

# A Descriptive Assessment of Foreign Labour and Labour Productivity across Economic Sectors in Malaysia

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## ABSTRACT

The purpose of this paper is to identify the sector with the highest involvement of foreign labour and to compare labour productivity across the primary, secondary, and tertiary sectors in Malaysia between 2010 and 2020 using a descriptive research design. The study comprises three sectoral models representing the primary, secondary, and tertiary sectors. Descriptive analysis, based on mean comparisons, was conducted to examine labour productivity and the level of foreign labour involvement over the study period. The findings were further discussed in relation to previous studies, and a comparative analysis was performed to explore patterns between foreign labour participation and labour productivity across sectors.

The results indicate that the secondary sector recorded the highest level of labour productivity, followed by the primary sector, while the tertiary sector exhibited the lowest labour productivity. In terms of foreign labour involvement, the secondary sector had the highest proportion of foreign workers, followed by the tertiary sector, whereas the primary sector recorded the lowest level of foreign labour participation. These findings provide useful insights for policymakers in understanding the distribution of foreign labour and labour productivity across Malaysia's economic sectors. The results may assist policymakers in identifying sectors with high foreign labour participation and formulating appropriate labour market strategies accordingly. Given the descriptive nature of this study, future research may employ econometric techniques to examine the relationship between foreign labour and labour productivity across sectors and to provide further evidence on their association within the Malaysian context.

**Keywords:** Foreign Labour, Local Labours, , Capital, Labour Productivity, Economic Sector

## INTRODUCTION

Productivity has been mentioned as the comparison of the output with the inputs used to produce it. Economic inputs are commodities within an entity that comprises human capital, finance, and so forth, whilst output is the product created from the existing input (Prokopenko, 1987). Most productivity concepts refer to the estimation of input efficiency in output production and the analysis of efficiency by detecting the actual output and the expected output ratio (Pritchard, 2002). Labour productivity can be considered as a crucial indicator of the economy. Productivity estimates the product generated by the workers in various economic sectors.

Productivity improvements define economic growth, and wage increments increase living standards, as well as reduce poverty. Therefore, an enhancement in labour productivity is the main reason for the increase in wages and thus, living conditions (Tsoku and Matarise, 2014). Polyzos and Arabatzis (2005) have demonstrated that labour productivity has a significant role in influencing the productivity of a given sector or economy as a whole and tends to establish the conditions required for economic growth. Some empirical studies, such as

Rukumnuaykit and Pholphirul (2016) on Thailand Bank, Sasso and Ritzen (2019) on 12 OECD economies and 17 industries, as well as Okumu and Mawejje (2019) on African companies, showed the positive impact of competence labour on labour productivity within sector/industry.

There have been findings from numerous earlier studies on the causes of labour productivity growth on foreign workers through comparison in different economic sectors, most of which pointed to the position of TFP and capital intensity, both in a single-country or cross-country comparison in different economic sectors. For example, using a sectoral study of comparative labour productivity trends between 1870 and 1990. Broadberry (1998) found that both Germany and the US kept up with and have overtaken Britain regarding accumulated labour productivity by reallocating resources from agriculture to services instead of on manufacturing, thus increasing its relative productivity role in service sector. Additionally, the author related changes in labour productivity to transformation in comparative TFP in terms of technological development and efficient organisation, without abandoning any of the functions of capital intensity.

However, in Malaysia, the situation of low labour productivity began when there was a sharp declined in labour productivity during the Asian financial crisis period in 1998. After the crisis, productivity growth has improved, but decelerated after the 2008 crisis. From there, the growth in labour productivity has already decreased in trend. Nevertheless, the Asian financial crisis of 1998 and the world financial crisis of 2008 had seen a decelerated labour productivity growth of Malaysia, which can be seen in Figure 1.1. The downturn in growth for productivity has been noticeable since the last three decades, and was particularly low in the current phase. Labour productivity grew by an average of 3.9% between years 1985 and 1996. Then it was continuously dropped to 3.8% for the period 2000 to 2007, 2.5% between 2011 to 2016 (Gen & Ng, 2017) and 2.2% for the period 2018 to 2019 (Department of Statistics Malaysia, 2020).



**Figure 0.1: Malaysian Labour Productivity Growth**

Source: World Development Indicators (WDI) and Department of Statistics Malaysia 2019

As seen in **Error! Reference source not found.2**, the decreased in annual labour productivity growth over the three decades was mainly due to the effect of labour productivity from each economic sector. The fall in labour productivity is not specific in certain sector. This trend occurred primarily in the most recent times between 2018 and 2019 when the measurements were taken, on the effect of the agriculture sector that fell by 6% from 2017 until 2019, whilst manufacturing and services sector declined by 1.6% and 0.7% respectively. Furthermore, these three major economic sectors consisted about 90% of all workers in the Malaysian

economy (Department of Statistics Malaysia, 2020).

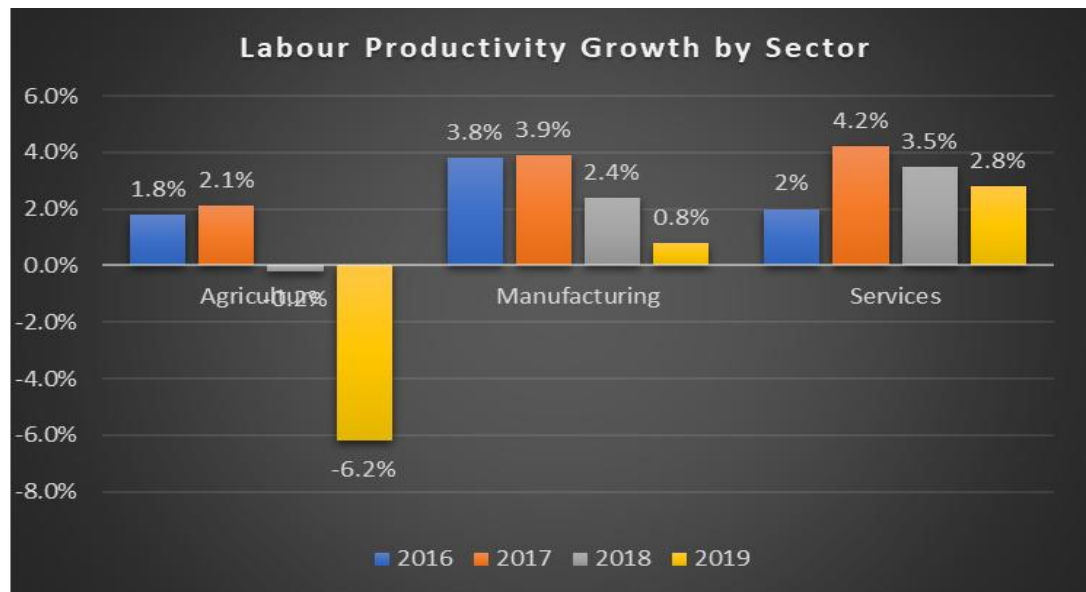


Figure 0.2: Malaysian Labour Productivity Growth

Source: Productivity growth sourced from Department of Statistics, Malaysia Productivity level computed by Malaysia Industrial Productivity Database (MIPD) Year 2019

Acknowledging this, the primary objective of this study is to examine the involvement of labour factors, namely local labour and foreign labour, together with other production inputs such as intermediate inputs, salaries, and capital, in relation to labour productivity across different economic sectors in Malaysia. The study aims to compare labour productivity patterns among sectors with varying levels of local and foreign labour participation and factor input utilization. What are the patterns and differences in labour productivity across Malaysian economic sectors based on the involvement of local labour, foreign labour, and other factor inputs?

### Scope of the Study

The scope of this study is to describe the involvement and distribution of factors associated with labour productivity, with particular focus on the utilisation of foreign workers across the primary, secondary, and tertiary sectors in Malaysia. The study employs annual panel data covering an 11-year period from 2010 to 2020. The cross-sectional dimension of the panel consists of selected industries within the three major economic sectors, namely the primary, secondary, and tertiary sectors.

The primary sector comprises industries related to agriculture, livestock, fishing, forestry, and logging. The secondary sector consists of mining and quarrying, manufacturing, and construction. The tertiary sector comprises industries including wholesale and retail trade and motor vehicle repair, accommodation and food services, and administrative and support services. The data for the analysis were obtained from the Department of Statistics Malaysia (DOSM).

The variables considered in the descriptive analysis are based on the Solow–Cobb–Douglas production framework. These variables include capital, local labour, foreign labour, intermediate inputs, wages, and labour productivity. Rather than estimating the causal effect of these factors on labour productivity, the study uses descriptive statistics, particularly sectoral mean comparisons, to describe and compare the patterns of these factors across the selected Malaysian industries.

The descriptive analysis provides an overview of differences in foreign labour utilisation, local labour, capital, intermediate inputs, wages, and labour productivity across the primary, secondary, and tertiary sectors. The

findings are interpreted in terms of observable patterns and sectoral differences and do not imply a causal relationship between foreign labour and labour productivity.

## Organisation of Study

In the presentation of this study, there will be five chapters. The first chapter introduces the study; Chapter Two is reserved for the literature review of the study; Chapter Three presented the explanation of the methodology adopted in this study; Chapter Four discussed the results and findings; and finally, Chapter Five concluded the study, as well as giving relevant recommendations.

## RELATED LITERATURE

### Introduction

This section presents a comprehensive review of previous and recent studies examining foreign labour and labour productivity across the three major economic sectors in both developing and developed countries. Although numerous studies have examined the factors associated with labour productivity, the existing literature has predominantly focused on developed countries, with comparatively fewer studies examining developing economies. Previous studies have also commonly focused on specific economic sectors, providing different perspectives on the role and involvement of migrant labour in relation to labour productivity. This review therefore highlights the existing evidence on foreign labour utilisation and labour productivity across different economic sectors and identifies the research gap addressed by the present study.

Among the determinants that will be focussed in this study are the employment numbers of data in economic sector, which will be divided into two categories, the first one is the foreign workers data, and the second one

is the data on the local workers in Malaysia. The other factors consist of the contribution of capital investment in the economic sector; and the total utilisation rate data of the intermediate input as well as wages, which will be analysed as a determinant factor that contributes to the economic sector labour productivity activity. Some of the previous studies had used the time series data method, whilst some had utilised the panel data method for analysing and determining the factors that will and have the most effect upon the labour productivity in the economic sector.

### Theory

Evsey Domar (1946) in his paper titled 'Capital Expansion, Growth Rate and Employment' presented the first neoclassical mathematical proposal on the mechanism of economic development. Domar also studied the association between aggregation of capital and optimum employment. Domar's stated that an economic system of a country should have been in balance once the production capacity is parallel to the national income. Domar followed a basic principle in which the efficiency of workforce is essential to the model of economic development. His concept was focused on the idea that the national income growth rate was a result of labour growth and productivity (Domar, 1946). The method implemented by Domar was founded on the basic balance theory, which is the market saturation. He established his model in an isolated market environment, by keeping aside the chance of external economies or disorder economies. In the form of production-side, the growth rate in the production function was a function of the following order's productive capacity-capital ratio according to time (Domar, 1946).

Then, in year 1956, Solow established a long-run growth of mathematical model of neoclassical by focussing on the critique of the Keynesian Harrod-Domar Model. This is based on the fact that it was a single factor model in which capital investment was the only growth factor. Solow's biggest contribution is to interpret the neoclassical theory of growth. His first early work was the study "A Contribution to the Theory of Economic Growth" (1956), in which Solow ignored the standard Keynesian concept of a fixed ratio of factors in production, and implemented a variable ratio. His model's foundation for growth was, on the one hand, the replacement of labour by capital, and, on the other, technology innovations, something that he perceived to be

the main factor of long run growth. Solow used the concept of Cobb-Douglas production, which indicated the functional dependent on labour growth and capital growth of the national product growth developed for the US economy in the late 1920s by mathematician Charles W. Cobb and economist Paul Douglas (Solow, 1956). This production function is shown as follows:

$$Y = AK^{\alpha}L^b \quad (2.1)$$

Where Y = Output, L = Labour, K = Capital, A = Multifactor Productivity

$0 > a, b < 1, a+b = 1$  showing continuous returns to scale. Solow mentioned that any increment in output Y, might act as a consequence of the following:

1. Increment in labour, L. But due to declining returns to scale, increment in labour, indicates decreased in output per worker or labour productivity (Y/L).
  2. Increment in capital, K. Increment in the stock of capital would rise both output and labour productivity.
  3. Increment in multifactor productivity (A). This would result in the rise of labour productivity.
- Regarding the Solow growth model, the core variable is labour productivity.

The concept of labour productivity is output per worker. This is to what extent the available economic worker is capable of producing. Output per employee is determined by having the Total Gross Domestic Product (RGDP) or output Y of the economy, and dividing it by the labour market L of the country. This measure, output per worker  $Y / L$ , is the most simplistic proxy for the economy's living standards and level of economic growth. Solow, in an attempt to focus on what influenced labour productivity, has made it as subject of the formula and reorganised as in equation (2.2):

$$Y/L = AK^{\alpha}L^{b-1} = AK^{\alpha} / L^{1-b} \quad (2.2)$$

Since it was expected that  $a + b = 1$  then  $a = 1 - b$ . Rewriting equation (2.3)

$$Y/L = AK^{\alpha} / L^{1-b} = AK^{\alpha} / L^a \quad (2.3)$$

Let  $Y/L = y$ , and  $K/L = k$  then, hence below

$$y = Ak^{\alpha} \quad (2.4)$$

This is the key formula to be concentrated on for the economic model. The focus of the study is also on how the model works when growth comes from accumulation of capital and labour, particularly in local and foreign workers, intermediate input, and how it occurs when wages affect growth.

In addition, most previous studies used Solow theory in Cobb Douglas production function to analyse production function relationships, such as Peri (2012) who adopted the Cobb Douglas function to study the long run impacts of foreign labour influx into the American labour market in 1960, 2000 and 2006. The results showed that international workers have a positive effect on the expertise of native labours. Besides this, there is no proof that foreign labour takes over the employment, instead it facilitates productive specialisation and enables greater usage of technology among the less skilled employees. Furthermore, a study by Basri et al., (2018) also adopted Cobb Douglas to examine the impact of actual salaries and industry-specific variables (training, IT, R&D) on labour productivity in 44 Malaysian sub-sectors.

### The Determinants of Labour Productivity

In this review study, there are several factors of labour productivity that comprise capital, intermediate input, local labour, and foreign labour.

## Capital

Capital intensity is frequently defined as a total assets ratio or tangible assets to revenue or labour inputs which then define an organisation's efficacy in utilising its assets to produce goods or services (Chang & Singh, 1999; Sen & Farzin, 2000). The nature of economic operation may often influence the level to which a certain aspect is chosen against the other, based on the size of the capital and labour available in either the professional or the regional area (Ciccone & Hall, 1996). Moreover, the decreasing in capital-labour ratio is in accordance with large influx of foreign labour, demonstrating that large influx of foreign workers might influence the decisions made by organisation in investing on new technologies (Peri, 2012).

Furthermore, Noor et al., (2011) found a negative impact between worker productivity and the ratio of capital. This indicated that the manufacturing sector in Malaysia is naturally labour intensive, as any increase in capital utilisation would result in an increment of ratio for capital labour, which negatively influence labour productivity. Conversely, capital labour ratio, exhibited positive impact on labour productivity, as stated by Ismail et al., (2012) that the ratio of capital labour has significant influences on the growth of labour productivity, specifically in the manufacturing sector and its sub-sectors. Moreover, the ratio of research budget-labour, land-labour, and capital-labour are the main factors that positively influenced the labour productivity of rice production in Thailand between 1970 until 2014 (Suphannachart, 2017). Meanwhile, a study on agricultural productivity by Anik et al., (2017) in South Asia, had identified the key drivers of agricultural productivity growth are the grants due to enhancement in natural, human and technological capitals.

Moreover, it is confirmed that investments in capital assets is a crucial factor that influenced labour productivity, as well as formal and informal education, and enhancement of labour's health, physically and mentally. Besides, Palel et al., (2016) determined that local labour, migrant labour, foreign direct investment (FDI), and capital intensity have significantly positive impacts on the growth of labour productivity. Additionally, labour productivity can be enhanced through the effective adoption of digital technologies, provided that employees possess the necessary competencies to utilise these tools efficiently. This highlighted the importance of ongoing skills development and capacity-building programmes to support technology-driven productivity growth (Zikalala & Khoza, 2026).

## Local Labour

Local labour refers to the total number of citizens throughout their physical and mental human efforts used in the economic sector to produce goods and services. Even when foreign workers can improve global economic performance, flows of foreign workers can also build winners and losers. Therefore, it is not surprising that there has been a large amount of research and political debate on how international labour practices impacted local labour markets in other countries. On one side, foreign workers may reduce domestic worker demand through a direct substitution effect (David, Dorn, & Hanson, 2013). However, in contrast, foreign workers will reduce production costs and increase production efficiency, therefore rising demands for domestic workers (Peri, 2012). In fact, both foreign and local labours have significantly positive impacts on the growth in labour productivity, but the importance of migrant labour to labour productivity is relatively lower compared to local labour (Palel et al., 2016).

## Foreign Workers

The study on the effects of foreign workers on productivity varied. A study by Ortega and Peri (2014) in the large cross-sectional of nations whereby the levels of the lack of restriction on accessibility of foreign workers has raised the long-term per-capita income by encouraging whole productivity factor. Furthermore, in OECD countries, Alesynska and Tritah (2015) identified that foreign workers produced positive relationship on labour productivity effects. Additionally, Kangasniemi, Mas, Robinson, and Serrano (2012) studied the impact of foreign workers in large economic sectors of Spain and the United Kingdom, and found that even though migrant workers' productivity growth was lower in Spain, their impact was considered to have positive relationship in the UK.

Moreover, in the United States, Peri (2012) discovered that foreign workers are increasingly productive to the country; whilst Quispe- Agnoli and Zavodny (2002) suggested that the regional share of foreign workers and productivity growth showed a negative relationship. Huber et al., (2010) found a list of E.U. countries which were sensitive to the estimation criteria, having positive relations between productivity and foreign workers. Meanwhile, in some sectors, the skilled foreign workers and natives are imperfect substitutes in one sector, but in other sectors, they complemented each other. Besides, some studies showed that even large inflows of competence migrant workers have limited impacts on domestic workers (Ma, 2020). In addition, a study by Pillai (1998) on the 1997 Asian economic crisis effect of the Malaysian foreign labour, implied that the economic crisis would further increase foreign workers inflows into the country, especially in illegal way of foreign labour. The author also forecasted the crisis is significant in reducing foreign labour income and employment conditions in low-end industries that have been highly impacted by the crisis, such as manufacturing, construction, and services, thus suggesting Malaysia to implement a supplementary particular structure on foreign workers in the future.

Furthermore, Kurus (1998) investigated the 1997 Asian economic crisis impact on the foreign labour, which only focussed on the area of Sabah where foreign workers comprised a big percentage of its population in the area (Abubakar, 2002). Comparable to earlier studies, Kurus (1998) also suggested that the Malaysian Government should enforce an additional systemic approach for controlling and facilitating the amount of foreign labour within the country, which could be obtained by establishing joint agreements with the sending countries. Since the studies on the labour productivity effects of foreign workers in this economic sector is scarce, the findings of this study offer some valuable new insights into the dispute on the function of incompetence migrant workers, specifically in the economic sector in Malaysia.

### **Foreign workers effect in the primary sector**

Gutierrez (2002) found that countries with greater productivity of agricultural labour had higher expenditure levels in physical and human capital. Agricultural transition is a long-term venture through which experience told us that R&D-led productivity gains is the main driver to the system (Pardey and Alston, 2019). Agricultural productivity can be driven in the long-term by government policies designed to facilitate the establishment of organisations that will motivate farmers to invest, improve employable skills, and implement new methods of production. A study on businesses conducted in rural areas by Mece (2016) found that there were difficulties in recruiting local agricultural workers who are able to meet the expertise required for their employment requirement. Moreover, the labour market did not seem to have appropriate tools for spreading job information.

Although there are differences within the country, there tends to be an indication supporting the positive impact of foreign workers on agricultural productivity. Bove and Elia (2017) determined that such a positive effect relied on international workers to bring in a range of different skills and experiences that promote technological advancement and encourage entrepreneurial activity and this contribution appeared to be more important in developing countries. Klocker et al., (2018) implied that the experience of foreign labour is the main factor of adaptation to climate change in agricultural production.

Foreign workers in agriculture played the role as environmental developers, bringing skills that also improved and increased productivity in the larger rural economy, as supported by other studies and in other contexts such as Australia (Campbell, 2019), Greece (Papadopoulos, 2018) and Spain itself (Gomez-Tello & Nicolini, 2017). The significant aspect of this area of empirical research is that in seasonal or periodical industries, such as in agriculture, foreign workers might partake in operational efficiency as they represented a highly mobile manpower that played an important role in meeting periodic demand of worker even as the utilisation of local workers is decreasing (Campbell, 2019).

In this case, Siudek and Zawajska (2016) studied foreign agricultural labours from Poland to the United Kingdom and discovered that foreign workers are crucial to the agriculture of the old member states, as natives are more reluctant to tolerate less incomes and unpleasant working environments and did not often fulfil the demands of employers in terms of employment motivation and mobility. Europe's migration policy has played

a crucial role in managing the availability of refugees and in shaping different categories of employees, primarily in catering the requirements of the food production industry (Rye, 2018).

### **Foreign workers effect in the secondary sector**

The study done by Thangavelu (2016) on the productive contribution of local and foreign employees in the manufacturing sectors in Singapore showed that foreign workers have some productive effects on the manufacturing industry, but are far lower than those obtained by local employees. In addition, a study done by Noor et al., (2011) aimed at the impact of foreign labour in Malaysia's manufacturing sector on labour productivity over the period 1972 to 2005 found that foreign labour has a positive and significant influence on labour productivity. Moreover, this study has determined that foreign labour, as well as its productivity, is not a substitute or a complement to local labour.

Additionally, it has been identified that foreign labour, has a negative and significant effect on labour productivity. Palel et al., (2016), with regard to the differences of foreign and local workers in manufacturing sector of Malaysia, there were groups of skilled and unskilled labours. The results showed that incompetent local and foreign labours had a significantly negative impact on labour productivity in long-term growth. Conversely, competent local and foreign labours had a significantly positive impact the growth of labour productivity. However, migrant workers were significant to smaller labour-productivity growth than the local workers. A recent study conducted by Jordaan (2018), using specific industrial statistics between 2005 to 2009, showed that both competent and incompetent foreign workers had significant impacts on productivity in Malaysian manufacturing industries.

### **Foreign workers effect in the tertiary sector**

Traditionally, foreign employees made up a large portion of the hospitality industry. The supply of these foreign workers movements comprises ethnic restaurants, pubs, cafes, and ice cream shops in western countries. Throughout the 1950s, a growing number of foreign workers from the South Asia and Caribbean worked in Britain to help overcome staffing deficiencies in transport, health, and hospitality (Broadbridge, 2008). Meanwhile, in 1971, about half of all hotel employees in London were foreign workers (Harrison, 1995). Lucas and Mansfield (2010) also indicated that employment in the hotel industry employers have several reasons for hiring foreign workers.

There are several factors on why foreign workers might have an impact on productivity and efficiency. First, in terms of expertise and experience, they might be different from the local staff. This can become a crucial determinant in the racial and ethnic segmentation of the labour market (Choi et al., 2000; Williams, 2007). Moreover, many hospitality positions are socially constructed, for both men and women, and other employments are specific to gender and nationality. For example, Polish women were assigned to work in London hotels especially in the housekeeping sector (Batnitzky et al., 2008), whilst Albanian workers were being employed in Greek kitchens (Lazaridis & Wickens, 1999). Furthermore, a study carried out by Muhamad et al (2026) highlighted that service delays might arise from inefficiencies in labour deployment, reducing overall labour productivity and organisational performance.

Secondly, in terms of cultural purposes, foreign workers might have distinct attitudes to work as their working background are different from those local employees (Scott 2013; Blanchflower, Saleheen, & Shadforth, 2007; Dustman & Weiss, 2007). In addition, foreign workers are generally regarded as "good employees" such as being fully dedicated, loyal and reliable (Lyon & Sulcova, 2009; Matthews & Ruhs, 2007). Evidently, this statement is confirmed as employers in a variety of industries, including hospitality, have stated positive feedback on the common behaviour and work standards of foreign workers in comparison to local workers. They have lower turnover and more likely to work longer and more flexible hours. Additionally, it is believed that foreigners are better suited to work in customer-facing jobs (Dyer, McDowell, & Batnitzky 2008; Scott, 2013) and doing repeated daily tasks (Waldinger & Lichter, 2003), in which both characteristics were described in the hotel tasks and description of job (Janta et al., 2011).

The third factor is focused on income difference, foreign workers are amenable than local workers to work at less income (Piore, 1979; Blanchflower et al., 2007; Dustman & Weiss, 2007). Many studies also found other benefits to employing a foreign worker as a decrease of labour market pressure (inflation of wages). Revisiting hotel sector matters, a study on small and medium-sized hotel managers in London by Markova et al., (2016) found that employers preferred foreign workers more than local workers due to the former were willing to work for lower wages and they had positive job skills such as willingness, reliability, and commitment to work flexibly compared to local workers.

There is inadequate study on the relationship between foreign workers employment in services sector and productivity. On the analysis of flexible work and the employment of foreign workers as factors of success in hotels, a study by Yaduma et al., (2015) showed that there was a positive association between performance and flexible work and foreign employment in the services sector such as in hotels. Moreover, Kangasniemi et al., (2009), had adopted the growth accounting models, and identified that the employment of foreigners in the United Kingdom between 1996 and 2005 generally provided 0.29% growth, but this was significantly higher in hotels and restaurants (0.73%). The usage of foreign workers in Spain was correlated with lower productivity, but there was a positive but insignificant relationship in the U.K., using a production function approach model (Kangasniemi et al., 2009). In Canada, Li and Prescott (2010) found a positive association of foreign workers with productivity.

The inflow of foreign workers will have both a beneficial and a negative effect on an economy. Its effects on the labour market relies on its function, whether as a replacement or as a supplement to local employees. Borjas (1993) identified the negative impact of the foreign workforce. However, the study showed that such adverse impact effect is only significant for incompetent foreign labour. The impact on a business from the entry of foreign labour depends on their productivity. Competent, highly productive, foreign workers will contribute positively to the economy. Unskilled foreign workers, on the contrary, might have difficulties adjusting and might eventually need more help than the ability to contribute (Hercowitz et al., 1999).

### **Intermediate Input**

Intermediate inputs refer to goods and services, instead of capital assets, used as inputs into an establishment's production process, which are generated or manufactured elsewhere in the economy. They may be changed by the production process or even used up. Throughout history, capital and labour have persisted as the main drivers of output in the study of economic growth (Burnside, 1996). Even then, economic research did not assign all changes in output to labour and capital. The differences in changes in output that are not caused by labour and capital is defined as the intermediate input that has recently gained significance as it takes the sustainability of growth into account (Schreyer & Pilat, 2001). Hence, there is an association between the intermediate input and the output changes. Growing factor output will therefore lead to increase production, resulting in an expansion of the number of intermediate inputs, therefore, this rise of intermediate inputs is an impact of a successful transformation (Hulten, 1978).

On the other hand, intermediate input has been found to have a negative association with growth, specifically in industries with higher intermediate input volume that have been found to have lower economic productivity compared to others. The strength of the factor would also supply knowledge on the returns to scale of the economic operation (Baptist & Hepburn, 2013). In comparison, a recent study found that materials were rarely included in the theoretical economic output functions and identified that intermediate import and export inputs (both intra- and inter-industry) with highly developed economies played crucial roles in productivity growth of a country (Lee, 2020).

### **Wages**

Wages and productivity are significant measures for the economy. Productivity estimated the production generated by the employees in different economic sectors. Wage is the employees' compensation (remuneration) for making the product, which is part of the overall production cost. Productivity gains defined economic growth, and wage increases raised living standards, as well as alleviating poverty. Being said, an

improvement in labour productivity is a fundamental cause of the increase in wages, thus enhancing the quality of life (Tsoku and Matarise, 2014). As incomes rise in accordance with rises in productivity, they are also sustainable and generate opportunities or encouragement for more economic growth by growing the purchasing power of households (ILO, 2015). Labour efficiency and incomes are inter-related in Indian manufacturing industries, which with the increased in labour productivity improves economic growth (Jain, 2019).

Meanwhile, as low and high skills complemented production, foreign workers raised the efficiency and incomes of highly competent workers, the recommence of education enhancement, and locals have more opportunities to further their education (Brunello et al., 2017). Furthermore, Knoppe (2018) suggested that experience and enhanced skills could boost income prospects significantly, resulting in some confluence of employment incomes. Hence, in future, it will be extremely crucial to boost the skills of those low-salary workers. Long-term movement for senior workers is low, as incomes are larger, depending on the initial levels of education and the entry-level period of one's career.

## METHODOLOGY

### Introduction

This section discusses the theoretical framework, data collection, and data analysis of the study. The types of tests for the data are defined in order to explain the results that will be generated. All data analysis were performed based on the objectives of the study. This chapter looks at the data descriptive of foreign labour with other factors towards labour productivity on three different sectors namely, primary, secondary and tertiary sector in Malaysia using descriptive mean analysis data of the static panel data handling procedures.

### Model Specification

In general, the evaluation of labour efficiency is analysed using the neoclassical production function (Mahmood, 2008). The Solow growth model is adopted in this study, by conducting the initial Cobb-Douglas production function in the Solow framework model (Noor et al., 2011). The fundamental formula of the function is as follows:

$$Y_t = AK_t^\alpha L_t^\beta Mat_t^\theta Wages_t^\mu \quad (\text{Equation 1})$$

From the equation above,

Y denotes the aggregate output,

A denotes the multifactor productivity,

K denotes the capital input in the form of physical capital stock,

L denotes the labour input in the form of the total number of workers and

Mat denotes the value of intermediate input which is in the form of material.

Intermediate input (material) was integrated into the model as a supplementary for existing literature (Baptist & Hepburn, 2013; Ahmed, 2006). Moreover, salary was also added into the model as an addition input in Cobb Douglas production function (Trpeski et al., 2016).

### Econometric Model

Based on the Solow Cobb Douglas production function Model, all variables in the equation was divided by the whole of labours to transform it into labour productivity formula (Noor, 2011). In this study, wages was added into the equation. Additionally, in this equation, labour had been categorised into two groups: local labour and foreign labour. All the variables were then converted into logarithm. The estimated equation is as follows:

$$\ln LPR_{it} = A + \beta_1 \ln capital_{it} + \beta_2 \ln local_{it} + \beta_3 \ln foreign_{it} + \beta_4 \ln intermediate_{it} + \beta_5 \ln wages_{it} + \epsilon_{it}$$

(Equation 2)

Referring to the equation above, where  $i = 1, \dots, N$  for each industry in the sector of the panel and  $t = 1, \dots, T$ , refers to the time. In the meantime,

$\ln LPR$  = logarithm of labour productivity (Gross Domestic Product /total number of labours).

$\ln capital$  = logarithm of capital (fixed assets / total number of labours)

$\ln local$  = logarithm of local labour (number of local labours / total number of labours).

$\ln foreign$  = logarithm of foreign labour (number of foreign labours / total numbers of labours).

$\ln intermediate$  =logarithm intermediate input (intermediate input / total numbers of labours).

$\ln wages$  = logarithm of the wage rate, (wage /total number of labours)

### Methodology and Estimation of Models

This study employed panel data of descriptive mean analysis, where the data were requested from the Department of Statistic Malaysia (DoSM). The cross-section part of the panel is for three economic sectors, which are primary, secondary and tertiary sectors which altogether consisted of ten industries ( $N=10$ ).  $N$  is the sub-sectors industries in the three different sectors that consisted of primary, secondary and also tertiary. For the primary sector there were five different industries such as farming, livestock, fishing, forestry, as well as logging. Whereas, for the secondary sector there were two industries, namely mining and quarrying, along with manufacturing, and construction. Moreover, the tertiary sector comprised three sub-sectors industries, specifically wholesale and retail as well as trade of motor and motor vehicle repair; food and drink as well as accommodation; along with administration and support services, whilst for the time-series part of the panel involved annual data from 2010 until 2020 ( $T = 11$ ).

### Data Analysis and Findings

The table below is a summary of the descriptive statistics for labour productivity (LPR), intermediate input (LIN), local labour (LLOC), foreign labour (LFOR), salary (LSAL), and fixed assets (LFIXED). The findings from the Jarque-Bera test showed that the data were usually distributed, indicating that the data has distortion and flatness that matched a normal distribution.

Table 1, 2 and table 3 below showed the summary of statistics per sector from 2010 to 2020. Secondary sector reported to have the highest level of labour productivity with the mean of 6.1218, followed by primary sector with the mean of, 4.0382, whilst the lowest sector is in tertiary sector with the mean of, 3.5335. In these selected sector, secondary sector inhabited the largest involvement of foreign labour with the mean of -1.9030 and followed by tertiary sector with the mean of -1.7756, whilst the lowest involvement of foreign labour is from primary sector with the mean of -1.3476. Conversely, the largest involvement of local labour is in primary sector with the mean of -0.3301, followed by tertiary sector with the mean of 0.2227, whereas the lowest involvement of local labour is in secondary sector with mean of -0.1876.

**Table 1: Summary of Statistics for Primary Sector**

| Primary Sector | LPR    | LIN    | LLOC    | LFOR    | LSAL   | LFIXED |
|----------------|--------|--------|---------|---------|--------|--------|
| Mean           | 4.0382 | 3.2687 | -0.3301 | -1.3476 | 1.6797 | 3.6714 |
| Median         | 3.9468 | 3.1602 | -0.2973 | -1.3580 | 1.7535 | 3.5727 |
| Maximum        | 5.0208 | 4.6335 | -0.1536 | -0.8789 | 2.3653 | 4.5038 |
| Minimum        | 3.3459 | 2.1759 | -0.5364 | -1.9491 | 1.0783 | 2.7918 |

| Primary Sector | LPR     | LIN     | LLOC    | LFOR     | LSAL    | LFIXED  |
|----------------|---------|---------|---------|----------|---------|---------|
| Std. Dev.      | 0.4913  | 0.8635  | 0.1309  | 0.3542   | 0.3423  | 0.4475  |
| Skewness       | 0.1610  | 0.0648  | -0.2736 | -0.1884  | -0.1413 | 0.2386  |
| Kurtosis       | 1.8446  | 1.2781  | 1.7097  | 1.7184   | 2.1438  | 2.4088  |
| Jarque-Bera    | 1.3186  | 2.7332  | 1.8007  | 1.6357   | 0.7451  | 0.5291  |
| Probability    | 0.5171  | 0.2549  | 0.4064  | 0.4413   | 0.6889  | 0.7675  |
| Sum            | 88.8407 | 71.9114 | -7.2626 | -29.6482 | 36.9545 | 80.7715 |
| Sum Sq. Dev.   | 5.0704  | 15.6592 | 0.3600  | 2.6353   | 2.4610  | 4.2071  |

Source: Researchers Computation (2026)

**Table 2: Summary of Statistics for Secondary Sector**

| Secondary Sector | LPR      | LIN      | LLOC    | LFOR     | LSAL     | LFIXED   |
|------------------|----------|----------|---------|----------|----------|----------|
| Mean             | 6.1218   | 5.3161   | -0.1876 | -1.9030  | 3.5937   | 5.2009   |
| Median           | 6.1978   | 5.7140   | -0.2099 | -1.6638  | 3.4765   | 4.8503   |
| Maximum          | 7.6359   | 6.1097   | -0.0500 | -1.2895  | 4.7875   | 8.4651   |
| Minimum          | 4.4352   | 4.0049   | -0.3221 | -3.0200  | 2.9084   | 2.4728   |
| Std. Dev.        | 1.0578   | 0.6904   | 0.0829  | 0.5466   | 0.5480   | 2.1550   |
| Skewness         | -0.0970  | -0.6069  | 0.4733  | -0.8863  | 0.6942   | 0.2943   |
| Kurtosis         | 1.6947   | 1.8897   | 1.8033  | 2.1865   | 2.3145   | 1.5614   |
| Jarque-Bera      | 2.3942   | 3.7212   | 3.2014  | 5.2308   | 3.2970   | 3.3219   |
| Probability      | 0.3020   | 0.1555   | 0.2017  | 0.0731   | 0.1923   | 0.1899   |
| Sum              | 202.0219 | 175.4344 | -6.1909 | -62.8020 | 118.5936 | 171.6322 |
| Sum Sq. Dev.     | 35.8105  | 15.2545  | 0.2201  | 9.5608   | 9.6121   | 148.6121 |

Source: Researchers Computation (2026)

**Table 3: Summary of Statistics for Tertiary Sector**

| Tertiary Sector | LPR     | LIN     | LLOC    | LFOR    | LSAL    | LFIXED  |
|-----------------|---------|---------|---------|---------|---------|---------|
| Mean            | 3.5335  | 2.8006  | -0.2227 | -1.7756 | 1.774   | 2.9914  |
| Median          | 3.5815  | 3.0384  | -0.1714 | -1.8481 | 1.6974  | 3.0204  |
| Maximum         | 5.0408  | 4.094   | -0.0863 | -0.7238 | 3.242   | 3.9944  |
| Minimum         | 2.3504  | 1.5554  | -0.6633 | -2.4925 | 0.7407  | 1.5768  |
| Std. Dev.       | 0.9282  | 0.9119  | 0.1504  | 0.4789  | 0.7867  | 0.5852  |
| Skewness        | 0.2539  | -0.1376 | -1.6929 | 0.6725  | 0.4484  | -0.3373 |
| Kurtosis        | 1.756   | 1.5405  | 4.8162  | 2.7773  | 1.9933  | 2.5632  |
| Jarque-Bera     | 3.3099  | 4.0442  | 27.0648 | 3.408   | 3.3328  | 1.184   |
| Probability     | 0.1911  | 0.1323  | 0       | 0.1819  | 0.1889  | 0.5532  |
| Sum             | 155.476 | 123.23  | -9.8015 | -78.129 | 78.0579 | 131.623 |
| Sum Sq. Dev.    | 37.0547 | 35.7635 | 0.9737  | 9.8657  | 26.6187 | 14.7277 |

Source: Researchers Computation (2026)

## CONCLUSION AND RECOMMENDATION

Based on the descriptive statistical analysis, labour productivity varies across the three major economic sectors in Malaysia, namely the primary, secondary, and tertiary sectors. The findings indicate that the secondary sector recorded the highest level of labour productivity, followed by the primary sector, while the tertiary sector exhibited the lowest labour productivity. In terms of labour composition, the secondary sector also showed the highest involvement of foreign workers, followed by the tertiary sector, whereas the primary sector had the lowest proportion of foreign labour participation.

The descriptive results further reveal notable differences in the distribution of foreign workers among the sectors, suggesting that foreign labour plays a prominent role, particularly in sectors with relatively higher productivity levels. These findings provide an overview of sectoral labour productivity and foreign labour participation patterns in Malaysia and highlight the importance of considering sector-specific characteristics when examining labour market dynamics.

Overall, the descriptive analysis contributes to the existing literature by providing comparative evidence across different economic sectors rather than focusing on a single sector. The findings offer preliminary insights into the association between foreign labour involvement and labour productivity; however, descriptive statistics alone cannot determine the nature or strength of this relationship. Therefore, future studies should employ inferential and econometric analyses to examine whether foreign labour has a significant positive or negative effect on labour productivity across sectors. Such analyses would provide a more comprehensive understanding of the role of foreign workers in supporting productivity growth and economic development in Malaysia.

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## REFERENCES

1. Abubakar, S. Y. (2002). Migrant labour in Malaysia: impact and implications of the Asian financial crisis. *EADN Regional Project on the Social Impact of the Asian Financial Crisis*.
2. Ahmed, E. M. (2006). Carbon dioxide emissions, impact on Malaysia's manufacturing productivity growth. *World Review of Science, Technology and Sustainable Development*, 3(1), 58-69.
3. Aleksynska, M., & Tritah, A. (2015). The heterogeneity of immigrants, host countries' income and productivity: a channel accounting approach. *Economic Inquiry*, 53(1), 150-172.
4. Anik, A. R., Rahman, S., & Sarker, J. R. (2017). Agricultural productivity growth and the role of capital in South Asia (1980–2013). *Sustainability*, Vol 9(3), No 470, pp. 1-24
5. Ariu, A. (2020). Foreign Workers, Product Quality, and Trade: Evidence from a Natural Experiment. [https://www.cesifo.org/sites/default/files/events/2020/del20\\_Ariu.pdf](https://www.cesifo.org/sites/default/files/events/2020/del20_Ariu.pdf)
6. Baptist, S., & Hepburn, C. (2013). Intermediate inputs and economic productivity. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 371 1-21.
7. Basri, N. M., Karim, Z. A., Ismail, R., & Sulaiman, N. (2018). The effect of wages and industry-specific variables on productivity of manufacturing industry in Malaysia: A dynamic heterogeneous panel evidence. *International Journal of Economics and Management*, 12(2), 379–391.
8. Batnitzky, A., McDowell, L., & Dyer, S. (2008). A middle-class global mobility? The working lives of Indian men in a west London hotel. *Global Networks*, 8(1), 51-70.
9. Blanchflower, D. G., J. Saleheen, and C. Shadforth. (2007). The Impact of Recent Migration from Eastern Europe on the UK Economy. IZA Discussion Paper No. 2615
10. Borjas, G. J. (1993). The intergenerational mobility of immigrants. *Journal of Labor Economics*, 11(1, Part 1), 113-135
11. Bove, V., & Elia, L. (2017). Migration, diversity, and economic growth. *World Development*, 89, 227-239
12. Broadberry, S. N. (1998). How did the United States and Germany overtake Britain? A sectoral analysis of

- comparative productivity levels, 1870-1990. *Journal of Economic History*, 58(2), 375-407.
13. Broadbridge, A. (2008). Human Resource Management for Tourism, Hospitality, and Leisure: An International Perspective, T. Baum. Thomson, London (2006)(326pp., ISBN: 1-84480-196-9).
  14. Brunello, G., Weber, G., & Weiss, C. T. (2017). Books are forever: Early life conditions, education and lifetime earnings in Europe. *The Economic Journal*, 127(600), 271-296.
  15. Burnside, C. (1996). Production function regressions, returns to scale, and externalities. *Journal of monetary Economics*, 37(2), 177-201.
  16. Campbell, I. (2019). Harvest labour markets in Australia: Alleged labour shortages and employer demand for temporary migrant workers. *The Journal of Australian Political Economy*, 84, 46-88.
  17. Ciccone, A., & Hall, R. E. (1996). Productivity and the density of economic activity. *The American economic review*, 54-70.  
<https://repositori.upf.edu/bitstream/handle/10230/20837/120.pdf?sequence=1>
  18. Chang, S. J., & Singh, H. (1999). The impact of modes of entry and resource fit on modes of exit by multibusiness firms. *Strategic Management Journal*, 20(11), 1019-1035.
  19. Choi, J. G., Woods, R. H., & Murrmann, S. K. (2000). International labor markets and the migration of labor forces as an alternative solution for labor shortages in the hospitality industry. *International Journal of Contemporary Hospitality Management*, Vol. 12 No. 1, pp. 61-7
  20. David, H., Dorn, D., & Hanson, G. H. (2013). The China syndrome: Local labor market effects of import competition in the United States. *American Economic Review*, 103(6), 2121-68.
  21. Department of Statistics Malaysia. (2020). Department of Statistics Malaysia Press Release Employment Statistics 2020, Malaysia. (November).
  22. Domar, E. D. (1946). Capital expansion, rate of growth, and employment. *Econometrica, Journal of the Econometric Society*, 14, 137-147.
  23. Dustmann, C., & Weiss, Y. (2007). Return migration: theory and empirical evidence from the UK. *British Journal of Industrial Relations*, 45(2), 236-256.
  24. Dyer, S., McDowell, L., & Batnitzky, A. (2008). Emotional labour/body work: The caring labours of migrants in the UK's National Health Service. *Geoforum*, 39(6), 2030-2038.
  25. EPU (2015), The Eleventh Malaysia Plan Strategy Paper 1 : Unlocking the Potential of Productivity, Economic Planning Unit, Prime Minister's Department, Putrajaya
  26. Gen, T. Z., & Ng, A. (2017). *Productivity in Progress : Labour productivity in Malaysia over the last three decades*. Khazanah Research Institute, ed.
  27. Gomez-Tello, A., & Nicolini, R. (2017). Immigration and productivity: a Spanish tale. *Journal of productivity analysis*, 47(2), 167-183.
  28. Gutierrez, L. (2002). Why is agricultural labour productivity higher in some countries than others?. *Agricultural Economics Review*, 3(389-2016-23394), 58-72.
  29. Harrison, D. (1995). Development of tourism in Swaziland. *Annals of Tourism Research*, 22(1), 135-156.
  30. Hercowitz, Z., & Straczynski, M. (1999). *Cyclical bias in government spending: Evidence from the OECD*. Foerder Institute for Economic Research and Sackler Institute for
  31. Huber, P., Landesmann, M., Robinson, C., & Stehrer, R. (2010). Migrants' skills and productivity: A European perspective. *National Institute Economic Review*, 213(1), R20-R34.
  32. Hulten, C. R. (1978). Growth accounting with intermediate inputs. *The Review of Economic Studies*, 45(3), 511-518.
  33. International Labour Organization (ILO) (2015). Global wage report: Wages and income inequality 2014/15. Geneva: International Labour Organization
  34. Ismail, R., Rosa, A., & Sulaiman, N. (2012). Globalisation and labour productivity in the Malaysian manufacturing sector. *Review of Economic and Finance*, 2, 76-86
  35. Ismail, R., & Yuliyusman, F. (2014). Foreign labour on Malaysian growth. *Journal of Economic Integration*, 29(4), 657-675.
  36. Jain, H. (2019). Wage-Productivity Relationship in Indian Manufacturing Industries: Evidences from State-level Panel Data. *Margin: The Journal of Applied Economic Research*, 13(3), 277-305.
  37. Janta, H., Ladkin, A., Brown, L., & Lugosi, P. (2011). Employment experiences of Polish migrant workers in the UK hospitality sector. *Tourism Management*, 32(5), 1006-1019.
  38. Jordaán, J. A. (2018). Foreign workers and productivity in an emerging economy: The case of Malaysia.

- Review of Development Economics*, 22(1), 148-173.
39. Kangasniemi, M., Mas, M., Robinson, C., & Serrano, L. (2009). The economic impact of migration: Productivity analysis for Spain and the United Kingdom.
  40. Kangasniemi, M., Mas, M., Robinson, C., & Serrano, L. (2012). The economic impact of migration: productivity analysis for Spain and the UK. *Journal of Productivity Analysis*, 38(3), 333-343.
  41. Klocker, N., Head, L., Dun, O., & Spaven, T. (2018). Experimenting with agricultural diversity: Migrant knowledge as a resource for climate change adaptation. *Journal of Rural Studies*, 57, 13-24.
  42. Knoppe, C. (2018). *Wage income distribution and mobility in Malta* (No. WP/06/2018). CBM Working Papers.
  43. Kurus, B. (1998). Migrant labor: the Sabah experience. *Asian and Pacific Migration Journal*, 7(2-3), 281-295.
  44. Lazaridis, G., & Wickens, E. (1999). "Us" and the "Others": ethnic minorities in Greece. *Annals of tourism research*, Vol 26 No. 3, 632-655.
  45. Lee, D. (2020). The role of R&D and input trade in productivity growth: innovation and technology spillovers. *The Journal of Technology Transfer*, 45(3), 908-928.
  46. Li, P., & Prescott, D. (2010). Labour productivity in the Canadian tourism sector. *Canadian Tourism Human Resource Council*.
  47. Lucas, R., & Mansfield, S. (2010). The use of migrant labour in the hospitality sector: current and future implications. *Who needs migrant workers*, 159-86.
  48. Lyon, A., & Sulcova, D. (2009). Hotel employer's perceptions of employing eastern European workers: A case study of Cheshire, UK. *Tourism Culture & Communication*, 9(1-2), 17-28.
  49. Ma, J. (2020). High skilled immigration and the market for skilled labor: The role of occupational choice. *Labour Economics*, 63, 101791.
  50. Mahmood, M. (2008). Labour productivity and employment in Australian manufacturing SMEs. *International Entrepreneurship and Management Journal*, 4(1), 51-62.
  51. Markova, E., Anna, P., Williams, A. M., & Shaw, G. (2016). Migrant workers in small London hotels: Employment, recruitment and distribution. *European urban and regional studies*, 23(3), 406-421.
  52. Matthews, G., & Ruhs, M. (2007). *Are You Being Served?: Employer Demand for Migrant Labour in the UK's Hospitality Sector*. Centre on Migration, Policy and Society.
  53. Mece, M. (2016). Youth Employment in Rural Albania: A Theoretical Approach. *European Scientific Journal*, 12(10).
  54. Muhamad Aiman Zulhaikal Azizul, Shuib, A., Sarkam, N. A. & Mohd Yusoff, N. S. (2026). Factors Affecting Prolonged Waiting Times for Services of The Outpatients: A Preliminary Study In Malaysian Hospital. *Asian Journal of Social Science Research*, 8(1), 158–178.  
<https://doi.org/10.5281/zenodo.20822313>
  55. Noor, Z. M., Isa, N., Said, R., & Abd Jalil, S. (2011). The impact of foreign workers on labour productivity in Malaysian manufacturing sector. *International Journal of Economics and Management*, 5(1), 169-178.
  56. Okumu, I., & Mawejje, J. (2019). Skills and labour productivity in African manufacturing. *Development Policy Review*, <https://doi.org/10.1111/dpr.12431>.
  57. Ortega, F., & Peri, G. (2014). The aggregate effects of trade and migration: evidence from OECD countries. In *The Socio-Economic Impact of Migration Flows* (pp. 19-51). Springer, Cham.
  58. Palel, N. S. M., Ismail, R., & Awang, A. H. (2016). The impacts of foreign labour entry on the labour productivity in the Malaysian manufacturing sector. *Journal of Economic Cooperation & Development*, 37(3), 29.
  59. Pardey, P. G., & Alston, J. M. (2019). Transforming traditional agriculture redux. In *The Oxford Handbook of Structural Transformation*.
  60. Peri, G. (2012). The effect of immigration on productivity: Evidence from U.S. States. *Review of Economics and Statistics*, 94(1), 348–358. [https://doi.org/10.1162/REST\\_a\\_00137](https://doi.org/10.1162/REST_a_00137)
  61. Pillai, P. (1998). The impact of the economic crisis on migrant labor in Malaysia: policy implications. *Asian and Pacific Migration Journal*, 7(2-3), 255-280.
  62. Piore, M. J. (1979). *Birds of passage: Migrant labor and industrial societies*.
  63. Polyzos, S., & Arabatzis, G. (2005). Labor productivity of the agricultural sector in Greece: determinant factors and interregional differences analysis. *University of Thessaly, Department of Planning and*

- Regional Development Discussion Paper Series, 11 (12): 209, 226.*
64. Pritchard, R. D. (Ed.). (2002). *Improving organizational performance with the Productivity Measurement and Enhancement System: An international collaboration*. Nova Science Pub Incorporated.
  65. Prokopenko, J. (1987). *Productivity management: A practical handbook*. International Labour Organization.
  66. Quispe-Agnoli, M., & Zavodny, M. (2002). The effect of immigration on output mix, capital, and productivity. *Economic Review-Federal Reserve Bank of Atlanta*, 87(1), 17-28.
  67. Rukumnuaykit, P., & Pholphirul, P. (2016). Human capital linkages to labour productivity: implications from Thai manufacturers. *Journal of Education and Work*, 29(8), 922-955.
  68. Rye, J. F., & Scott, S. (2018). International labour migration and food production in rural Europe: a review of the evidence. *Sociologia Ruralis*, 58(4), 928-952.
  69. Sasso, S., & Ritzen, J. (2019). Sectoral cognitive skills, r&d, and productivity: A cross-country cross-sector analysis. *Education Economics*, 27(1), 35-51.
  70. Schreyer, P., & Pilat, D. (2001). Measuring productivity. *OECD Economic studies*, 33(2), 127-170.
  71. Scott, S. (2013). Labour, migration and the spatial fix: evidence from the UK food industry. *Antipode*, 45(5), 1090-1109.
  72. Sen, S., & Farzin, R. (2000). Downsizing, capital intensity, and labor productivity. *Journal of Financial and Strategic Decisions*, Vol 13 No 2, 73-81.
  73. Siudek, T., & Zawojcka, A. (2016). *Foreign labour in agricultural sectors of some EU countries* (No. 722-2016-48797).
  74. Suphannachart, W. (2017). What drives labour productivity in the ageing agriculture of Thailand?. *Advances in Management and Applied Economics*, 7(1), 89.
  75. Thangavelu, S. M. (2016). Productive contribution of local and foreign workers in Singapore manufacturing industries. *Journal of Economic Studies*. Vol. 43 No. 3, pp. 380-399.
  76. Trpeski, P., Eftimov, L., & Cvetanoska, M. (2016). Labor productivity and real wages in Macedonia: An overview before and after the global economic crisis. *European Scientific Journal*, 12(10).
  77. Tsoku, J. T., & Matarise, F. (2014). An analysis of the relationship between remuneration (real wage) and labour productivity in South Africa. *Journal of Educational and Social Research*, 4(6), 59-59.
  78. Waldinger, R., & Lichter, M. I. (2003). *How the other half works: Immigration and the social organization of labor*. Univ of California Press.
  79. Williams, A. M. (2007). Listen to me, learn with me: International migration and knowledge transfer. *British journal of industrial relations*, 45(2), 361-382.
  80. World Bank Group. (2018). *Productivity Unplugged: The Challenges of Malaysia's Transition into a High-Income Country*. (June), 132. Retrieved from <http://documents.worldbank.org/curated/en/185861527855417221/Productivity-unplugged-the-challenges-of-Malaysias-transition-into-a-high-income-country>
  81. Wye, C.-K., & Ismail, R. (2012). Sources of Labour Productivity Growth by Economic Sectors: A Study of Malaysia 1972 - 2005. *International Journal of Management*, 29(2), 760.
  82. Yaduma, N., Williams, A., Lockwood, A., & Park, S. (2015). Performance, labour flexibility and migrant workers in hotels: An establishment and departmental level analysis. *International Journal of Hospitality Management*, 50, 94-104.
  83. Zikalala, M. B., & Khoza Samuel Dumazi. (2026). Exploring The Benefits of Technology Instructions In Engineering Graphics and Design. *Asian Journal of Social Science Research*, 8(1), 290-305. <https://doi.org/10.5281/zenodo.20823107>