The Role of Foreign Direct Investment in Cambodia's Industrial Development[1]

Introduction

Cambodia's economic growth has continued at a robust pace since the country opened its doors to the global economy in the mid-1990s. At 38 percent, the share of agriculture to total GDP remained substantial during 1995-2010, while that of industry edged up to 23 percent. Despite promising industrial sector growth of 16 percent over the last 18 years (MOP 2010), low income and domestic savings and limited infrastructure have hindered the country's industrial development. Foreign direct investment (FDI) plays a vital role in mobilising capital inflow to developing and credit-constrained economies. In addition, it brings new technology, stimulates innovation, transfers skills and knowledge, and builds local capacity. FDI also has tremendous influence on benefits from greater integration in regional and international communities (Olayiwola and Okodua n.d.). An important facet of FDI is its ability to accumulate human capital and technological know-how, which are key enabling factors for the long-term economic growth of recipient countries. Although necessary, FDI alone is insufficient for economic growth. Indeed, the effects of FDI are conditional on the source of inflows, sectors receiving it, stock of human capital (skills), infrastructure facilities, and the absorptive capacity of the recipient country (Blomström *et al.* 1999). Global experience shows that FDI works well in high-income countries and countries with a small technology gap.

This article draws on the findings of a study (Phann 2013) that examines the contribution of FDI inflows to outputs in eight selected industries and the industrial sector as a whole. To do so, it used time series macro data for the period 1997 to 2010 collected from the National Institute of Statistics (NIS), the Council for the Development of Cambodia (CDC), and UNCTAD. Production function based on Solow's growth model (Barro and Sala-i-Martin 2004), which included only two inputs – capital stock (K) and labour (L), was applied. Because of the short timeframe, the stationarity problem of time series analysis was ignored and simple ordinary least squares (OLS) method employed. To support the regression results, the study also briefly overviewed the experience of Thailand, Vietnam, Philippines, Bangladesh and Myanmar.

Cambodia's Industrial Sector

Spurred in the early 1990s, Cambodia's impressive industrial growth continued through to 2008-end, then slowed due to the global financial crisis later recovering to a lower yet still respectable pace. This robust growth stemmed chiefly from the garment sector driven mainly by foreign investments, especially from China. The recent phenomenon in advanced Asian economies of industries' fragmentation, as established businesses shift labour-intensive manufacturing to lower labour cost countries to maintain their global competitiveness, has possibly opened a way for Cambodia to upgrade and diversify its industrial structure (Kimura 2009 cited in Banomyong 2010). Although the country's industrial sector shows improvement, it has evolved based on low technology and labour intensive assembly industry. The major industrial

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Table 1: Shares of Industrial Sectors to Total Industrial Output (percent), 2000-2010

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2000-2010
Textiles, apparel & footwear	42.1	48.7	50.4	52.6	56.3	54.5	55.5	56.3	55.3	51.4	58.1	53.2
Construction	23.8	21.0	22.8	22.6	21.9	23.7	24.1	23.7	24.1	25.9	18.4	23.1
Food, beverages & tobacco	14.6	13.5	11.2	10.5	8.5	8.2	7.2	6.8	7.0	7.5	7.7	9.4
Other manufacturing	10.0	9.0	8.4	8.1	7.5	7.8	7.6	7.5	7.7	8.5	8.6	8.3
Electricity, gas & water	1.9	2.0	1.9	1.8	1.7	1.7	1.9	2.0	2.1	2.3	2.4	2.0
Wood, paper & publishing	4.3	2.7	2.3	1.8	1.6	1.6	1.4	1.4	1.4	1.5	1.5	2.0
Mining	1.1	1.1	1.2	1.2	1.3	1.5	1.4	1.4	1.6	2.0	2.4	1.5
Rubber manufacturing	2.2	2.0	1.7	1.4	1.1	0.9	0.8	0.8	0.8	0.9	1.0	1.2

Source: National Institute of Statistics (unpublished data 2000-2010)

Table 2: Cumulative Industrial Foreign Fixed Asset Investment Approvals by Sector and Investing Country (USD million), 1995-2010

Top 15 countries (in USD m)	Textiles, apparel & footwear	Mining	Wood, paper & publishing	Food, beverages & tobacco	Construction	Rubber manufacturing	Electricity, gas & water	Other manufacturing	1995-2010
Mainland China	450.5	574.5	84.0	130.0	6.1	196.1	1211.7	305.7	2958.6
Taiwan	350.7	10.0	97.3	89.9	4.2		50.0	65.0	667.1
Korea	116.0	4.3	25.8	17.2	172.5	79.0	3.2	94.8	512.8
Thailand	16.5	2.5	22.1	365.4	46.5		25.4	18.0	496.4
Malaysia	63.1		236.2	27.6	2.7	31.7	64.8	59.0	485.1
Vietnam	1.6	0.4		25.1	3.3	276.8	2.8	74.7	384.7
Singapore	57.2		11.0	79.1	1.6	41.4	16.5	12.6	219.4
Hong Kong	108.0		62.5	10.1	4.3			25.3	210.2
United States	34.3	1.3	20.4	1.4		28.5	8.7	53.4	148.0
Canada	20.5	2.5		4.3	39.5			13.7	80.5
United Kingdom	68.4		0.1	13.5				2.3	84.3
India							75.0	0.3	75.3
Japan	7.1			31.5	2.8			15.2	56.6
Australia	12.9	4.3	5.3	15.8			0.3	2.3	40.9
Belgium								35.0	35.0
Total countries	1337.9	605.0	604.4	825.9	290.2	653.5	1459.3	794.6	6570.8

Source: Council for Development of Cambodia (unpublished data 1995-2010)

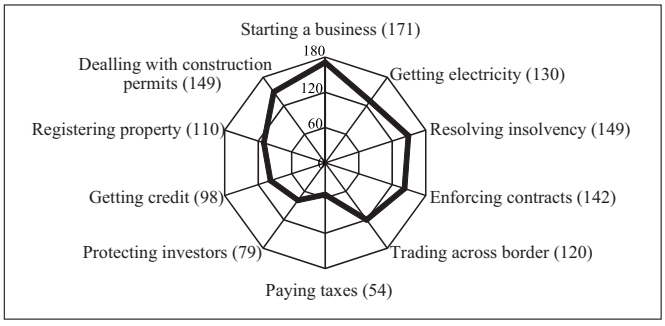
sectors include mining; food, beverages and tobacco; textiles, wearing apparel and footwear; wood, paper and publishing; rubber manufacturing; electricity, gas and water; construction; and other manufacturing (Table 1).

FDI Inflows in Industry

Cambodia's low domestic savings rate (16 percent of GDP during 2000-2010) and corresponding shortfall in domestic investment capital underscore the need to attract FDI. Besides financial support, FDI brings other productive assets and knowledge that can advance economic development. FDI inflow in Cambodia has been determined by external factors such as shocks in FDI-sending countries and favourable terms in international markets rather than by domestic factors such as cheap labour and raw materials. By 2010 FDI inflows had increased to 5.3 percent of GDP from 3.8 percent in the 1990s and a mere 0.02 percent in the 1970s (UNCTAD). On average, in 2000-10 the biggest FDI inflow at 50 percent of total investment approvals went to the service sector while 49 percent went to the industrial sector. Table 2 shows Cambodia's FDI inflows to the eight main industrial sub-sectors from the top 15 investing countries.

Apart from the special privileges afforded the country's textiles, apparel and footwear sector, there are no focal factors that locationally bind foreign investments to Cambodia by being tied to certain activities. Despite the attractiveness of the country's abundant low wage labour, the relatively high costs of setting up and doing business deter FDI. Using Doing Business indicators complied by the World Bank and the International Finance Corporation (IFC), Figure 1 illustrates Cambodia's ranking among 183 economies.

Figure 1: Cambodia's 'Doing Business' Ranking, 2012



Source: World Bank and IFC (2012), Doing Business

Effects of FDI on the Industrial Sector: Empirical Framework

The contribution of FDI to Cambodia's industrial sector was analysed using the Cobb-Douglas production function (Barro and Sala-i-Martin 2004), which describes the variation in output affected by the inputs capital and labour in a production process. This is captured by applying the below production function to different industrial sectors identified by *i* at time *t*:

$$Y=F(K, L) \quad (1)$$

where Y is real output of each industrial sector, K is physical capital and L is labour. K is defined by the sum of domestic capital stock (K_d) and foreign capital stock (K_f), which can be written as $K_{total}=K_d+K_f$. The regression equation then assumes the following linear form:

$$logGDP_{it}=b_{oi}+b_{ii}logK_{dii(t-1)}+b_{2i}logK_{fi(t-1)}+b_{2i}logK_{fi(t-1)}+b_{3i}logL_{it}+u_{it} \quad (2)$$

$$logGDP\_food_t = b_{0food} + b_{1food}logDomK\_food_{t-1} + b_{2food}logFDIK\_food_{t-1} + b_{3food}logLabor\_food_t + u_{foodt} \quad (2.1)$$

$$logGDP\_textiles_t = b_{0textiles} + b_{1textiles}logDomK\_textiles_{t-1} + b_{2textiles}logFDIK\_textiles_{t-1} + b_{3textiles}logLabor\_textiles_t + u_{textilest} \quad (2.2)$$

$$logGDP\_rubber_t = b_{0rubber} + b_{1rubber}logDomK\_rubber_{t-1} + b_{2rubber}logFDIK\_rubber_{t-1} + b_{3rubber}logLabor\_rubber_t + u_{rubbert} \quad (2.3)$$

$$logGDP\_mining_t = b_{0mining} + b_{1mining}logDomK\_mining_{t-1} + b_{2mining}logFDIK\_mining_{t-1} + b_{3mining}logLabor\_mining_t + u_{miningt} \quad (2.4)$$

$$logGDP\_utility_t = b_{0utility} + b_{1utility}logDomK\_utility_{t-1} + b_{2utility}logFDIK\_utility_{t-1} + b_{3utility}logLabor\_utility_t + u_{utilityt} \quad (2.5)$$

$$logGDP\_wood_t = b_{0wood} + b_{1wood}logDomK\_wood_{t-1} + b_{2wood}logFDIK\_wood_{t-1} + b_{3wood}logLabor\_wood_t + u_{woodt} \quad (2.6)$$

$$logGDP\_construc_t = b_{0construc} + b_{1construc}logDomK\_construc_{t-1} + b_{2construc}logFDIK\_construc_{t-1} + b_{3construc}logLabor\_construc_t + u_{construct} \quad (2.7)$$

$$logGDP\_othermanu_t = b_{0othermanu} + b_{1othermanu}logDomK\_othermanu_{t-1} + b_{2othermanu}logFDIK\_othermanu_{t-1} + b_{3othermanu}logLabor\_othermanu_t + u_{othermanut} \quad (2.8)$$

$$logGDP\_indus_t = b_{0indus} + b_{1indus}logDomK\_indus_{t-1} + b_{2indus}logFDIK\_indus_{t-1} + b_{3indus}logLabor\_indus_t + u_{indust} \quad (2.9)$$

where GDP_{it} = the outputs of each industrial sector i at time t; b_{0i}, b_{1i}, b_{2i} and b_{3i} are the intercept terms and coefficients of each variable; u_{it} is a term of residual of i sectors (i=1, 2, 3… 9 representing the eight selected industrial sub-sectors and the overall industrial sector); and K_{di}=DomK and K_{fi}=FDIK, which denote domestic and foreign capital stocks of industrial i.

To allow for delayed returns to capital outlay, as it may take enterprises some time to order and install capital assets such as machinery and equipment prior to operating, the study takes one lag of K_{di} and K_{fi} calculated using the perpetual inventory method. Then, $K_{(t+1)}$= (1-d) * K_t + I_{t+1} where $K_{(t+1)}$ and K_t are the capital stock in time (t+1); t. d is the depreciation rate of capital, which is set at 5.0 percent for Cambodia (see Net 2011); and I_{t+1} is the fixed assets investment inflow at time (t+1). The fixed assets investment shared by Cambodia is represented by $I_{d(t+1)}$, while the share of foreign nationality is written as $I_{f(t+1)}$. This study takes K_{1995} as the initial capital stock for both domestic and foreign capital stocks for each selected industrial sector. Based on the assumption that the rate of capital-output ratio was constant during the 1990s, it then calculates K_{1995}= $I_{1995}/(g_{1995}+d)$ following Harberger (1978), where g_{1990s} is the average growth rate of capital, which is equal to the growth rate of outputs (GDP) during the 1990s, and L_i is employment in sector i.

Results

The econometric estimation of capital inputs found that FDI has beneficial impact on four industrial sectors: food, beverages and tobacco; textiles, apparel and footwear; utilities; and other manufacturing. However, FDI is still in the diminishing returns to scale stage (see Table 3), indicating the ineffective use of capital and the need for productivity improvement. Cambodia has not yet achieved economy of scale. Findings also reveal that FDI has a statistically insignificant effect on overall outputs at aggregate industrial level. The different effects of FDI on industrial sectors are possibly caused by the nature of FDI itself, sector-specific economic characteristics and infrastructure, and regulatory barriers and bureaucracy (Lean 2008). However, all models were found to be hugely trended when the time variable was included (meaning they were affected by time rather than the nature of the data). Therefore, the short time series as well as poor data quality and accuracy problems could invalidate the results.

Lessons for Cambodia from the Experience of Selected Countries

Cambodia's industrial structure is similar to that of Vietnam, Bangladesh and Myanmar. Textiles, apparel and footwear and to some extent food,

Table 3: Ordinary Least Squares Results of Equation (2)

Dependent variable: LogGDP(t)_i Method: Ordinary Least Squares Sample: 1997, 2010 Included observations: 14				
	Constant	Coef. logDomK (t-1)_i	Coef. logFDIK (t-1)_i	Coef. logLabor(t)_i
(2.1) logGDP(t)_food	4.415***	-0.045	0.192***	-0.023
(2.2) logGDP(t)_textiles	2.330**	-0.557	1.612**	-0.213
(2.3) logGDP(t)_rubber	3.113***	-0.002	0.038	-0.049
(2.4) logGDP(t)_mining	-0.629	0.291	0.019	0.319***
(2.5) logGDP(t)_utilities	2.291***	0.164***	0.205**	-0.035
(2.6) logGDP(t)_wood	6.537***	-0.330	-0.014	-0.194**
(2.7) logGDP(t)_construc	0.253	0.594**	-0.345	0.330***
(2.8) logGDP(t)_othermanu	2.973***	-0.079	0.493***	-0.025
(2.9) logGDP(t)_indus	0.138	1.542**	-0.600	0.137

Note: * 10 percent, ** 5 percent and *** 1 percent level of significance. Source: Author's calculation.

beverages and tobacco remain the dominant sub-sectors, which benefit from the ample low wage labour force. Textiles, apparel and footwear manufacturing relies heavily on importing and assembling intermediate inputs. This means that in the event of adverse conditions or the expiration of privileges, investments in this sector can readily leave the country. Diversification of the food-processing sub-sector is a focus of the government's industrial policy, yet it remains immature due to narrow product variety and poor quality standards.

Given that Cambodia is unable to invest in heavy industrial facilities and high technology in the short run, it has to sustain its current labour-intensive industries. Therefore, industrial development policy at this stage would do better to emphasise agricultural linkages and labour-intensive manufacturing. This is crucial if the country is to establish economies of scale and develop high technology industries that in turn would enable the country to accumulate human and physical capital and increased productivity for a long-term resilient industrialisation process. To enhance its growth prospects, the country must also learn to choose sources of investment wisely to build its competitiveness, drive innovation and reduce poverty.

Conclusion

Based on econometric results and case study analysis, the two subsectors most likely to attract investments are food, beverages and tobacco and textiles, apparel and footwear. Cambodia needs to prepare itself to lure high technology investments to compete against emerging competitors like Myanmar, and to confront possible higher wage rates in the future. A first step would be to determine the potential industrial sub-sectors and zones that should be prioritised in its policy strategy. Further, the country needs to learn how to create and manage the necessary pre-conditions for industrial support sectors. Choosing the right policy mix is critical for the country's industrial development, especially given its limited productive resources.

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Continued on page 14