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MIGRATION AND DEVELOPMENT IN MALAYSIA: THE IMPACT OF IMMIGRANT LABOUR ON THE MANUFACTURING SECTOR, 1986-2010

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Abstract

The heavy reliance on immigrant labour in manufacturing remains a contentious issue and we address three concerns with respect to their impact: did they displace native workers or complement them? Did their influx impede real wage growth? And did they lower real productivity growth? We found that immigrants complemented local workers in the initial phase when a labour shortage emerged at prevailing wage levels but displaced them in later periods because employers favoured them due to significant non-wage cost savings. Immigrants did impede real wage rate growth although given the strong demand for labour that prevailed, wages did rise. Finally, the contention that immigrant labour use contributed to keeping productivity low found some support. In the light of these findings we discuss policy options with respect to immigrant workers.

Keywords: Immigrant labour; manufacturing; unskilled workers; real wage

JEL Classification Codes: J23, 015

INTRODUCTION

The labour market effects of immigration have been studied extensively in the US (for example, Card, 2001; Borjas 2003; 2005) and elsewhere (see Friedberg & Hunt, 1995 for a survey; Angrist & Kugler, 2003). Malaysia is an interesting case to study because, unlike in the US and Europe, post-independence immigration has comprised almost exclusively of unskilled workers from around the region. In fact, it has been described as the largest importer of labour in Asia with immigrants accounting for 21% of its workforce in 2010 and documented migrants alone numbering about 1.9 million (cited in Devadason and Chan, 2014).

The focus on manufacturing is appropriate because other sectors such as agriculture and construction, where immigrants concentrate, are widely perceived to offer low paying jobs with difficult conditions of work that native Malaysians shun. Immigrants are therefore seen to complement natives in these sectors. Manufacturing, on the other hand, paid relatively higher wages and had a more comfortable working environment. Thus permitting the use of foreign workers was seen as displacing and disadvantaging natives.

In 1990, only 8.8% of foreign workers were housed in manufacturing, relative to 37.7% in agriculture, 34.4% in construction and 19.1% in non-domestic services. Immigrant presence in manufacturing grew rapidly; by 2009, 32% was located in

manufacturing far exceeding their presence in sectors traditionally avoided by natives such as agriculture (26.1%), construction (15.6%) and non-domestic services (10.6%)[1].

The heavy reliance on immigrant labour has raised several concerns and three of them are taken up in this paper. First, it is widely believed, not just in Malaysia but elsewhere, that immigrant workers deprived natives of jobs (The Times, 5 January 2010, Briggs, Jr., 1996, Hartlog and Vriend, 1989). Second, is the related belief that the unimpeded supply of immigrant labour has thwarted legitimate wage increases in the sector and denied natives better standards of living (Camarota, 2002; Borjas, 2005; Briggs, Jr.,1996). Third, some scholars hold that while reliance on unskilled immigrant workers may sustain an activity, it seriously impairs productivity growth (Tham and Liew, 2004, Power, 1979). A fourth important question of whether industrial upgrading was impeded by the easy availability of immigrant workers has been discussed elsewhere[2].

Unfortunately, consistent time series data capable of supporting rigorous analyses are not available. What we attempted here is to piece together limited and scattered evidence to draw preliminary conclusions regarding these concerns.

The paper begins with a brief overview of the performance of the manufacturing sector. This is followed by a discussion on immigrant labour in manufacturing—the rationale for allowing their use and their distribution by subsectors. The main section of

[1] From data cited in Devadason and Chan, 2014.

[2] See Narayanan and Lai, 2012

the paper takes up the concerns arising from relying on immigrant labour in manufacturing. The paper concludes with a summary of the findings and a discussion of the implications.

OVERVIEW OF THE MANUFACTURING SECTOR

The impressive growth and transformation of Malaysian economy from an exporter of primary commodities such as tin and rubber to a major supplier of manufactured goods, especially electrical and electronics products, has been acknowledged in the development literature (World Bank, 1993). It was also highlighted as one of only 13 countries in the world to have enjoyed sustained growth of more than 7 per cent for over 25 years (Commission on Growth and Development, 2008: 19), although the Asian financial crisis of 1997-1998 broke this winning streak.

The shift in the Malaysian industrialisation effort from import substitution to export expansion in the 1970s was guided by two major concerns. First, there was the need to break the constraints imposed by the limited domestic market (Anuwar, 1992; Ariff, 1984). Second was the pressure to provide employment for a growing labour force (McGee, 1986; Mehmet, 1988). Rapid export oriented industrialisation was achieved by attracting foreign direct investment (FDA). Generous fiscal incentives were offered, along with the promise of cheap and abundant labour and discounted prices for land and utilities. This prompted the relocation of labour intensive production processes from the US, Japan, Singapore, Taiwan and Europe (Rasiah, 1995; Anuwar, 1992). With these changes, manufacturing overtook the agricultural sector, in terms of contribution to GDP, in 1987 (Ministry of Finance, 1988: 54).

The new emphasis in the industrial development policies naturally resulted in restructuring within manufacturing. In 1970, food and beverages, wood products, and chemical and petroleum products accounted for 64 per cent of manufactured exports, while the electronics and electrical products (EE) provided a mere three per cent. By 1989, this had changed dramatically with the EE subsector alone accounting for 52 per cent of the manufactured exports (Anuwar, 1992: 28). The phenomenal growth of the EE subsector was the result of the tremendous efforts made by the government to convince multinational companies (MNCs) to relocate their manufacturing plants to Malaysia, and especially to Penang and the Klang Valley (Hill, 1989; Narayanan and Rasiah, 1989). This subsector has since dominated manufacturing and accounted for a large share of manufactured exports; in 2010, its share stood at 55% (Bank Negara Malaysia, 2013, Annex Table A.11).

Export-oriented manufacturing remained as the major catalyst for economic growth till 2001. In subsequent periods, services emerged as the dominant sector. In 1987, the share of services in GDP was 42.7 per cent (Ministry of Finance, 1988: 54) but by 2010 it had enlarged to 53.2%. The sector provided 59 per cent of total employment in 2010. In contrast, manufacturing accounted for 25.2 per cent of the GDP and 18 per cent of total employment in 2010 (Bank Negara Malaysia, 2013, Annex Tables A1 & A7).

IMMIGRANT LABOUR IN MANUFACTURING

Immigrant workers were already being utilized in agriculture in the early 1970s (Azizah, 1995) but their numbers only became significant in the plantation and construction sectors in the 1980s (Mehmet, 1988; Narayanan, 1992; Gill, 1988). Foreign workers

gained acceptance in these sectors as they were seen to be filling up openings abandoned by natives, thereby complementing the latter. Employers argued that the extent of upward adjustments in wages necessary to attract natives would render these activities unprofitable (Audong and Tan, 2000). Nonetheless, it was always the expectation that these sectors would work towards minimizing the size of the foreign workforce (Malaysia, 1993: 52; Ministry of Finance, 1995: 39).

The call to allow foreign workers in manufacturing emerged in the late 1980s, as the economy recorded several consecutive years of buoyant growth. The bulk of the demand was for unskilled workers and emanated from the labour intensive segment of electronics, textiles, non-metallic and mineral subsectors. The scarcity of labour that emerged was portrayed as a threat to Malaysia's attractiveness to new and existing foreign investors (Pillai, 1991). In truth, manufacturing was neither unattractive to local workers nor were local labour was unavailable. Had wage adjustments been allowed, the scarcity might have been overcome by drawing workers from other sectors and attracting new entrants to the labour market. Instead, in November 1991, the government agreed to calls from employers to allow the use of foreign labour, provided employers showed that they could not get natives. However, the mechanics for establishing the inability to secure local workers remained unclear (Pillai, 1991; 1997).

Data for 1991 indicated that there were about 21,000 immigrant workers accounting for a mere 2.2 percent of total manufacturing employment (Table 1**)**.

Table 1 Immigrant labour in manufacturing, 1991-2010 (selected years)

Year	Immigrants in manufacturing	% of manufacturing work force
1991	21,162	2.17
1995	142,380	10.25
1997	208,335	14.76
1999	179,427	13.21
2001	211,702	15.21
2003	271,444	18.06
2010	515,000	28.4

Source: 1991-2003 adapted from Narayanan and Lai (2012)
2010 share was based on total employment from Department of Statistics (2011:14) and the number of immigrants in manufacturing as stated in World Bank (2013: 24)

By 1995, their share had increased to 10.3 per cent. Even during 1997-1999, a period that felt the impact of the Asian financial crisis, immigrants accounted for between 13-14 percent of the manufacturing work force. Immigrant labour grew significantly in the new millennium due to the rapid expansion of the export-oriented sector. By 2010, despite the retrenchments during 2008-2009 in response to the global recession, and other short lived bans and freezes on foreign labour, some 515,000 were still employed in manufacturing.[3] They comprised 28.4 percent of the sector's workforce.

Within manufacturing, immigrant workers were distributed in three major subsectors: wood and wood-based products, electrical and electronics (EE) subsector and textiles and wearing apparel (Table 2).

[3] See Devadason and Chan (2014) for details on the stops, starts and U-turns that marked Malaysia's policies on immigrant labour.

Table 2 Distribution of Immigrants across manufacturing subsectors, 1991and 2003

	1991		2003	
Subsector	Immigrants	% of total	Immigrants	% of total
Food manufacturing	2,171	10.26	17,126	6.31
Textile & apparel	412	1.95	33,032	12.17
Plastic products	185	0.87	21,615	7.96
Rubber products	265	1.25	15,054	5.55
Wood products	12,466	58.91	73,111	26.93
Electrical & Electronics	1,455	6.88	51,518	18.98
Other	4,208	19.88	59,989	22.10
Total	21,162	100.0	271,444	100.0

Source: Narayanan and Lai (2012)

In 2003, more than 58 per cent of the immigrant workers in the manufacturing sector were located in these activities. More importantly, by 2003 the EE subsector that dominates manufacturing in terms of all the major measures of output, value added, export and employment, emerged as the second largest employer of immigrant workers in manufacturing (with over 51,500 workers), after wood and wood-based products

Relative to the wood and wood-based as well as the textiles and wearing apparel subsectors, which are highly labour-intensive and are thus heavily reliant on immigrant labour, the EE subsector encompasses more diverse methods of production, ranging from labour-intensive production operations and assembly to technology-intensive processes such as wafer fabrication. Immigrant workers in the EE subsector, however, manned the routine production operations and assembly work.

Despite the lack of data to trace the patterns of immigrant labour use in the various manufacturing subsectors after 2003, it is evident that immigrants continued to dominate in these same subsectors in the later periods (cited in World Bank, 2013: 28).[4]

IMPACT OF IMMIGRANT LABOUR IN MANUFACTURING

A Brief Analytical Perspective

Immigrants can either complement or compete with native workers in an economy or in a a specific sector. A complementary relationship promises mutual benefits; better jobs and higher incomes for the immigrants (relative to jobs and earnings in their home economy) and higher growth, more jobs and rising incomes for natives in the host economy as immigrant presence eases labour constraints to growth and enlarges aggregate demand for goods and services. This view predicts income and job multiplier effects emanating from immigrant activity in the host economy or a given sector. The United Arab Emirates is a unique, if extreme example, where unskilled foreigners (who form 89 percent of the labour force) do not compete with the wealthy Arab natives but contribute in positive ways to the economy (Baruah, 2013).

If immigrants are good substitutes for natives, on the other hand, competition between the two could deprive natives of jobs and restrain the growth of their earnings, even when overall growth is seemingly unaffected. Here growth would be at the expense of natives. Immigrant activity disadvantages natives when their numbers exceed demand

[4] After 2003, *the Annual Survey of Manufacturing Industries* data published by Department of Statistics no longer distinguishes between native and immigrant workers.

and force wages downwards or at least restrain wage growth. Immigrants also displace natives when they prove willing to accept lower wages or less favourable terms of employment at prevailing wages.

Three Concerns

With respect to Malaysian manufacturing, the prevailing view was that the relaxed policy on low-skilled immigrant labour helped manufacturing expand in terms of output and employment, especially in the aftermath of the recession of the 1980s, but may have had deleterious effects on native workers. More specifically, we discuss three concerns regarding the downside of this heavy reliance on foreign workers: first, were foreign workers complements or substitutes to natives in manufacturing? Second, did immigrant presence have a depressing impact on wages in manufacturing in general, and the wages of unskilled workers in particular? Finally, did immigrant labour dampen productivity growth in the sector? We provide some tentative findings.

Immigrant workers: substitutes or complements?

The first concern is whether or not immigrants took away jobs from native workers; that is, were they substitutes for natives? The evidence has been mixed in different country contexts; some studies report that migrants have complemented natives (for example, Venturini, 1999; Carington & De Lima, 1996) or that the impact of displacing natives was negligible (Friedburg & Hunt, 1995); others hold that immigrants do indeed displace natives (Winter-Ebner & Zweimuller, 1999; Periera, 2010). In some cases, immigrants

have been found to complement natives in times of higher labour demand and become substitutes for them only during economic downswings (Lee and Wu, 1992).

The export-oriented manufacturing sector experienced unprecedented growth after it recovered from the recession of the mid-eighties, with output growing at nearly 12 per cent per annum in the two periods, 1986-1990 and 1991-1995. The consequent increase in labour demand is evident from the employment growth of 9.4 per cent and 5.9 per cent per annum, respectively (Table 3).

Table 3 Output, employment and wage rate growth, 1986-2010

	Growth (%)		
Period	Real Output	Employment	Real Wage
1986-90	11.6	9.4	-1.1
1991-95	11.6	5.9	4.2
1996-00	8.3	3.6	3.7
2001-05	4.2	4.6	1.6
2006-10	2.4	3.1	1.6

Source: 1986-2000 adapted from Narayanan and Lai (2012)
2001-2010 computed from data in Ministry of Finance (various issues)
Notes: Wages deflated by CPI (2000=100)

However, real wage rate growth during 1986-1990 actually fell by 1.1 per cent per annum; this isconsistent with the fact that immigrant labour usewas not yet legalized and employers could pay them lower wages. Real wage growth only recovered (to 4.2 per cent per annum) during 1991-1995 that coincided with the period when immigrants were

legalized and received the same wages as natives. These findings appear to support claims that immigrant labour use had thwarted wage rate growth during the earlier period of high labour demand (Pillai, 1991) Thus, the available data are consistent with the view that immigrant labour complemented natives because there was a "shortage" of the latter at *the prevailing wage levels* and wage adjustments that could have attracted local workers from other sectors had failed to materialize because immigrant labour was permitted.

In the later period (1996-2000), when real wage growth was being sustained by legislation guaranteeing equal wages for immigrants and natives, the former became the preferred choice. This was not on account of a cost advantage (for legally there were none), but because they were less particular about working overtime during holidays, avoided taking extended breaks during festive seasons and were available as contract workers thereby reducing overheads. They also lent flexibility to the operations of firms facing volatile demand conditions since they could be laid off easily during a demand downswing (see also Periera, 2010)[5]. This suggests that immigrant labour substituted for natives in subsequent periods. The much lower rate of wage grow in the post-2000 period is may well be a reflection of the reality that legally permitted immigrants unskilled workers had displaced natives in large numbers.

The speed at which the immigrant workforce redistributed and concentrated in the manufacturing sector lend support to this conclusion. For example, data based on the Labour Force Surveys (reproduced in Narayanan and Lai, 2007: 9) indicated that in 1985,

[5] Similar observations are also reported by Devadason and Chan (2014: 22-23) and World Bank (2013: 104)

only 6.9 per cent of all immigrant workers were engaged in manufacturing relative to 15.3 per cent of natives. By 2004 the proportion of immigrant workers in manufacturing had risen to 22 per cent and overtaken the 20 per cent share of natives. Furthermore, the proportion of the immigrants in manufacturing exceeded their share in construction (11.8 per cent) — a sector traditionally shunned by Malaysian workers. By the end of 2012, the picture remained largely unchanged; 39 percent of all immigrant workers were located in manufacturing, 29 percent in agriculture and 14 percent in construction (Bank Negara Malaysia, 2013: 23). Thus, the manufacturing sector remains the most reliant on immigrants.

Other evidence appears consistent with the view that foreign labour displaced natives in this sector. In an econometric exercise conducted by the World Bank (2013:44), for a time period that is not exactly clear in the source document, it was found that for every one thousand foreigners employed in agriculture and mining, 671 new jobs were created for Malaysians. In services, the comparable figure was 741 additional jobs for natives. However, the effect in manufacturing was much smaller and not statistically significant. Thus, immigrant labour generated the largest complementary demand for local labour in services and agriculture but virtually none in manufacturing. Even so, the 'pure employment multiplier' effect was less than one in both agriculture and mining and services.[6] These findings seem to suggest that the small positive effects of employing

[6] It further noted that the elasticities of native employment with respect to immigrant employment in agriculture and mining, manufacturing and services were 0.15, 0.02 and 0.05, respectively. All are considerably lower than 1 and the elasticity for manufacturing is presumably not statistically significant. This would suggest that a 100 percent increase of immigrants would result in a 15 per

immigrants were all felt in sectors that were of lower appeal to Malaysians, where immigrants played a complementary role, but not in manufacturing where they presumably were closer substitutes to natives in the types of jobs they performed.

To the extent that immigrants were largely low or unskilled, as substitutes, they most likely displaced the low or unskilled natives in manufacturing or elsewhere. The World Bank study (2013: 48) confirms this point though the impact was estimated for the economy as a whole and not the manufacturing sector in particular. Engaging 100 new foreign workers would leave 114 natives with primary education or less without jobs, while new jobs will be created for natives with education ranging from lower secondary to STPM level. Even so, the study appears to suggest that the benefits to better educated workers were not apparent in manufacturing: "The results give a clear indication that the main beneficiaries of immigration in Malaysia are older workers with medium education levels who work in low-skill intensive *service and agriculture and mining sectors*" (World Bank, 2013: 51; emphasis added).

On the flip side, foreign workers, as a group, bore the brunt of unemployment during recessions. Unemployment remained low and stable during the global recession in 2008-2009 because immigrant workers were the first to be laid off (*The Edge*, 13 October 2009). In January 2009, the Malaysian government stopped the hiring of immigrant workers in manufacturing and made it clear that firms should terminate immigrant workers first (MPI, 2009). The World Bank (2009a) noted that during the crisis, about 120,000 workers, the majority of them immigrant, were retrenched in the manufacturing

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cent increase in jobs for natives in agriculture and mining and a mere 5 pere cent addition to jobs for natives in services.

sector. Immigrant labour therefore helped cushion the impact of mass unemployment and helped avert major socio-economic dislocations in the economy.

Impact on wages

Again findings in the literature are not unanimous on the impact of immigrants on the wages of natives of the same skill level. Friedberg & Hunt (1995) and Borjas (2005) report what they considered was only a small (negative) impact on wages in the US while Venturini (1999) reported a positive impact on native wages in Italy because immigrants played a complementary role to natives.

Within the Malaysian context, the negative impact of immigrant workers on wages is often greatest when employers of immigrants can avoid paying immigrants wages equivalent to those of natives doing similar jobs. Indeed, as evident from Table 3, over the period 1986 to 1990, when immigrant labour use in manufacturing was not yet legalized and there was no legislation requiring them to be treated equally as natives, the growth of real wage rate was negative. The (then) widespread practice of paying immigrant workers lower rates of compensation almost certainly accounted for the negative wage rate growth, although the barring of national unions in the electronics subsector may also have been a contributory factor.[7]

[7] Workers in electronics — the largest and most dynamic subsector in manufacturing— were forbidden from joining or forming national unions. Instead only in-house unions were allowed. These were small and weak (Koshy, 2010).

The formal decision to allow the use of immigrant labour in manufacturing in 1991 also made it illegal to offer different rates of compensation and benefits to natives and immigrant workers. Thus, an employer was unlikely to legally obtain a significant cost saving by opting for immigrants in subsequent periods though they may still be preferred for other reasons noted earlier. During 1991-95, both employment and real wage rates grew at health rates.

However, the unimpeded supply of immigrant labour to the manufacturing sector in the post 1995 period appears to have dampened the overall wage rate growth in manufacturing.. The data (in Table 3) show that the annual average growth of real wage rate in the manufacturing sector as a whole decreased from 3.7 per cent between 1996 - 2000, to 1.6 per cent between 2001-2010, a period that saw the free inflow of legalized immigrant workers.

To examine this issue further, we tested a wage determination model based on the 'eclectic' formulation used by Athukorala and Devadason (2012). However, our attempt differs from the latter in both the estimation objective and the data set used. While they estimated the determinants of differential *inter-industry wages* using an industry-wide panel data set (for 2000-2008), our model focused on the determination of *inter-firm differences* in wages using plant-level data for year 2006. It was interesting to see if the findings from the two different estimation procedures were consistent with one another.

The model was specified as follows:

$$WG = \beta_0 + \beta_1 FW + \beta_2 SA + \beta_3 KL + \beta_4 SK + \beta_5 SIZE + \beta_6 FOR + \beta_7 EX + \beta_8 MC + \beta_9 UN + \varepsilon$$

where

WG average wage per worker

(WG1 average wage per unskilled worker)

FW share of immigrant workers in a firm's full-time workforce

(FW1 share of unskilled immigrant workers in a firm's full-time unskilled work force)

SA total sales

KL capital (fixed assets)-labour ratio

SK skill intensity (ratio of managerial and professional workers in a firm's full-time work force)

SIZE number of full-time workers

FOR share of foreign ownership of firms

EX share of exports in sales

MCR market concentration ratio (share of 4 largest plants in the total output of each sub-sector)

UN share of workers who are union members

Plant-level data were obtained from *the Productivity and Investment Climate Survey 2*—a nationally representative survey that covered establishments in the manufacturing sector[8]. Two separate estimations were made: the first had WG (for all

[8] The survey was undertaken by Economic Planning Unit of the Prime Minister's Department, the Malaysian Department of Statistics and the World Bank in 2007 with data for the reference year 2006. The total sample covered 1,200 manufacturing firms though the information was not always complete for all establishments. To our knowledge this is the only plant level data available. For more details on the survey, see World Bank (2009 b). We are grateful to Seyed Mehrshad Parvin Hosseini, a doctoral candidate in Economics at Universiti Sains Malaysia, for allowing us to use the data and assisting with the estimation. He obtained access to the data from the World Bank.

workers) as the dependent variable (and the corresponding variable FW on the right-hand side) and the other had WG1 (for unskilled workers only) as the dependent variable (and the corresponding variable FW1 on the right-hand side). The variables *WG (WG1), SA, KL* and *SIZE* were expressed in logarithmic form while *FW (FW1), SK, FOR, EX, MCR* and *UN* were all expressed in percentages. The variables were checked for multicollinearity using VIF (variance inflation factor) and simple correlation coefficients. Results (available on request) indicated that there were no serious multicollinearity problems that could distort the significance of the estimated coefficients.

Of primary interest was the impact of the presence immigrant workers on wages; this is captured by the coefficient of *FW* (*FW1*). *A priori*, it is uncertain whether this coefficient will be positive or negative. A positive coefficient would indicate that immigrant workers do not depress wages and immigrants actually complement natives. Conversely, a negative coefficient would imply that they depress wage growth and might be taking away jobs from natives.

The others are control variables. *SA* (the value of total sales) captures the derived demand for labour. An expansion in output increases the demand for labour, and, assuming labour supply is unchanged, may be expected to increase wages. Capital intensity *(KL*), similarly, was expected to raise labour productivity and efficiency and thereby increase wages. Skill intensity (*SK*) was also assumed to have a positive effect on wages as a firm with a higher proportion of skilled workers would likely be involved in higher value added activities and therefore pay higher average wages. *SIZE* (size of firm's workforce) was included on the basis of the commonly held belief that the size of the workforce reflects firm size; if correct, it would suggest that larger firms, with more

resources at their command, will likely pay higher wages to attract better workers and to enhance worker satisfaction

Similarly, *FOR* (degree of foreign equity ownership) was included because there is a large body of studies that suggest that foreign-owned firms tend to have more attractive remuneration packages compared to domestic-owned firms (Fukasei, 2013; Malchow-Møller, et al., 2013; Heyman, et al., 2007; Martins, 2004). *EX* (share of exports in total sales), on the other hand, is expected to have a negative impact on wages because export-oriented manufacturing firms in Malaysia are generally engaged in labour-intensive production and, therefore, tend to keep their wages low to remain competitive in the export market (cited in World Bank, 2013: 28-29). The impact of *MCR* (market concentration ratio) on wages is ambiguous, *a priori*; greater market power of monopolistic firms enables them to control both output and input prices, and thus negotiate for lower wages in hiring workers; on the other hand, these firms are also better able to attract and retain workers by offering relatively higher wages (Belman, 2004; Landon, 1970). Finally, *TU* (percentage of workers who belonged to trade union) attempts to capture the impact of in-house unions that predominate in the EE sectors. We expected this to have a positive effect on wages.

The results of the estimated models for both all workers and unskilled workers are given in Table 4. It is evident from the table that except for firm size (*SIZE*) the signs of the estimated coefficients conform to expectations and most are significant.

Table 4 Determination of firm level wages in the manufacturing sector

Variables	All workers *WG*	Unskilled workers *WG1*
C	6.72151***	6.1334***
	(0.24376)	(0.38851)
FW	-0.00253***	
	(0.00081)	
FW1		-0.00456***
		(0.00102)
SA	0.18748***	0.25887***
	(0.02506)	(0.03390)
KL	0.02344*	0.02501
	(0.01317)	(0.01915)
SK	0.01279***	0.03428***
	(0.00217)	(0.00430)
SIZE	-0.13859***	-0.17602***
	(0.03474)	(0.05065)
FOR	0.00102**	0.00201**
	(0.00052)	(0.00097)
EX	0.00010	-0.00030
	(0.00052)	(0.0093)
MCR	0.00169	0.00378*
	(0.00117)	(0.00199)
UN	0.00176	0.23376
	(0.06949)	(0.14724)
	N= 821	N=721
	F-statistic = 38.24	F-statistic = 29.71
	Prob >F = 0.0000	Prob >F =0.000
	R^2= 0.2724	R^2=0.2879

Note: Robust standard errors (in parentheses) were used for deriving the t ratios
*** significant at the 1%, level
** significant at the 5% level
* significant at the 10% level

Turning to the impact of immigrants on all wages, the elasticity of -0.060, implies that a 10 percent increase in the share of immigrant workers in total employment results in a 0.6 per cent decline in wages. The corresponding elasticity for unskilled workers was -0.123**;** a 10 per cent increase in the share of immigrant unskilled workers in total unskilled

workers results in a decline of 1.23 per cent in the wages of unskilled workers[9]. These findings are not only consistent with those of Athukorala and Devadason (2012) but are remarkably close to their elasticity estimates.[10]

Table 5 Descriptive statistics

Variables	Mean	Std.Dev.	Min	Max
WG	9.5912	0.6534	6.00368	13.6348
WG1	10.2852	1.0296	6.2913	15.4124
FW	23.8004	25.7544	0	100
FW1	27.0807	33.0929	0	100
SA	16.1196	1.9919	10.389	23.3774
KL	9.7996	1.7691	3.8258	16.8364
SK	12.8567	10.6448	0	100
SIZE	199.8658	471.8025	0	5711
FOR	22.5605	38.8196	0	100
EX	29.4645	37.7833	0	100
MCR	43.2497	16.5881	21.1215	79.7340
UN	4.8744	18.034	0	100

The results are therefore consistent with our view that the large presence of immigrant workers had a dampening effect on wages of workers in manufacturing, as a whole, and on the wages of unskilled workers in particular. The relatively small impact corroborates our belief that while the easy availability of legalized foreign labour slowed

[9] Given that the left-hand side variables are in logs and the variables, *FW (FW1), SK, FOR, EX, MCR* and *UN* are percentage shares, the relevant elasticity figures were derived by multiplying the estimated coefficients of these variables by their respective mean values (see Table 5). In the case of *SA, KL* and *SIZE* which are in logs, their coefficients can be interpreted directly from Table 4.

[10] They found that real wages in an industry declines by 0.67 per cent when the share of immigrants in the total employment increases by 10 per cent. On the other hand, a10 per cent increase in the share of immigrant unskilled workers in the unskilled workforce of an industry decreases real wages of unskilled workers by 1.3 per cent.

down real wage rate growth in the sector, other factors—including a rapidly rising demand for unskilled labour— ensured that wage rate growth was not negative. If sales expansion captures this rising demand for unskilled labour, the results suggest that a 10 per cent increase in sales would boost wages by 2.6 per cent.

Other factors impacting significantly on the wages of unskilled labour were *SK*, *MCR* and *FOR*. Unskilled workers in firms requiring higher skilled workers (as measured by *SK*) and presumably engaged in higher value added activities were better off. A 10 per cent increase in skill intensity raises wages by 4.4 per cent. An increase in market concentration by the same magnitude raised wages by 1.6 per cent. Foreign ownership had only a small, though significant and positive effect on wages of unskilled labour; a 10 per cent increase in foreign equity ownership raised wages but only by 0.45 per cent. Thus, firm structure and performance were also important factors in determining wages along with the size of immigrant workers (Athukorala and Devadason, 2012).

Of the remaining control variables, capital intensity (*KL*), export orientation (*EX*) and trade union membership (*TU*) had the expected signs but were not statistically significant. Clearly, in-house unions had a negligible effect on both wages of unskilled and all workers.

Interestingly, the coefficient of *SIZE* was significant but had a negative sign in both estimates; one explanation is that once all other factors are controlled for, firms with a big workforce are likely to pay lower than average wages. For example, a 10 per cent increase in size of the workforce decreases wages of unskilled workers by 1.7 per cent. The observation that larger firms pay higher wages is therefore more a reflection of the

kind of activities they are engaged in, the demand for their output, the structure of the markets they operate in and the value added in their activities, rather than their size alone.

Bearing in mind that the wage levels of unskilled workers were low to begin with, the reduction of real wage rate growth of 1.2 or 1.3 per cent would set them back more seriously than indicated by the small magnitude of change. We therefore conclude that the influx of immigrants negatively impacted on the wage growth of the lowest paid workers—a group that might have benefited the most from wage increases no matter how small.

Capital use and productivity

In general, severe labour scarcity impels industry to switch from labour using to more capital using technologies, provided labour costs rise. And, *ceteris paribus*, greater capital intensity boosts productivity growth.

In manufacturing, there was a seeming contradiction to this scenario (Table 6). The growth of productivity per worker was low in the periods when immigrants were used illegally in the sector. It recorded impressive growth when immigrants were legalized and complemented the natives in manufacturing (till about 1999). But productivity growth has been falling since 2000 and this appears consistent with the rising share of low and unskilled immigrant workers in manufacturing during this period. However, K/L ratio has been rising consistently till 2005, after which a small dip is seen. One possible explanation is that the easy availability of labour encouraged employers to sustain output increases through the use of *more capital equipment that needed labour* (labour–using technologies) rather than opting for technologies that substituted labour

(capital-using technologies). Lewis (2005), for example, found evidence consistent with this view in his study of plant level data in the US for the years 1988-1993. He noted that the skills available to employers drive the spread of skill-complementary technologies. A large supply of unskilled immigrant labour therefore results in the adoption of technologies consistent with lower skilled labour. Consequently, although output and capital-labour ratio increased, productivity growth slowed down.

An earlier study by Tham and Liew (2004: 271), using Malaysian manufacturing data for the 1991-96 period, corroborates this finding. It reported that a one unit increase in the ratio of immigrant labour to total labour in manufacturing lowered value added per worker by RM864.

Table 6 Share of immigrants, capital-labour ratio and productivity growth, 1985-2010

Period	Average share of immigrants in manufacturing (%)	Output per worker (RM)	K/L ratio (RM per worker)	Annual growth of real value added per worker (%)
1985-89	1.61	56,942	43,045	2.7
1990-94	4.49	140,777	57,373	4.0
1995-99	13.1	299,776	87,870	7.1
2000-04	16.57	482,239	115,924	3.3
2005-10	24.6	748,821	112,162	2.0

Sources: Computed from DOS (various issues) and World Bank (2013)

Notes: K/L ratio proxied by ratio of fixed assets to employment
Value added/worker deflated by PPI (1989=100)

CONCLUSIONS AND POLICY DIRECTIONS

Three main concerns arising from the use of immigrant labour in Malaysian manufacturing were examined Our evidence is consistent with the view that foreign workers complemented natives in the initial period when a sudden labour shortage surfaced in the sector, at wage levels that were prevailing then. In later periods, when wage levels continued to rise, albeit more slowly than they might have, immigrant labour displaced local workers because employers preferred them in order to reduce non-wage costs. There was also evidence to suggest that the influx of immigrant labour undermined the growth of real wages of all workers, and more significantly, the wages of unskilled workers. Similarly, our data corroborates the view that immigrant presence may have thwarted productivity growth.

A recent study by the World Bank (2013) on the impact of immigrant labour highlights the benefits they have undoubtedly brought to the economy as a whole. However, a careful scrutiny of the report suggests that the positive benefits from immigrant labour emanated largely from outside manufacturing. In sectors like agriculture and mining, construction and non-domestic services, where unskilled immigrants clearly complemented better skilled native workers by doing tasks that the latter were reluctant to do, returns to both native labour and capital had increased. Much of the benefits from immigrant presence accrued to native groups with medium-levels of education and not to those with poor or no education. More importantly, the findings with respect to positive gains in manufacturing were more ambiguous.

Clearly, the reliance on unskilled immigrant labour in manufacturing helped output expand, despite a slowing down of productivity growth, throughout the period under review. But this was not without costs; foreign workers competed directly with unskilled natives who are part of an already economically disadvantaged group. This competition not only denied unskilled native workers of job opportunities in manufacturing but also slowed down the growth of the real wages of all unskilled workers. While the dampening effect of immigrants on the wages of unskilled workers appeared small, it was statistically significant. Since wages of unskilled workers were low to begin with, any restriction on wage growth, no matter how small, would have set them back more seriously than the figures suggest. These are also groups that do not have adequate protection from established social security nets[11].

While foreign unskilled workers may always be needed to replace natives who, through education and skill development, prefer jobs higher up the occupational hierarchy, it is important to monitor and manage the inflows to minimize the negative effects they have on the livelihoods of natives still stuck in such jobs. Thus, allowing more immigrants to legally enter the country must be coupled with effective enforcement and monitoring mechanisms to ensure that their large numbers do not crowd out natives still dependant on low skill jobs. Clear policies, along with effective monitoring and enforcement mechanisms, will also reduce the number of irregular immigrants.

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[11] The reliance on immigrants, their large presence in low paying jobs and the consequent slower growth of wages in these jobs appear to have made these openings less attractive to a new generation of Malaysian job seekers, even poorly educated ones.

The current think on regulating the inflow of immigrants has focused largely on raising the cost of using immigrants by equalizing the wages and benefits paid to immigrant and native workers, and by attempting to impose ceilings and raising levies on foreign workers. Whatever effect these measures may have on reducing the flow of regular immigrant workers, they will also have the unintended consequence of encouraging the use of irregular immigrants by employers, if pushed too far.

Immigrants respond as much to the job opportunities in the host economy as the lack of employment at home. Thus, there is another neglected aspect that needs attention if the inflow of unskilled foreign workers is to be reduced in the longer term. Strengthening policies that increase investments, enhance productivity and generate high growth and high income jobs will naturally reduce opportunities for unskilled immigrants and help to ebb their flow. Investments in education and skill enhancement among natives will not only support such growth policies but will also provide some measure of immunity from competition from unskilled foreign workers. As the economy's growth generates opportunities for skilled and professional labour, the stream of unskilled immigrant workers will also be reduced to a useful trickle.

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