

# Are Foreign Workers Contributing to Growth of the Construction Sector in Mauritius?

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**Abstract—** This paper examines the role and contribution of foreign labor in construction sector for the economic growth of Mauritius. The number of foreign workers in Mauritius is constantly increasing, especially in construction industry. More number of foreign laborers's attracted, especially from India, Bangladesh, Sri Lanka, and china. This study examines the role of construction foreign workers in shaping the Mauritian economy, especially the construction sector. For the purpose of this study, Cobb-Douglas model is applied using time-series data for the period 1990-2015. The results shows, there is a positive relationship between the growth rate and the foreign construction labour in Mauritius.

**Keywords-** Construction; GDP; Foreign Workers; Cobb-Douglas;

## I. INTRODUCTION

Since independence in 1968, Mauritius has undergone a remarkable economic transformation from a low-income, agriculturally based economy to a diversified, upper middle-income economy with growing industrial, financial, and tourist sectors. Mauritius has achieved steady growth over the last several decades, resulting in more equitable income distribution, increased life expectancy, lowered infant mortality, and a much-improved infrastructure. The government's development strategy centers on creating vertical and horizontal clusters of development in these sectors. Mauritius has attracted more than 32,000 offshore entities, many aimed at commerce in India, South Africa, and China. Investment in the banking sector alone has reached over \$1 billion.

Mauritius sound economic policies and prudent banking practices helped to mitigate negative effects of the global financial crisis in 2008-09. GDP grew in the 3-4% per year range in 2010-14, and the country continues to expand its trade and investment outreach around the globe. Growth in the US and Europe fostered goods and services exports, including tourism, while lower oil prices kept inflation low in 2015. The

construction sector has been an important sector both in terms of its contribution to the GDP and employment created. Yet no direct research on the importance of this sector to the economy or the productivity of this Sector has been undertaken. In Mauritius, the overriding objective has been "employment creation" since the 1960s as unemployment had reached unacceptable levels by 1965. With the focus on employment creation, the development of the Construction sector has been based primarily on providing the basic infrastructure required to attract investors to the "productive" sectors such as Manufacturing or Agriculture. Unexpectedly however, Mauritius has had to depend increasingly on Foreign labour for its main productive sectors. The two sectors with the highest percentage of foreign labour have been manufacturing and construction. The construction sector has accounted for around 6 % of total GDP as from 1990. It declined to around 3.9 % of total GDP in 2015. The highest reached has been 6.6 % in 2011[Mauritius Economy Profile 2016].

TABLE I: % DISTRIBUTION OF GDP BY MAIN INDUSTRY GROUPS

	2011	2012	2013	2014	2015
<b>Manufacturing</b>	<b>16.9</b>	<b>16.7</b>	<b>17.0</b>	<b>16.5</b>	<b>16.3</b>
Sugar	0.4	0.4	0.3	0.2	0.2
Food exc Sugar	6.0	6.6	6.5	6.1	6.0
Textiles	5.1	4.9	4.9	4.9	5.0
<b>Construction</b>	<b>6.6</b>	<b>6.3</b>	<b>5.5</b>	<b>4.8</b>	<b>4.4</b>
<b>Wholesale &amp; retail trade; repair of motor vehicles and motorcycles</b>	<b>11.8</b>	<b>12.2</b>	<b>12.3</b>	<b>12.5</b>	<b>12.6</b>
of which Wholesale and retail trade	10.9	11.2	11.3	11.5	11.5
<b>Financial and insurance activities</b>	<b>10.2</b>	<b>10.3</b>	<b>10.2</b>	<b>10.3</b>	<b>10.3</b>
<b>GDP/Gross Value Added at basic prices</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: Statistics Mauritius, National Accounts, 2006-15.

The construction sector has witnessed among the highest growth rates in the Mauritian economy and contribution to

GDP has been drastically showing positive impact from past 20 years. Latest national account figures released by Statistics Mauritius estimate the GDP growth rate for 2015 to be at 3.9%. The forecasted growth rate is an improvement over the 3.4 percent expansion in the Mauritian economy last year. Even as foreign workers in Mauritius are poised to overshoot 40,000 by year end, representing a whopping 20% increase over 2008, a debate rages over whether these skilled workers are a boon to the economy or a bane to local workers' employment prospects. In this context, the NESC pointed out the "*paradox that even with thousands of low skilled youth unemployed, employers report that several sectors, notably construction, textile, trade and services sector in particular are crippled by labour shortages and are forced to turn to foreign labour.*" It is quite interesting to explore in such debatable situation, to understand the reality of the role played by the foreign construction workers for economic growth of the country [Mauritius Economy Profile 201].

## II. LITERATURE REVIEW

Foreign labour has been the central factor in socio economic development of most of the countries across the globe. It is vided as a great temptation in Mauritius for hiring a foreign labour, specially the construction sector. Hiring the foreign workers happens to be a special unit within the Ministry of Labour, Industrial Relations and Employment and the other of an agency under the Ministry of Finance and Economic Development, or the Board of Investment (BoI).

Is it possible to replace foreigners by Mauritians? The question is whether these criteria are adhered to. Studies show that Mauritians have always the notion of "pain area" of the 70s compared to the industrial free zone and that, moreover, Mauritian workers are not as skilled as you might think, especially when compared workers with Indian, Bangladeshi or Chinese (Industrial Relations and Employment Agency). Some employers have a tendency to circumvent these requirements, see and do in the foreign labor, a possibility to employ staff willing to work for lower wages and longer hours and unwarranted. It lies in these cases the inspectorate of the Ministry of Labour to monitor the abuse of working conditions and the Inspectorate of Health and Safety Department of the same Ministry regarding these other aspects. Denis, director of a private company, estimates that the foreign worker it is more expensive than its counterpart in Mauritius. "The steps are expensive. Each month there is a food allowance of Rs 1200, shelter, insurance considerations. It is relatively more expensive to maintain and pay the monthly salary of a Mauritian. The advantage in all this is that they work quickly and are very effective. They have no family life and not be absent. "For the director," just follow all laws regarding workers and exploitation in these cases would not exist. "

A review on modified Solow growth model determines the effects of migration on the economic growth of the host country are insignificant (Friedberg and Hunt (1995). According to Zimmermann (1995), the immigration creates extra demand for goods and services and creates positive affect on output growth. As calibrated by three-sector general equilibrium model of Drinkwater *et al* ,2007 and Borjas, 1995, with endogenous growth to European Union

economies, and redefined immigration surplus in terms of the increase in welfare levels among the natives in the post-immigration era. According to them, that unskilled immigrants have a negative impact on the size of immigration surplus and support the immigration policies that favour skilled immigrants. The comparative study done by Borjas Rahmah *et al.* in 2003, reveals, the impact of foreign labour on output growth and the demand for foreign labour in the Malaysian manufacturing sector by the professional foreign labour contributes significantly to manufacturing output growth and professional foreign labour and local labour are complementary, while the unskilled foreign labour and local labour are substitutes.

The migrants tend to go where labour demand is buoyant, filling gaps in the labour market and subsequently contributing to the output of the economy and it is beneficial to the economy (Portes and French (2005). Studies shows on also tend to suggest that West Midlands economy in the UK, contributing to 5% of the regional output (Green *et al.* 2007). Christofides *et al.* (2007) study foreign labour in Cyprus using time series data from the period of 1996 until 2006, says, Cyprus experienced tremendous economic growth during that period, which subsequently resulted in a labour shortage. The country was required to rely upon foreign labour to sustain its economic activities. The study suggests that the positive effect from employing foreign labour depends on the education level and skills of the foreign labours. Highly educated and skilled foreign labours have a positive impact on the economic growth in Cyprus, whereas less educated and unskilled foreign labours have a negative impact.

Ajis (2010) studies the historical phenomenon of foreign workers - the contract labour system - in Southeast Asia countries such as Indonesia, Philippine, Malaysia, Thailand and Singapore and details the various economic and administrative structures set up by the importing countries to administer the system. He points out that the contribution of Foreign workers is not only "to give an impact to importer country economy development but also give a huge contribution to their home country economic welfare. " He refers to the works of Goss and Linquist (1995) who propose the phenomena of arises from the natural human nature to maximise their income and hence "unequal payment and economic development in regional countries will stimulate and enhance the migration of labour to another country in the region". Other similar works are the *Wage differential theory* of Hicks (1932) which motivate migration, which is also reflected by Harris & Todaro (1970) in the differential salary and job opportunities, Davanzo (1981) and Amin (1974) who stated that "migration can be considered as a transmission of existing positive values—" as migrated workers possessed higher productivity and education from developing countries which could influence the working environment and strengthen economic development of the importing country.

The presence of foreign labour in Gulf Cooperation Council (GCC) countries results in a stagnant growth rate of the per capita income because the majority of the labours are unskilled. Tangavelu (2012) examines the role of foreign labour in

Singapore and found that foreign labours have a positive effect on economic growth and the effect depends on the types of economic activities in which foreign labours are utilized. The positive effect of foreign labour on the economic growth of Singapore can be associated with the level of skills possessed by foreign labours. The majority of foreign labours that enter Singapore are skilled labours because the presence of strict regulations regarding foreign labour makes it difficult for unskilled labourers to enter Singapore.

### III. DATA AND METHODOLOGY

The dataset has been compiled from the Central Statistical Office of Mauritius (various reports) from 1990-2015. For this purpose, Cobb-Douglas model is applied. The main data for running the model is described in Table I. Initially for visual inspection of the statistics, we can make use of box-and-whisker plots (Turkey, 1970). These plots will provide a convenient and compact picture of the general shape of the distribution. Box and Whiskers plots are used for the pictorial presentation of the results. Box and Whiskers graphs are a simple, linear way to analyze sets of continuous numerical data. They are especially helpful in determining whether or not there are significant differences between sets of data and convey useful visual information about the centre, spread, symmetry, and outliers at a glance and allow us to draw informal conclusions when two or more variables are present. Box-plots are also called five-number summary plots since they consist of the median, the quartiles (lower and upper), the smallest and largest values in the distribution. A Cobb-Douglas model is applied to determine the contribution of foreign employment. Time-series model is employed for this purpose.

### IV. RESULTS

This paper uses an econometric framework by the specifying a Cobb-Douglas production function as follows:

$$Q_t = A_t K_t^{\beta_1} L_t^{\beta_2} F_t^{\beta_3} U_t \quad (1)$$

where  $Q$  is contribution to growth,  $A$  is state of technology,  $K$  is capital stock,  $L$  is labour,  $F$  is foreign labour and  $U$  is an error term,  $t$  is time. Equation 1 can be transformed into linear form by taking the natural logarithmic on both sides. The respective coefficients can then represent the output elasticity with respect to each dependent variable.

$$q_t = a_t + \beta_1 k_t + \beta_2 l_t + \beta_3 f_t + u_t \quad (2)$$

The small letters denotes that the variables are in natural logarithmic terms. The dependent variable, contribution of foreign construction labour for the growth has been measured by GDP (constant 2006). The physical output  $k$  has been proxied by the investment to GDP ratio (27) and we use labour force to capture the effect of  $L$ . The three variables have been made available from the World Development Indicators while

variable  $e$  is the BOR as compiled by the GEM (29). The descriptive statistics is given in Table 1.

TABLE II: SUMMARY STATISTICS

Variable	Mean	Std. Dev.	Maximum	Minimum
$q$	16.089	0.3069	16.579	15.6105
$k$	155.6112	6.1442	163.966	136.4142
$l$	10.6749	0.1191	10.7851	10.7851
$f$	7.03181	0.8950	8.0724	5.29831

The trends for each variable are shown below:

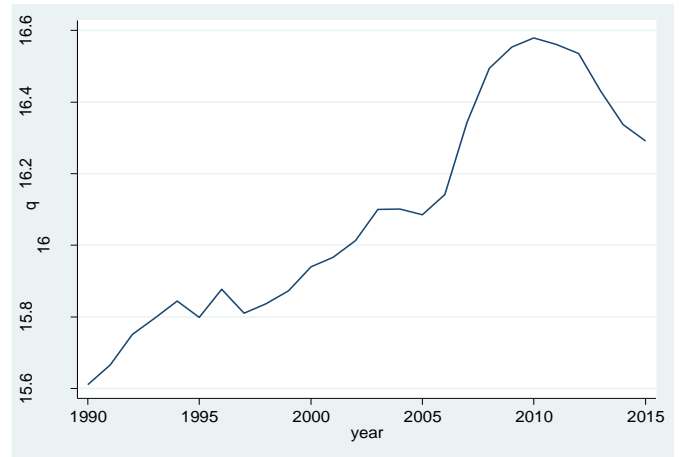


Figure 1 (a): Trends of  $q$

As shown Figure 1(a), GDP by the construction section has increased steadily from 1990-2009 before experiencing a fall.

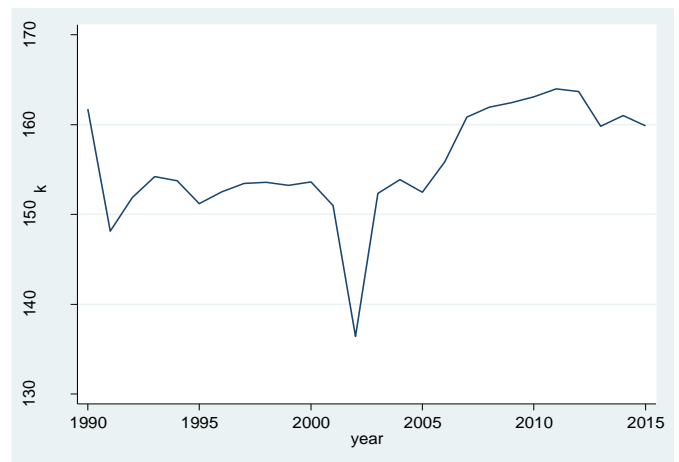


Figure 1 (b): Trends of  $k$

As shown Figure 1(b), capital has also been on the rise apart from the 2002 shock in the sector could be because of cyclone Dina that hit Mauritius severely.

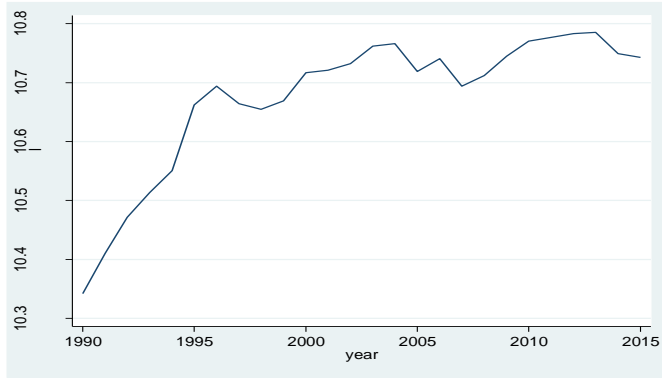


Figure 1 (c): Trends of  $l$

As illustrated Figure 1(c), the local workers employment in the construction sector has been on the rise steadily from 1990-1995. Afterwards, the employment pattern has been rather erratic.

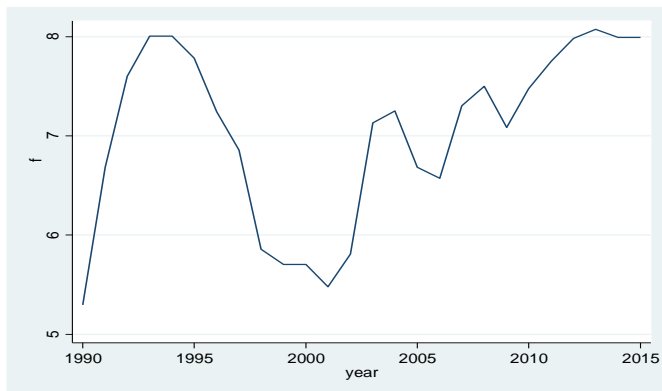


Figure 1 (d): Trends of  $f$

Figure 1(d) depicts a prominent rise in employment of foreign workers as from early 2000.

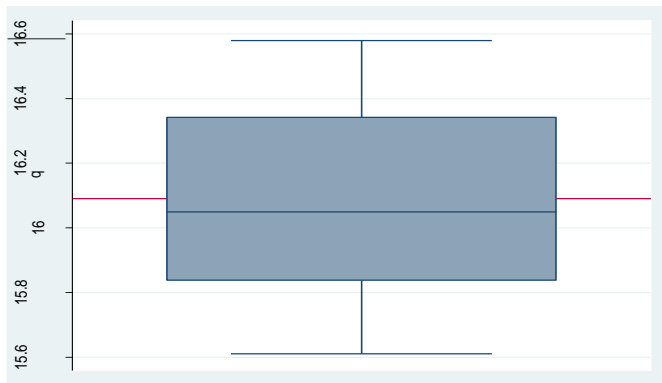


Figure 2(a): Box plot for  $q$

Following Figure 2(a), the lower (25<sup>th</sup>) percentile is 15.84 and the upper (75<sup>th</sup>) percentile is 16.34, while the median (also called 50<sup>th</sup> percentile) is 16.04 (the line which splits the box into two). The red line outside the box is the mean at 16.08.

The whiskers are those lines extending out from the ends of the above boxes. The distance between the first and third quartile is called the interquartile range (IQR) which is used to measure the spread of GDP. It is a useful measure as it is less influenced by extreme values and limits the range to the middle 50% of the values. The IQR is equal to 0.5. The lower-fence of the whisker marks the individual with the lowest spell within 1.5IQR (1.5 times the spread of GDP) from percentile 25. For instance, the lower-fence is computed to be  $[-(1.5 \times 0.5) + 16.34] = 15.59$ .

Box plot also allows us to scrutinize outliers. These are dots beyond the whiskers. Outliers are observations that fall outside the values expected, given the spread outside the whiskers. They can be defined as observations more than 1.5IQR beyond the first or third quartile. Negative outliers have values less than expected and positive outliers have values higher than expected. Outliers can be classified as either possible (mild) or probable (extreme) outliers. Possible outliers are values with records that are "possibly" unusual. Their values are between 1.5IQR and 3IQR from the end of the box. Probable outliers are values that are more extreme and unusual than those designated as possible outliers. Their values are beyond 3IQR from the ends of the box.

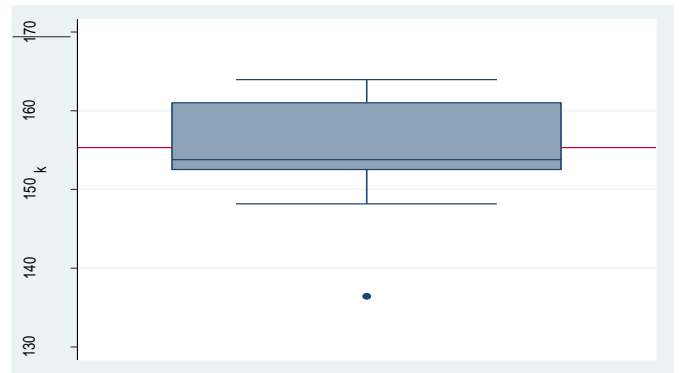


Figure 2(b): Trends of  $k$

From Figure 2(b), an outlier is found at 136.4. The IQR is 8.54 and the outlier is beyond 3IQR from the 25<sup>th</sup> quartile.

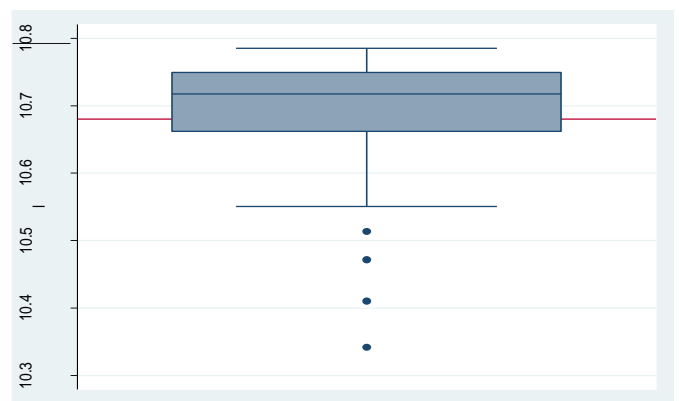


Figure 2(c): Trends of  $l$

From Figure 2(c), four outliers are identified for the variable denoting local workers.

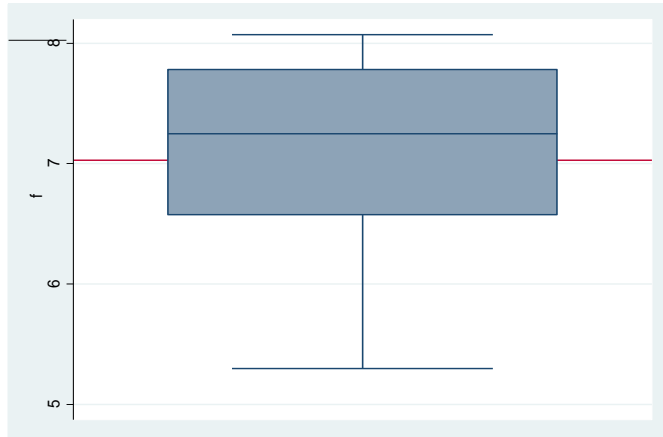


Figure 1(d): Trends of  $f$

As per Figure 2(d), the lower and upper percentiles are 6.57 and 7.78 respectively. The IQR is 1.21. No outliers are to be uncovered.

TABLE III: COBB-DOUBLAS ESTIMATES

Coefficient	Estimates
$\beta_1$	0.022987 (0.00834)**
$\beta_2$	1.611044 (0.22172)***
$\beta_3$	0.043805 (0.023647)*
$u$	-4.990211 (2.124015)**
$R^2$	0.8187
F(3,22)	49.24 [0.0000]***
Observations	26
Sector	1

Note: \*\*\*, \*\*, \* denote 1%, 5% and 10% respectively. The standard error is in brackets while P-value is in square brackets.

The results for the Cobb-Douglas are shown in Table III. The coefficients have the expected signs and are statistically significant. Foreign labour is found to contribute to the growth of the construction sector. A one-percentage rise in foreign workers is translated to a rise in GDP by the construction sector of 0.04%.

## V. CONCLUSION AND POLICY IMPLICATIONS

The relationship between the contribution for economic growth by the foreign labor is multifaceted as it encompasses other factors associated for contribution of growth. The study attempt to evaluate construction foreign labor as solitary representative variable for economic growth. For this purpose, the NESC dataset and time series data from 1990-2015

were considered, gathered and generated a final dataset for the analysis. The data on construction foreign construction labor was subjugated to inspect the proportion contribution for the economic growth of Mauritius.

The results have significant constructive policy implications for Mauritius. This is abetted and evidenced by the latest statistics released by the National Assembly Xavier-Luc Duval and Shakeel Mohamed in response to the arrests of opposition members. There are about 45,632 foreign workers in Mauritius and majority of them are from construction and manufacturing industries and 35,221 hold a work permit issued by the Ministry of Labour, Industrial Relations and Employment and 10,411 for a license pursue a particular occupation (Occupation Permit) issued by the Board of Investment. Therefore, they are the community's largest foreign workers in Mauritius with 34.5% of the workforce playing very vigorous part for the economy and growth.

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