_D-s	(4) Manufactur-g	(5) Services	(6) Interactions
lnKI	0.1544** (0.0438)	0.1464** (0.0374)	0.1526** (0.0384)	0.2082 (0.1758)	0.1047** (0.0206)	0.1137* (0.0417)
lnw	0.6676** (0.1553)	0.8750*** (0.0873)	0.8878*** (0.1058)	0.4946 (0.2409)	0.9633*** (0.0575)	0.8072*** (0.1041)
Foreign	0.2057 (0.1599)					
Horizontal	0.2811 (0.6001)	-0.3287 (0.5229)	-0.8367*** (0.0215)	-0.6991 (0.8577)	-0.8659** (0.1805)	0.5161 (0.5532)
Backward	2.0726** (0.6642)	2.8414*** (0.6043)	2.8363*** (0.1198)	-0.6653 (0.5798)	2.2467*** (0.1114)	0.8777 (0.8068)
Forward	-1.1421 (0.7700)	-1.2753 (0.6332)	-1.3869* (0.5383)	-0.0090 (0.4999)	-0.6883 (0.2631)	-1.6549** (0.4430)
TechGapHor-l						-1.3565* (0.5607)
TechGapBac-d						2.3017* (0.9056)
TechGapFor-d						0.4974 (0.4496)
ACHorizontal						0.0140 (0.0064)
ACBackward						0.0018 (0.0066)
ACForward						0.0304* (0.0117)
TechGap						-1.0396 (0.4785)
AC						-0.0219** (0.0059)
_cons	2.2985 (1.1546)	0.9570 (0.6847)	0.9285* (0.3717)	4.9068*** (0.5352)	0.5622 (0.5320)	2.5524* (0.9459)
N **r2_a** **F**	531 0.3648 51.2822	316 0.4543 86.5889	316 0.4817 -	65 0.1781 -	225 0.5302 -	311 0.5152 -

Standard errors in Parentheses
p<0.05, ** p<0.01, *** p<0.001

Table A3 contains results from OLS regressions. Column 1 presents the results for the baseline regression for the full sample. Since our dependent variable is the labour productivity of domestic firms, we drop the foreign firms from our sample. Column 2 presents the results for the baseline regression for domestic firms. For both Columns 1 and 2, the coefficient on the proxy for spill-overs through backward linkages is positive and statistically significant. Furthermore, the magnitude of the effect is economically meaningful. Based on the coefficient in Column 2, a one-standard-deviation increase in foreign presence in downstream sectors (i.e. a 16 percentage point increase in the Backward variable) is associated with a 46 percent increase in the output of domestic firms in the supplying industries.

From Columns 1 and 2, there is little evidence of positive spill-overs taking place through other channels. The coefficient on the Horizontal variable does not appear to be statically significant, which is consistent with some studies that fail to find a positive intra-industry effect from FDI in developing countries (e.g. Aitken and Harrison, 1999; Javorcik, 2004). The Forward coefficient bears a negative sign, but is not statistically significant.

To control industry-specific effects that are not captured by the other independent variables, we then include industry dummies. The results are presented in Column 3. Again, the coefficient of the Backward variable is positive and statistically significant. However, the negative coefficients of Horizontal and Forward both become statistically significant.

Columns 4 and 5 present the results for the baseline regression for firms from the manufacturing and services sectors respectively. For the manufacturing sector, all the independent variables become statistically insignificant. For the services sector, the coefficient of the Horizontal variable is negative and statistically significant, and the coefficient of the Backward variable is positive and statistically significant. The results suggest that domestic firms in the services sector benefit from the presence of foreign firms in downstream industries but are adversely affected by foreign firms in the same industries.

Column 6 shows the results for the regression with interaction terms. The coefficient of Horizontal is positive but not statistically significant, but the interaction term between Horizontal and the technology gap is negative and statistically significant. This suggests that in the case of Cambodia, domestic firms with a wider technology gap are more adversely affected by the presence of foreign firms in the same industry. This could be because less efficient domestic firms suffer more from the negative competition effects, are forced to scale down their production and become less productive.

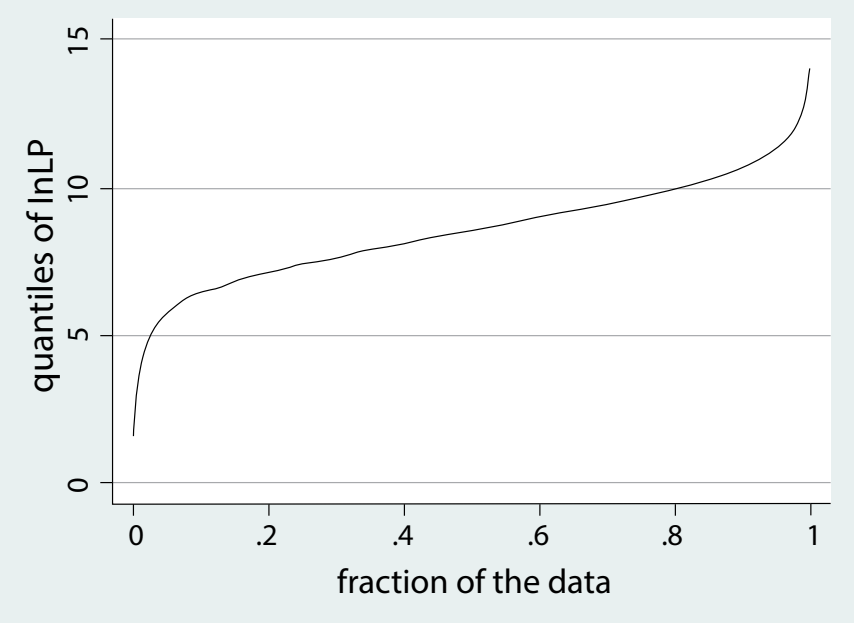
The coefficient of Backward becomes statistically insignificant. However, the coefficient of TechGap*Backward is positive and statistically significant. This suggests that domestic firms with a wider technology gap benefit more from the presence of foreign firms in downstream sectors.

The coefficient of Forward is negative and statistically significant. However, the coefficient of the interaction term AC*Forward is positive and statistically significant. This suggests that while on average there is no evidence of positive spill-overs from forward linkages, domestic firms with higher absorptive capacity benefit more from the presence of foreign firms in upstream industries.

Quantile Regressions

To provide a more complete picture of the relationship between the labour productivity of domestic firms and FDI, we use quantile regression (QR) on our model in equation (6). QR world provides information about the relationship at different points in the conditional distribution of lnLP. In addition, QR is semi-parametric as it avoids assumptions about the parametric distribution of regression errors, making it appropriate for heteroskedastic data. Figure A1 illustrates the quantiles of lnLP graphically.

Figure A1: Quantile Plot for lnLP



We perform the QRs at different quantiles, namely the quartiles q = 0.25, 0.50 and 0.75. Table A4 compares the results with one another and also with the OLS estimates. The coefficients vary considerably across quantiles. The Horizontal variable is only statistically significant for the median regression and bears a negative sign. The Backward variable is positive and statistically significant across all quantiles. We can also see that backward linkages have a much greater effect at the higher conditional quantiles of labour productivity. The Forward variable is negative and statistically significant across all quantiles. The negative effects from forward linkages are greater at the higher conditional quantiles of labour productivity. The median regression coefficients are fairly similar to the OLS coefficients.

Table A4: Results from Quantile Regressions

Variable	OLS	QR_25	QR_50	QR_75
lnKI	0.146**	0.149***	0.137***	0.111*
lnw	0.875***	0.930***	0.880***	0.858***
Horizontal	-0.329	0.051	-0.510*	-0.398
Backward	2.841***	2.075**	2.984***	4.218***
Forward	-1.275	-1.533*	-1.670***	-2.655***
_Cons	0.957	0.248	1.262**	2.275***

legend: * p<0.05; **p<0.01; *** p<0.01

OLS Regressions using updated IO Table

We run the same OLS regressions using the updated IO table that we obtain from carrying out the RAS procedure. The results are presented in Table A5. Qualitatively, the results are similar to those using the 2008 IO table. Once again, Column 1 presents the results for the baseline regression for the full sample and Column 2 presents the results

for the baseline regression for domestic firms. For both Columns 1 and 2, the coefficient on the proxy for spill-overs through backward linkages is positive and statistically significant. From Columns 1 and 2, there is little evidence of positive spill-overs taking place through other channels. The coefficients of the Horizontal and Forward variables do not appear to be statically significant.

Table A5: OLS Regressions using Updated IO Table

	(1) All	(2) Domestic	(3) Industry_D-s	(4) Manufactur-g	(5) Services	(6) Interactions
lnKl	0.1604*** (0.0365)	0.1672** (0.0421)	0.1806*** (0.0386)	0.2126 (0.1751)	0.1627* (0.0422)	0.1083* (0.0371)
lnw	0.6487*** (0.1241)	0.8315*** (0.0691)	0.8568*** (0.0792)	0.4907 (0.2411)	0.8733*** (0.0455)	0.7352*** (0.0734)
Foreign	0.1193 (0.1876)					
Horizontal	0.3159 (0.5009)	-0.3763 (0.4847)	-1.2814*** (0.0245)	-0.4485 (0.7635)	-2.0478* (0.7623)	0.5112 (0.4531)
Backward	4.8293* (1.6460)	4.8709* (1.6747)	8.6949*** (0.5638)	-1.8297 (1.1016)	5.2795* (1.6123)	4.9048** (1.5202)
Forward	-0.8999 (1.1101)	-0.2000 (1.2993)	-0.8784 (0.9566)	0.1468 (0.7894)	-1.1160 (0.9937)	-2.7249* (1.1209)
ACHorizontal						0.0089 (0.0051)
ACBackward						-0.0252 (0.0240)
ACForward						0.0438 (0.0299)
AC						-0.0096* (0.0038)
TechGapHor-l						-1.4626*** (0.2590)
TechGapBac-d						-0.7797*** (0.1184)
TechGapFor-d						3.5215*** (0.6018)
TechGap						-0.8419*** (0.1648)
_cons	1.6349 (0.8765)	0.3101 (0.4343)	-0.4944 (0.3432)	4.8658*** (0.5211)	0.5349 (0.4289)	2.1315*** (0.4173)
N r2_a F	675 0.3514 74.2176	424 0.4375 98.5135	424 0.4943 -	65 0.1812 -	333 0.5116 -	419 0.5560 -

Standard errors in parentheses
* p<0.05, ** p<0.01, *** p<0.001

ANNEX II: PUBLIC PRIVATE PARTNERSHIP

1. WHAT ARE PPPs?

PPPs may be defined as partnerships between the public and private sectors to design, plan, finance, construct and/or operate projects usually provided by the Government. Traditionally, the public sector has tended to engage the private sector merely to construct facilities or supply equipment. Public agencies then own and operate the facilities or equipment or engage separate maintenance and operations companies to operate the facilities and equipment to deliver the services. PPPs are an alternative form of procurement and route of delivery that allow the public sector to focus on acquiring services in the most cost-effective way, rather than directly owning and operating assets. Examples of PPP include the development of large-scale economic infrastructure (e.g. roads), amenities (water and other utilities) or social infrastructure (schools, hospitals and sports facilities).

PPPs allow the Government to focus its resources on its fundamental role of making policies to achieve efficiency and equity, while at the same time capitalizing on private sector expertise. In a PPP, the Government's responsibility is to define the scope of business by specifying priorities, targets and outputs, as well as setting the regulation regime to ensure safety, quality and performance. For example, under a PPP arrangement, a hospital building could be financed and constructed by a private developer and then leased to the Government's health ministry. The private developer then acts as landlord, providing housekeeping and other non-medical services, while the Government continues to formulate health policies and provide equitable medical services.

2. WHAT CAN PPPs ACHIEVE?

PPPs can achieve greater efficiency and cost-effectiveness in the delivery of public services. PPPs can provide greater value for money than traditional outsourcing. Rather than contracting services separately, PPPs integrate the different processes upfront, which can potentially reap economies of scale, reduce lifecycle costs and improve design. As the private consortium usually has to finance, build and maintain a project for a long period, it has stronger incentives to ensure the project is completed on time and is designed well to minimize operational costs.

PPPs enable efficient risk sharing, by allowing risk to be allocated to the partner with the greatest incentive and ability to manage it at the lowest cost. This reduces potential moral hazard problems. Given the different forms of risk involved in large-scale projects, evaluating each partner's risk management capacities accurately will affect the choice of PPP model, as well as the likelihood of the project's success or failure.

3. POTENTIAL PITFALLS OF PPPs

Countries, even those considered to be the world's most advanced and sophisticated PPP users such as the UK and Australia, still face challenges to implementing PPPs successfully. For example, although recent surveys from the UK's National Audit Office concluded that UK PPPs have generally offered good value for money, in areas closely linked to the Government's core competencies, such as clinical services and education, PPPs tended to fair less well. Almost one-quarter of public sector organizations with investments in Private Finance Initiatives (the main type of PPP in the UK) believe they are getting less value for money, partly because of high prices for additional services. Moreover, PPPs entail high governance and transaction costs.

Two important elements that affect the success of PPPs are the contractual and accounting framework and the performance management framework. The contractual and accounting framework should be standardized to reduce transaction time and costs, and hence improve efficiency, transparency and accountability. At the same time, specification and standardization should be balanced with sufficient flexibility to promote innovation and

improvement. The performance management framework should clearly identify measurable outputs and outcomes and monitor performance. This may be challenging in sectors such as healthcare and education in which key performance indicators are harder to identify and monitor.

4. EXAMPLES OF SUCCESSFUL PPPs IN SINGAPORE AND OTHER COUNTRIES

4.1. Singapore

Singapore Sports Hub (Singapore Sports Council)

The Singapore Sports Hub is the largest sports infrastructure PPP in the world. It is Singapore's flagship PPP project with a 35 hectare site that has catered to both sports and non-sports enthusiasts over the past 25 years. The deal was awarded to Singapore Sports Hub Consortium (SSHC), led by Dragages Singapore Pte under the Design, Build, Finance and Operate (DBFO) model. It achieved Financial Close in August 2010, and was expected to be ready by April 2014.

ITE College West (Institute of Technical Education)

ITE College West is the first social infrastructure PPP project in Singapore. It was awarded to Gamon Capital in November 2007 on a Design, Build, Finance and Operate (DBFO) PPP model. The contract involves designing, building, maintaining and operating the education facility for a period of 27 years.

It officially opened in July 2010.

Tuas Desalination Plant - Public Utilities Board (PUB)

The Tuas Desalination Plant is PUB's pioneering PPP project. It was designed, built and is operated by SingSpring (Pte) Ltd. The PPP was awarded on a Design, Build, Own and Operate (DBOO) model in January 2003. SingSpring is contracted to deliver 30 million gallons of desalinated water per day over the next 20 years. By leaving the choice of desalination technology to the private sector under the PPP approach, PUB was able to purchase desalinated water at a price that is among the lowest available, based on published information for overseas projects. It officially opened in September 2005.

Incineration Plant - National Environment Agency (NEA)

The NEA awarded a PPP contract for Singapore's fifth incineration plant to Keppel Seghers Engineering Singapore Pte Ltd (KSES) in November 2005. Under the PPP, KSES would design, build, own and operate the incineration plant for a period of 25 years. The move to open up the incineration industry to the private sector is in line with NEA's aim of becoming more pro-business and service-oriented by leveraging the strengths of both the public and private sectors.

4.2. Other countries

The UK pioneered PPPs in the 1990s. Partnerships UK, a dedicated unit to champion PPPs, was established in 2000 to help develop the Government's PPP policies and support PPP projects. Government departments also set up units to manage their PPPs, engage the private sector and develop guidelines for each sector. Since 2009, 567 PPP projects are in operation with the asset fully constructed, including schools, waste treatment centres and social housing projects. Examples of successful PPPs include building roads under the Design, Build, Finance and Operate Roads Contracts and the National Savings and Investments deal with Siemens Business Services.

Table A6: Models of PPPs

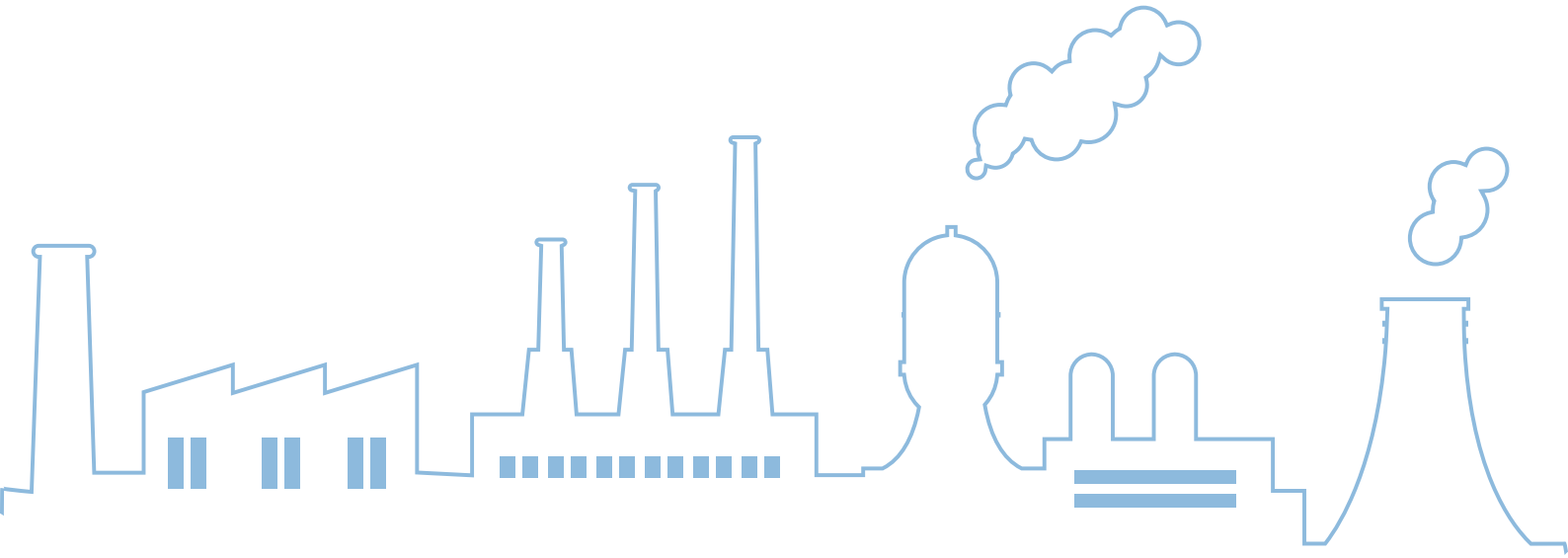
	Greater public responsibility ⟷ Greater private responsibility			
Who is in charge of the following tasks?	Design-Bid-Build (DBB)	Design-Bid (DB)	Design-Bid-Finance-Operate (DBFO)	Design-Build-Own-Operate (DBOO)
Design and construction	Government works with a team of consultants to design the facility. A contractor is then sought to build it as designed.	Government hires a contractor to design and build the facility to meet public performance specifications using a competitive tendering process, typically at fixed cost.		Private sector
Finance	Government, through tax revenue, debt financing, bonds etc.		Private sector, possibly with some public subsidy	Private sector
Operations	Typically government employees, but can also be contracted out to private firms.		Facility is leased and operated by the private sector over a period of 25 to 50 years.	Private sector
Ownership	Government		Typically government	Private sector in perpetuity
Return on investment	Government through user fees, but such facilities usually operate at a financial loss.		private sector through user fees and/or fixed government payments over the life of the operating contract.	Private sector owner through user fees and possibly public subsidies.
User fees/toll rates	Government			Private sector owner, subject to regulation.
Performance specifications	Government			Private sector

Source: *https://www.cscollege.gov.sg/Knowledge/Documents/EP042010_Annex%201.pdf*
http://app.mof.gov.sg/data/cmsresource/ppp/PPPHandbook2012.pdf
http://app.mof.gov.sg/ppp.aspx
https://www.cscollege.gov.sg/Knowledge/Pages/Can-Public-Private-Partnerships-Deliver-Better-Public-Services.aspx
http://www.nao.org.uk/wp-content/uploads/2009/11/HL_Private_Finance_Projects.pdf

ANNEX III: SUMMARY OF MAIN INCENTIVES OF SINGAPORE IN ATTRACTING FDI

Scheme	Eligibility	Incentives
Approved Foreign Loan Scheme	Minimum loan of S$200,000 from a foreign lender to purchase productive equipment	Complete or partial exemption from withholding tax on interest payable to the lender
Approved Royalties Incentive	Payment of royalties to a foreign partner	Complete or partial exemption from withholding tax on royalties
Development and Expansion Incentive	Companies undertaking new projects or expanding existing projects that provide significant economic gains to Singapore	Concessional tax rate of 5 to 15 percent for qualifying income streams
Double deduction for R&D expenditure	Manufacturing and services firms engaged in R&D	Double deduction for qualifying R&D expenses against income
Investment Allowance Incentive	Proposed investment to be made within a qualifying period of not more than 5 years	Exemption on a specified proportion of expenditure of new fixed investment in productive investment
International Headquarters	Companies providing management and other approved headquarters-related services to subsidiary, associated companies in other countries	Concessional tax rate on income from providing qualifying HQ services to approved network companies
Pioneer Status	New manufacturing and service investments introducing skills substantially more advanced than the average industry level	Exemption from corporate income tax on qualifying profits for up to 10 years
Regional Headquarters	Companies providing management and other approved headquarters-related services to subsidiary, associated companies on a regional scale	Concessional tax rate of 15 percent on income from providing qualifying HQ services to approved companies for 3 years
R&D and IP management hub scheme	Companies engaged in R&D and/or intellectual property management activities from Singapore	Exemption for a period of 5 financial years on foreign-sourced royalties or foreign-sourced interest remitted to Singapore to be spent on R&D
Tax concessions on royalty income from approved inventions and innovations	Royalty income arising from an approved invention or approved innovations	Royalty income will be taxed (at 10 percent) on 10 percent of gross royalty or net royalty income (after deductions), whichever is lower
Technopreneur investment incentive	Companies who invest in qualifying Singapore-based technopreneurial start-up activity	An investor in an approved company can deduct losses incurred from selling shares in the approved company against his/her own taxable income
Venture capital fund incentive	Venture funds with activities in Singapore	Complete or partial corporate tax exemption, for a set period, on income from divestment of shares, foreign dividend and foreign interest income
Writing-down allowance for acquisition of know-how	Companies engaged in intellectual property management activities in Singapore	Allows amortization of acquisition costs over 5 years for tax purposes
Writing-down allowance for cost sharing agreement	Companies that have signed cost-sharing agreement to cost-share the expenses on R&D	Allows amortization over 1 to 5 years of cost sharing payments to R&D, which could otherwise not to be deductible

Source: Economic Development Broad, Singapore



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Pasteur Street, Boeung Keng Kang
P. O. Box 877, Phnom Penh, Cambodia
Tel : (855) 23 216 167 or 214 371
Fax : (855) 23 216 257 or 721 042
E-mail : registry.kh@undp.org
www.kh.undp.org

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