Wage Differentials between Foreign Multinationals and Local Plants and Worker Quality in Malaysian Manufacturing

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Using industrial census data for 2000, and smaller sets of survey data for 2001–2004, this paper examines the extent of wage differentials between medium-large (20 or more workers) foreign multinational enterprises (MNEs) and local plants in Malaysia's manufacturing industries. On average, wages in sample MNEs were higher than in local plants by two-fifths or more. In addition to being more capital-intensive and relatively large, MNEs also hired higher shares of workers in highly paid occupations and with moderate or high education. Results from large samples of 17 manufacturing industries combined suggest that statistically significant MNE–local differentials of 5%–9% persisted even after accounting for differences in worker occupation, education, and sex, plant capital intensity and size, as well as the influences of yearly fluctuations, industry affiliation, and plant location on the constants estimated. When MNE–local differentials and all slopes are allowed to vary among the 17 industries, positive and significant differentials were observed in all estimates for six industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. Positive and significant differentials were also observed in most estimates for another five industries. However, the size and significance of these differentials often varied depending on the industry and sample examined, as well as the estimation technique used.

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I. Introduction

There is now substantial evidence that foreign multinational enterprises (MNEs) tend to pay wages that exceed those of corresponding local firms or plants. There is also evidence that positive MNE–local wage differentials persist even after

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controlling for related differences between foreign MNEs and local firms or plants (e.g., differences in factor intensity, size, industry affiliation, and location). However, most previous studies of MNE–local wage differentials have been unable to account for the fact that MNEs tend to hire higher quality workers than local firms or plants. Lipsey and Sjöholm's (2004a) study of Indonesian plants in 1996, which finds that MNE–local differentials persist even after accounting for worker education, is the major exception. Moreover, aside from limited evidence in studies by Lim (1977) and Lee and Nagaraj (1995), and the descriptive statistics presented in Ramstetter (1995, 1999) and Ramstetter and Haji Ahmad (2011), there is very little evidence regarding MNE–local wage differentials in Malaysia.[1]

The Malaysian case is important because MNEs have been heavily involved in the manufacturing sector for many decades and Malaysian data include information on worker occupation in addition to worker education, which allows for more complete measurement of worker quality than in the Indonesian case. Data constraints have been an important reason for this important gap in the literature. This paper begins to fill that gap by using plant-level data from Malaysia's manufacturing census for 2000 and related surveys for 2001–2004 that allow for examination of MNE–local wage differentials after accounting for two important aspects of labor quality, educational background, and occupation.

The paper begins with a short literature review and a description of methodologies used to examine the question of whether MNEs pay higher or lower wages than their local counterparts (Section II), before examining the data and some descriptive statistics (Section III). Results of estimating Mincer-type equations, which reveal the extent of wage differentials after accounting for differences in labor force quality and other related plant characteristics, are then analyzed (Section IV). Finally, some conclusions and suggestions for future research are offered (Section V).

II. Literature Review and Methodology

Lipsey and Sjöholm's (2004a) study of manufacturing plants in Indonesia in 1996 is perhaps the most sophisticated study of MNE–local wage differentials and their relationship to labor quality available for host, developing economies.[2] They estimate Mincer-type equations for white-collar and blue-collar workers by industry and account for the influence of worker educational background, the share of female workers, as well as other plant-level characteristics related to wages (size, energy per worker, inputs per worker). They found that MNEs paid higher wages than local

[1] With the exception of Lee and Nagaraj's (1995) analysis of a limited sample of workers in the Klang Valley, which focused on male–female differentials, previous studies of Malaysia do not analyze MNE–local wage differentials.

[2] These authors also examine other aspects of wage differentials and how they change over time in Lipsey and Sjöholm (2004b, 2005, 2006) and Sjöholm and Lipsey (2006).

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plants and that statistically significant wage differentials persisted after accounting for the educational background of the plant's work force and the other plant-level characteristics.

Ramstetter and Phan (2007) also found that positive wage differentials between MNEs and local, private firms in Viet Nam persisted after accounting for firm size, factor intensity, shares of technical workers, and shares of females in the firm's workforce. In contrast, results from Lee and Nagaraj's (1995) sample of workers in the Klang Valley of Malaysia in 1991 suggest that foreign ownership of a plant had no significant effects on wages of either male or female workers, after accounting for the influences of several measures of labor quality (education, experience, occupation, training) and numerous other worker-level and plant-level variables.[3]

Other studies of Malaysia (Lim 1977), Thailand (Movshuk and Matsuoka-Movshuk 2006, Ramstetter 2004), and Venezuela and Mexico (Aitken et al. 1996) have found that MNE–local wage differentials tended to persist after accounting for similar plant-level or firm-level characteristics, but were unable to account for the influences of labor force quality. In addition, Ismail and Haji Mat Zin (2003) and similar studies of workers in other economies reveal significant returns to human capital when measured by worker education, training, and experience, for example. Thus, there is substantial evidence that both plant ownership and worker quality have important influences on worker earnings. It is clear that relatively well-educated, experienced, and well-trained workers generally expect relatively high returns to their work efforts. Firms or plants hiring high-quality workers usually expect relatively high productivity from them and offer commensurate compensation.

The primary reason that MNEs pay higher wages than local plants is probably the well-documented tendency for MNEs to be relatively technology-intensive or skill-intensive compared to non-MNEs (Caves 2007, Dunning 1993, Markusen 2002). However, even relatively sophisticated studies like Lipsey and Sjöholm (2004a) probably fail to fully account for MNE–local differences in skill intensity. For example, in addition to differences in worker education, there may be important differences in worker occupation, training, background, and experience that are often accounted for in studies of wage determination among individuals. In this study of Malaysia, for example, it is possible to account for differences in education and occupation, but the available data do not contain information on worker background (e.g., race, nationality), training, or experience.

Other reasons for MNE–local differentials are perhaps less clear, but there are at least three important possibilities. First, there is substantial evidence that MNEs often find it difficult to identify and retain suitably qualified workers. For example, in 1998, securing adequate quantity and quality of labor was the third most common of 27 possible problems for Japanese affiliates operating in the ASEAN-4 (the

[3] These variables were union membership, marital status, migration status, total hours worked, plant size, and plant export-orientation.

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four largest developing economies in the Association of Southeast Asian Nations, namely Indonesia, Malaysia, the Philippines, and Thailand), this problem being cited by 8.5% of these MNEs (METI Japan 2001, pp. 536–37).[4] Other surveys also indicated that securing labor supply was the third most frequently cited of 14 investment motives of Japanese affiliates in Malaysia, being cited by 11%–13% of these firms during 2000–2004 (Toyo Keizai, various years).[5] Correspondingly, many of the aforementioned studies suggest that MNEs may pay relatively high wages to secure or retain labor in economies like Malaysia.

Second, workers in host economies are often relatively familiar with management practices in local firms and may therefore be relatively reluctant to work for MNEs that often use less familiar management styles. This may lead them to demand a premium for working in the relatively unfamiliar MNE environment. Unfortunately, there is relatively little empirical evidence on this point, though many of the studies reviewed above mention it. On the other hand, relatively recent surveys of Malaysian university graduates suggest that MNEs are actually among the more popular employers for educated workers in this economy.[6]

Third, MNEs are often hypothesized to have important firm-specific assets in relatively large amounts compared to non-MNEs.[7] These firm-specific assets are generally intangible, and many of them are related to worker quality. However, even when an MNE's intangible assets are not directly related to worker skills, they may facilitate higher worker productivity by improving a firm's marketing and management, for example. In other words, the MNE's possession of firm-specific assets has the potential to make workers more productive in MNEs than in non-MNEs, even if labor quality is identical in MNEs and non-MNEs. In such cases, MNEs may find it profitable to pay relatively high wages to compensate for their relatively high productivity, especially when the ability to utilize firm-specific assets is related to workers' firm-specific experience or motivation, for example.

Partially reflecting differences in firm-specific assets, MNE–local wage differentials are thought to result from differences in other plant-level characteristics that might affect labor productivity and/or wages. For example, much of the literature reviewed above suggests that firms or plants that are relatively large or capital-intensive often pay relatively high wages and have relatively high labor

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[4]The most commonly cited problems were (i) competition for product markets (11.2%) and (ii) political instability (8.6%).

[5]The most commonly cited motives were (i) development of local markets and (ii) strengthening of international competitiveness, which were cited by 21%–31% of affiliates.

[6]For example, seven of the top 10 employers in 2008 were foreign companies in Malaysia (http://malaysias100.com/media/foreign-firms-the-favorite), referenced December 2013.

[7]Some theorists (especially Dunning 1993) view the possession of firm-specific assets or ownership advantages as a key necessary condition for a firm to become an MNE (in addition to internalization and location advantages). Other theorists (Buckley and Casson 1992, Casson 1987, Rugman 1980 and 1985) dispute this view, choosing instead to emphasize the role of internalization as the key distinguishing characteristic between MNEs compared to non-MNEs. However, the important point is that all agree that MNEs tend to possess these kinds of firm-specific assets in relatively large amounts.

productivity. In addition, location and industry affiliation are found to have important influences on the wage levels in firms or plants. Plants with relatively large shares of female workers often tend to pay relatively low average wages because females generally earn less than males, and Malaysia is no exception.[8]

Thus, this paper will follow the previous literature summarized above and estimate earnings equations that account for the influences of worker quality and gender, plant size, factor intensity, location, and industry affiliation, as well as ownership (MNE vs. local owners). Particular attention will be paid to labor quality, which can be measured in two ways with the data obtained. The industry dimension will also be carefully considered by the use of industry dummies in samples of all plants in 17 industries combined and by estimating separate equations for each industry (thereby allowing both intercepts and slopes to vary across industries).

III. Data and Descriptive Statistics

This study employs the micro data underlying Malaysia's census of manufacturing plant activity in 2000 (Department of Statistics 2002) and smaller surveys of stratified samples for 2001–2004 (Department of Statistics various years). If samples are limited to plants with viable basic data (i.e., positive values of paid workers, output, worker compensation, and fixed assets), there were 18,799 plants in the 2000 census, but corresponding samples included only 11,898 to 13,197 plants in 2001–2004 (Ramstetter 2013, Appendix Table 1c). Most of the difference between the census and survey samples results from the census' inclusion of small plants with limited production or employment. For example, if samples are limited to medium-large plants with 20 or more paid workers and viable basic data (positive output, worker compensation, and fixed assets), the 2000 census contained 8,540 plants and the subsequent surveys 7,406 to 7,581 plants. These medium-large plants accounted for 95%–97% of the paid workers (Table 1) and 97%–98% of the output (Ramstetter 2013, Appendix Table 1b) by all plants with viable basic data.

Three types of ownership are identified in these data: majority-local plants, 50-50 joint ventures, and majority-foreign plants. MNEs are thus defined rather narrowly as plants with foreign ownership shares of 50% or more.[9] MNEs are predominantly medium-large plants which differ from small, predominantly local plants in important ways.[10] Thus, it is more meaningful to limit analyses of MNE–local wage differentials to medium-large plants than to include all plants. In addition

[8]For evidence on Malaysia, see Chapman and Harding (1985), Lee and Nagaraj (1995), Milanovic (2006), and Schafgans (2000).

[9]This definition is narrower than usual because MNEs are usually defined as plants or firms with foreign ownership shares of 10% or more. Unfortunately, it is impossible to use the standard definition because the precise foreign ownership share is not collected.

[10]Medium-large plants accounted for 90%–95% of all MNE plants compared to only 41%–60% of local plants (Ramstetter 2013, Appendix Table 1c). Medium-large plants also accounted for 99.7% or more of the paid

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Table 1. **Number of Paid Workers in All Plants with Viable Data and MNE Shares**

	Paid Workers in All Plants (1,000s)					MNE Shares of Paid Workers (%)				
Industry	**2000**	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
Medium-large plants, 20+ workers	1,498	1,341	1,441	1,452	1,501	40	41	40	40	40
17 sample industries	1,397	1,246	1,339	1,352	1,393	41	42	41	41	42
Food and beverages	113.945	113.523	120.215	123.549	124.806	14	14	13	12	13
Textiles	44.005	39.219	43.427	37.962	36.242	48	47	50	43	45
Apparel	69.244	64.769	74.281	68.214	77.000	30	35	42	34	49
Wood products	123.493	112.469	108.890	111.324	114.278	14	15	15	17	17
Paper products	32.185	29.457	32.898	30.494	34.040	16	21	17	15	16
Chemicals	45.406	42.147	47.076	48.989	51.367	38	41	41	38	39
Rubber products	72.505	67.061	66.594	69.072	72.318	36	37	39	41	39
Plastics	91.455	82.441	98.369	101.143	100.176	23	24	28	30	31
Non-metallic mineral products	55.508	55.623	55.732	54.158	54.182	22	23	24	23	24
Basic metals	39.878	37.959	40.128	40.835	42.081	24	24	25	27	22
Fabricated metals	57.730	52.093	61.743	63.662	68.045	28	26	24	27	24
General machinery	46.561	45.091	45.420	44.943	51.062	52	47	41	38	40
Office, computing, and precision machinery	101.030	95.658	82.802	81.936	89.155	82	85	92	91	93
Electrical machinery	77.121	60.444	65.876	67.848	67.425	54	62	50	60	59
Radio, TV, and communication machinery	330.140	250.308	279.046	292.317	285.123	70	78	74	73	73
Motor vehicles	33.700	38.999	46.739	47.776	50.597	16	12	10	15	16
Furniture	63.286	59.226	69.289	67.987	75.369	20	18	17	14	14
7 excluded industries	101	94	103	100	107	20	21	19	16	21
Small plants, 1–19 workers	73	48	45	43	39	2	2	2	2	2

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets. Excluded industries are tobacco, leather and footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years).

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to making sample size more consistent over time and allowing more meaningful MNE–local comparisons, dropping small plants has the important advantage of removing most outliers from the samples.[11] The analysis also excludes seven relatively small industries with few MNEs, heterogeneous definitions, and/or heavy government regulation.[12]

workers (Table 1) and the output (Ramstetter 2013, Appendix Table 1b) of all MNEs, while corresponding shares for local plants were 93% or more.

[11] For example, in the entire 2000–2004 sample, there were 4,592 observations of plants paying extremely low average compensation per worker of less than RM100 (about $26) per year. However, only 20 medium-large plants reported similarly low wages.

[12] Five of these industries (tobacco, leather and footwear, petroleum products, other transport equipment, and recycling) had only a dozen or fewer medium-large MNE plants in at least 4 of the 5 years, two were heterogeneous and relatively small industries (other transport equipment and miscellaneous manufacturing), and one industry was closely regulated by the government (printing and publishing).

The 17 industries included in the sample consist of one combination of two 2-digit categories (office, computing, and precision machinery), three 3-digit categories (rubber, plastics, furniture), and 13 2-digit categories (the remaining industries in Table 1). The criteria for defining the 17 industries were: (i) inclusion of competing plants in the same industry (because there are many multi-product plants in Malaysia, definitions are rather broad); (ii) industry size measured in terms of paid workers or output, and (iii) insuring sufficient samples of MNEs and local plants in each industry to facilitate reasonable comparisons. These 17 industries employed the vast majority of the paid workers in medium-large plants with viable basic data (89%–91%, Table 1).

In 2001, paid employment in the 17 sample industries was 11% lower than in 2000, partially because coverage was lower in survey years than in the census year. However, most of the decline in 2001 probably resulted from the dot.com-related recession, which led to a sharp fall in real manufacturing GDP.[13] Its effects on the three electronics-related industries (office, computing, and precision machinery; electrical machinery; and radio, television, and communication machinery) were particularly large. In these three industries, paid employment declined by 101,881 workers, which was over two-thirds of the decline in all 17 industries (150,705 workers). These three industries accounted for about one-third or more of all paid employment in the 17 industries (36% in 2000, 32%–33% in other years) and are very important in Malaysia.

Radio, TV, and communication machinery was the largest of the 17 industries, employing 330,140 paid workers in 2000, 250,308 in 2001, and 270,046–292,317 in subsequent years (Table 1). MNEs accounted for 70%–78% of these workers and 82%–93% in office, computing, and precision machinery, which was another industry where maximum paid employment topped 100,000 (in 2000). Electrical machinery was a smaller employer (maximum 77,121) with relatively large MNE shares (54%–62%). However, in other industries with large paid employment (over 100,000 in at least one year), MNE shares were much smaller, 12%–14% in food and beverages, 14%–17% in wood, and 23%–31% in plastics. MNEs also played relatively large roles in several of the smaller industries examined in this study. For example, they accounted for 40% or more of the paid workers in at least one year in textiles, apparel, chemicals, rubber, and general machinery. In the 17 industries combined, MNEs accounted for just over two-fifths of paid employment (41%–42%), somewhat larger shares of manufacturing employment than in most of East Asia's large developing economies (Ramstetter 2012b).

MNEs generally paid higher wages, defined as compensation per worker (including payments in kind, social insurance payments, and other items), than local

[13] In 2001, real manufacturing GDP growth was –5.9% if measured at 1987 prices and –4.3% if measured at 2000 prices (Department of Statistics 2011b). This compares to 18% in 2000 (1987 prices), 4.3% (1987 prices) or 4.1% (2000 prices) in 2002, 8.6% (1987 prices) or 9.2% (2000 prices) in 2003, and 9.8% (1987 prices) or 9.6% (2000 prices) in 2004.

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Table 2. **Mean Annual Compensation per Paid Worker in Medium-Large MNEs and MNE-Local Differentials**

	MNEs (current ringgit/year)					MNE–Local Ratios				
Industry	**2000**	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
17 sample industries combined	23,205	25,128	25,987	27,092	27,910	1.407	1.464	1.451	1.440	1.432
Food and beverages	28,428	28,909	31,257	31,585	32,886	1.702	1.835	1.931	1.852	1.878
Textiles	19,341	20,210	20,166	20,366	19,744	1.307	1.263	1.239	1.218	1.118
Apparel	13,986	15,085	14,508	14,969	16,142	1.222	1.279	1.193	1.210	1.380
Wood products	15,390	15,853	15,986	15,274	16,006	1.177	1.150	1.120	1.035	1.037
Paper products	21,329	23,240	23,357	26,591	24,786	1.184	1.213	1.148	1.284	1.203
Chemicals	36,959	36,524	40,813	43,183	45,241	1.473	1.401	1.463	1.469	1.502
Rubber products	19,973	20,996	21,374	21,891	23,556	1.302	1.320	1.276	1.289	1.321
Plastics	19,187	21,252	22,820	23,429	23,020	1.217	1.272	1.307	1.290	1.157
Non-metallic mineral products	28,669	30,594	29,863	34,416	34,133	1.614	1.675	1.570	1.673	1.589
Basic metals	27,426	30,284	29,044	32,200	30,599	1.285	1.298	1.218	1.337	1.196
Fabricated metals	24,148	24,538	24,138	25,411	26,015	1.398	1.330	1.297	1.288	1.269
General machinery	29,093	32,604	34,257	37,092	36,321	1.409	1.417	1.435	1.552	1.467
Office, computing, and precision machinery	22,177	22,823	25,037	24,159	25,862	0.990	0.866	1.005	0.819	0.928
Electrical machinery	19,207	21,746	21,907	22,944	23,312	1.117	1.169	1.073	1.094	1.041
Radio, TV, and communication machinery	21,109	24,046	22,766	23,790	24,426	1.145	1.261	1.205	1.111	0.992
Motor vehicles	25,510	23,890	26,642	29,720	28,633	1.424	1.204	1.281	1.397	1.271
Furniture	15,141	16,507	16,839	18,530	18,455	1.188	1.263	1.180	1.307	1.247

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets. Excluded industries are tobacco, leather and footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years).

plants (Table 2).[14] If all 17 industries are combined, this definition of wages was an average of 41%–46% higher in MNEs than in local plants. However, there was a large variation in wage levels and MNE–local wage differentials among industries. MNE wages were highest in chemicals in all years and increased from just over RM36,000 (just under $1,000) in 2000–2001 to RM45,241 in 2004. MNEs also paid relatively high wages in general machinery, non-metallic mineral products, food and beverages, and basic metals. At the other end of the scale, MNE wages were lowest in apparel, wood, and furniture, ranging from just under RM14,000 to about RM18,500.

MNE–local differentials tended to be largest in the industries where MNEs paid relatively high wages: food and beverages (70%–93%), non-metallic mineral products (57%–68%), chemicals (40%–50%), and general machinery (41%–55%).

[14]In sample plants, narrowly defined wages accounted for an average of 82%–84% of total compensation, while payments in kind accounted for 5%–6%, social insurance payments for 8%, and other items for the remainder.

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On the other hand, negative differentials were only observed in office, computing, and precision machinery (2000–2001 and 2003–2004); and radio, TV, and communication machinery (2004). Wage differentials were positive but relatively small in electrical machinery and wood (4%–18%). MNE–local wage differentials were positive in 15 of the 17 industries in all years, exceeding 10% in the vast majority (14–16) of sample industries and 20% in a majority (10–13 industries).

Not surprisingly, similarly large variation across industries is observed in several measures of labor quality, measured either in terms of worker occupation or educational achievement, though variation of worker quality is less pronounced over time. If all 17 industries are combined, the mean share of paid workers in highly paid occupations, defined as management (including proprietors), professionals, and technicians, in paid workers, was 20% in MNEs in 2000 and 22%–23% thereafter (Table 3).[15] These shares were 28%–37% higher than in local plants (ratios of 1.28–1.37 in Table 3). Consistent with the notion that wages are closely related to labor quality, the industry distribution of shares of highly paid workers was similar to the industry distribution of wages. For example, in MNEs, the share of workers in highly paid occupations varied from 9%–10% in apparel, 9%–11% in wood, and 12%–17% in furniture to 27%–32% in general machinery, 23%–26% in food and beverages, 33%–36% in chemicals, and 26%–30% in basic metals. MNE–local differentials for shares of highly paid workers were positive (ratios in excess of 1) in all 17 industries in 2000, 14–15 industries in 2001–2003, and 11 industries in 2004. However, these differentials were generally smaller than corresponding wage differentials. Relatively large differentials exceeding 10% were observed in only 8 industries in 2004 and 11–13 industries in other years.

Combining all 17 industries, highly educated workers (those with some kind of tertiary education) accounted for 16% of all workers in MNEs in 2000 and this share rose to 19% in 2003–2004 (Table 4). Similar to shares of highly paid workers, shares of highly educated workers were highest in chemicals and general machinery (averaging 30%–31%), followed by non-metallic mineral products; radio, TV, and communication machinery; and basic metals. These shares were often substantially higher in MNEs than in local plants. If all 17 industries were combined, these differentials computed to 61% in 2000, 83%–90% in 2001–2003, and 71% in 2004. At the industry level, MNEs had higher shares in 12–15 of the 17 industries. Moreover, differentials exceeded 10% in 11–14 industries and 20% in 9–13 industries. In other words, MNEs clearly hired relatively large shares of highly educated workers compared to local plants.

MNEs also tended to hire relatively large shares of moderately educated workers (those who completed the Malaysian Education Certificate or SPM but

[15]Occupations that tended to be lowly paid were defined as clerics and related workers, elementary occupations, plant and machine operators, assemblers, and part-time workers.

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Table 3. **Mean Shares of Paid Workers with Highly Paid Occupations in Sample MNEs and MNE–Local Differentials**

	MNEs (% of paid workers)					MNE–Local Ratios				
Industry	**2000**	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
17 sample industries combined	20	22	22	23	22	1.369	1.338	1.282	1.360	1.276
Food and beverages	23	25	26	25	24	1.456	1.513	1.474	1.504	1.436
Textiles	17	19	19	19	16	1.150	1.205	1.061	1.128	0.978
Apparel	9	9	10	9	9	1.104	0.904	0.969	0.886	0.555
Wood products	11	10	11	9	10	1.022	0.949	0.908	0.856	0.932
Paper products	19	20	22	24	21	1.212	1.250	1.262	1.365	1.244
Chemicals	33	33	35	36	34	1.378	1.272	1.281	1.277	1.270
Rubber products	15	16	16	15	16	1.129	1.107	1.115	1.114	1.117
Plastics	19	22	20	20	18	1.286	1.234	1.137	1.221	1.036
Non-metallic mineral products	22	22	21	26	24	1.468	1.333	1.185	1.567	1.410
Basic metals	26	25	27	30	26	1.407	1.185	1.228	1.395	1.317
Fabricated metals	20	20	21	22	20	1.286	1.129	1.106	1.183	1.045
General machinery	27	29	30	32	31	1.401	1.505	1.295	1.450	1.329
Office, computing, and precision machinery	20	20	22	24	24	1.084	0.905	1.129	1.034	0.946
Electrical machinery	18	20	21	20	20	1.083	1.087	1.063	0.983	0.952
Radio, TV, and communication machinery	20	23	23	22	23	1.239	1.150	1.028	1.019	0.962
Motor vehicles	20	20	22	24	22	1.177	1.067	1.107	1.321	1.198
Furniture	12	12	13	17	13	1.080	1.096	1.111	1.353	1.028

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets. Excluded industries are tobacco, leather and footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling. Highly paid occupations are (i) proprietors, business partners, (ii) managers, professionals, executives, and (iii) technicians, professionals.

Source: Author's compilations from micro data underlying Department of Statistics (2002, various years).

did not continue to tertiary education, Table 5). If all 17 industries are combined, these workers accounted for just under two-fifths of all employees in MNEs, and these shares were 20%–37% higher than in local plants. The highest MNE shares were observed in motor vehicles; radio, TV, and communication machinery; office, computing, and precision machinery; paper products; and electrical machinery. In other words, MNEs were relatively large employers in the three electronics-related industries, and they also hired relatively large shares of moderately educated workers in these industries.

MNE–local differentials were again positive in most industries, 12 in 2000 and 15–16 industries in subsequent years. Differentials exceeded 10% in eight industries in 2000 and 11–13 industries in subsequent years. Thus, MNEs hired relatively large shares of both moderately and highly educated workers, and MNE–local differentials were substantially larger for highly educated worker shares than for moderately educated worker shares. Conversely, Tables 4 and 5 also make it clear that MNEs

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Table 4. **Mean Shares of All (Paid and Unpaid) Workers with High Education in Sample MNEs and MNE–Local Differentials**

	MNEs (% of all workers)					MNE–Local Ratios				
Industry	**2000**	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
17 sample industries combined	16	17	18	19	19	1.611	1.879	1.901	1.828	1.706
Food and beverages	17	17	19	19	19	2.113	2.435	2.658	2.563	2.370
Textiles	9	8	8	10	9	0.933	0.928	0.824	0.914	0.889
Apparel	5	5	5	5	4	1.068	1.271	1.030	0.956	0.629
Wood products	7	7	7	6	6	1.426	1.488	1.488	1.201	1.143
Paper products	16	15	17	18	16	1.312	1.424	1.442	1.368	1.225
Chemicals	28	29	31	32	34	1.517	1.677	1.626	1.582	1.557
Rubber products	11	10	9	10	10	1.200	1.283	1.129	1.074	1.139
Plastics	14	16	18	17	15	1.292	1.593	1.625	1.545	1.209
Non-metallic mineral products	19	19	19	25	21	2.000	2.288	2.203	2.797	2.029
Basic metals	18	17	18	20	18	1.268	1.337	1.426	1.464	1.269
Fabricated metals	16	16	17	18	18	1.258	1.578	1.762	1.694	1.643
General machinery	26	28	31	35	31	1.996	2.207	2.086	2.448	1.930
Office, computing, and precision machinery	16	15	16	19	21	0.975	0.712	0.820	0.695	0.731
Electrical machinery	14	17	18	17	17	0.973	1.288	1.233	0.972	0.969
Radio, TV, and communication machinery	16	19	18	18	20	1.048	1.234	1.026	0.983	0.953
Motor vehicles	15	14	19	20	18	1.182	1.124	1.340	1.548	1.375
Furniture	7	6	6	9	8	0.986	0.911	1.236	1.379	1.152

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets. Excluded industries are tobacco, leather and footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling. High education is defined as education beyond the Malaysian Education Certificate (SPM), an exam taken by all students in the fifth year of secondary school (i.e., some level of vocational school, college, university, or graduate school).
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years).

hired relatively small shares of workers who did not complete the SPM and are considered relatively unskilled in Malaysia.[16]

Information on the race of Malaysian workers and the number of and nationality of foreign workers are two other indicators potentially related to labor quality which were collected in the 2000 and 2005 censuses (and probably in the surveys for interim years).[17] Probably because this information is sensitive in Malaysia, it was not included in the data sets provided for this and related studies. The lack of information on foreign workers is probably of most consequence because the number of foreign workers in manufacturing plants rose rapidly during the period

[16]In all 17 industries combined, shares of workers not completing SPM were 48% for MNEs in 2000 and 42%–44% thereafter, or 20%–31% below corresponding shares in local plants.

[17]I have a copy of the survey form for the 2005 census and have been told that the same form was used in 2000–2004 by Malaysian officials.

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Table 5. **Mean Shares of All (Paid and Unpaid) Workers with Mid-level Education in Sample MNEs and MNE–Local Differentials**

	MNEs (% of paid & unpaid workers)					MNE–Local Ratios				
Industry	**2000**	**2001**	**2002**	**2003**	**2004**	**2000**	**2001**	**2002**	**2003**	**2004**
17 sample industries combined	36	39	39	39	39	1.201	1.369	1.355	1.341	1.283
Food and beverages	35	37	35	34	38	1.295	1.372	1.344	1.236	1.328
Textiles	32	34	40	36	38	1.075	1.013	1.219	1.134	1.137
Apparel	16	22	20	20	24	0.781	1.066	1.012	0.884	0.816
Wood products	17	22	21	22	21	0.921	1.180	1.083	1.162	1.100
Paper products	39	41	44	45	43	1.109	1.250	1.290	1.282	1.179
Chemicals	41	41	42	42	40	1.104	1.161	1.131	1.074	1.033
Rubber products	28	32	34	31	35	1.049	1.178	1.309	1.203	1.282
Plastics	35	42	41	40	38	1.024	1.316	1.337	1.332	1.181
Non-metallic mineral products	33	35	34	34	34	1.275	1.392	1.425	1.416	1.412
Basic metals	38	45	46	39	37	1.127	1.344	1.336	1.230	1.160
Fabricated metals	39	41	40	38	38	1.111	1.378	1.394	1.275	1.277
General machinery	39	41	40	40	40	1.104	1.085	1.098	1.088	1.044
Office, computing, and precision machinery	44	43	42	48	47	0.937	0.948	0.864	1.205	1.219
Electrical machinery	34	43	41	45	45	0.794	1.101	1.042	1.116	1.101
Radio, TV, and communication machinery	43	48	46	49	48	1.007	1.294	1.119	1.146	1.064
Motor vehicles	47	51	48	49	47	1.217	1.360	1.231	1.249	1.185
Furniture	20	24	20	24	21	0.711	1.015	0.877	0.992	0.809

Note: Plants with viable data are those with positive paid workers, output, worker compensation, and fixed assets. Excluded industries are tobacco, leather and footwear, publishing, petroleum products, other transport equipment, miscellaneous manufacturing, and recycling. Mid-level education is defined as successful completion of the Malaysian Education Certificate (SPM), an exam taken by all students in the fifth year of secondary school, but no further education.
Source: Author's compilations from micro data underlying Department of Statistics (2002, various years).

studied, from 219,633 or 14% of all manufacturing workers in 2000 to 366,095 or 22% of the total in 2005 (World Bank 2013, pp. 24 and 193).

Because foreign workers tend to be relatively unskilled and paid less than Malaysian nationals, MNE–local wage differentials may also be related to differences in foreign worker shares in MNEs and local plants. Many foreign workers are also known to work in the relatively labor-intensive, MNE-dominated electronics-related machinery industries (Bormann et al. 2010). However, I know of no published information on the extent to which shares of foreign workers differ between medium-large MNEs and local plants. Moreover, it is important to note that information on race, nationality, and sex of workers reflects both aspects of worker quality and the extent to which a group is discriminated against in the workplace or in educational institutions, for example.

In summary, these industry-level compilations suggest MNEs tend to pay relatively high wages, as well as hire relatively large portions of workers in

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high-paid occupations and with moderate or high education. Previous compilations also suggest that MNEs tend to be much larger and somewhat more capital-intensive than local plants during this period (Ramstetter and Haji Ahmad 2011). These differences can all explain at least part of the observed wage differentials between MNEs and local plants. It is thus of interest to examine whether wage differentials persist after accounting for these differences between MNEs and local plants.

IV. Results of Estimating Earnings Equations

Using a specification similar to that of Lipsey and Sjöholm (2004a), the extent to which MNE–local wage differentials persist after accounting for the influences of plant-level capital intensity and size, as well as worker occupation, education, and sex, can be investigated by including a dummy variable identifying MNE plants in a typical earnings equation such as the following:

$$LCE = a_0 + a_1(LKE) + a_2(LO) + a_3(SH) + a_4(S3) + a_5(S2) + a_6(SF) + a_7(DF) \quad (1)$$

where

LCE = log of compensation per employee in a plant (2000 ringgit)
LKE = log of fixed assets per employee in a plant (2000 ringgit)
LO = plant size, measured as the log of output in a plant (2000 ringgit)
SH = share of paid workers in highly paid occupations in a plant (%)
$S3$ = share of paid and unpaid workers with high education in a plant (%)
$S2$ = share of paid and unpaid workers with mid-level education in a plant (%)
SF = share of paid workers that are female in a plant (%)
DF = dummy variable identifying MNE plants (=1 if MNE, 0 otherwise)

As in Table 2, the dependent variable is defined to include all compensation to employees including all bonuses, payments in kind, social insurance payments, and other compensation. Nominal wages are converted to real values using the consumer price index. Reflecting previous discussion, signs of the coefficients on capital intensity (a_1) and size (a_2) are generally expected to be positive because capital-intensive and larger plants are generally expected to have more productive and better paid workers than smaller, more labor-intensive ones. Capital intensity and output are converted to real values using GDP deflators for 24 industries, which were generally defined at the 2-digit or 3-digit level (Department of Statistics 2011a).[18]

Plants with higher quality workforces are expected to pay relatively high wages and the coefficients a_3, a_4, and a_5 are thus expected to be positive. In contrast,

[18]This is reasonable for output but not very accurate for capital because changes in asset prices are not reflected. Unfortunately, I know of no deflators for fixed assets in Malaysia.

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the coefficient a_6 is expected to be negative because females generally earn less than their male counterparts.[19] If data were available, it would be interesting to include the share of foreign workers in this equation, but this is not possible. To the extent that there are MNE–local differences in shares of foreign workers, worker experience, and training (which are not available), estimates of Equation (1) may face an omitted variable problem.[20] Finally, if MNE–local wage differentials persist after accounting for capital intensity, size, as well as worker occupation, education, and sex, a_7 will be positive.

Plant-level panels are compiled using plant identity codes in the data and estimated equations also include sets of year, region, and industry dummies to account for year-specific, region-specific, and industry-specific influences on the constant that are not captured by the plant-level variables. Year-specific dummies use the first year in each sample as the base and estimates are performed for both 2000–2004 and 2001–2004. These alternative samples are used to examine the sensitivity of the results to the inclusion of the census year and to facilitate comparisons of a contemporaneous specification with a lagged specification where all independent variables are lagged one year. The lagged specification is used because it is less likely to be affected by simultaneity issues. Although simultaneity may not be a large problem in Equation (1) because wage levels are not likely to be an important determinant of the right-hand side variables, the lagged specification provides an important robustness check.[21]

Region dummies are usually defined at the state level, but the lack of observations makes it necessary to combine some states when performing industry-level estimates. In three cases, states with similar population densities and nearby locations are combined (Perlis and Kedah; Kelantan, Terengganu, and Pahang; and finally Sabah, Sarawak, and Labuan). As a result, there are usually 10 regions with nine dummies defined using Kuala Lumpur as the base.[22] Industry dummies are

[19] Alternatively, Ramstetter (2012a) disaggregates shares of workers in highly paid occupations, highly educated workers, and moderately educated workers by sex. This paper uses the specification in Equation (1) because it simplifies interpretation of coefficients on the occupation, education, and gender variables, and is more comparable to the specification in Lipsey and Sjöholm (2004a). Most importantly, estimates of MNE–local wage differentials from Equation (1) are very similar to corresponding estimates of the alternative specification in Ramstetter (2012a).

[20] An anonymous referee also pointed out that export orientation of plants might affect the scope of MNE–local wage differentials, implying that the omission of export orientation might also create omitted variable bias. I am cognizant of this possibility and have examined the issue closely for both Indonesia and Malaysia in Ramstetter (2014). Because the literature suggests that exporters have to incur sunk costs related to the creation of export networks and related firm-specific assets, which are similar to the firm-specific assets possessed by MNEs, this makes it difficult to include both export orientation and ownership as independent variables in Equation (1). When Equation (1) was estimated separately for exporters and non-exporters in Malaysia, MNE–local differentials were slightly larger for exporters in samples of all industries combined (8.8%–9.2% vs. 6.2%–7.5% in pooled OLS estimates and 7.2%–7.8% vs. 4.7%–6.7% in random effects estimates), but industry-level results were weaker and inconsistent.

[21] Ramstetter (2012a) also estimates an alternative, contemporaneous specification (see note above) for 2000–2002 and 2002–2004, in addition to 2000–2004. Results for the subperiods suggest that significant, MNE–local wage differentials were more common in the earlier period. This paper focuses on longer panels because they are thought to be relatively reliable and can facilitate more meaningful estimates of the lagged specification.

[22] In the regression for office, computing, and precision machinery, one less region is used because of the lack of plants.

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defined at the 3-digit level. Some industries are defined at the 3-digit level and other 3-digit subcategories contain too few plants to facilitate estimation; thus, industry dummies are excluded from several of the industry-level regressions.[23] Because the descriptive data and previous research for Indonesia and Thailand suggest large variations in MNE–local wage differentials among industries, estimates are performed individually for 17 industries and compared to results for the 17 industries combined. In general, the industry-level results are thought to be more reliable than results for all 17 industries combined.

Results of pooled ordinary least squares (OLS) and random effects panel estimates are also compared to evaluate the robustness of the results to alternative econometric assumptions. Fixed effects panel estimates are often used with data such as these, but they cannot reveal the extent of MNE–local wage differentials because ownership is time invariant for most plants. Hence, if a fixed effects estimator is used, the coefficient on the MNE dummy a_7 measures the wage differential between plants changing ownership and those with constant ownership, not the MNE–local wage differential, which is the primary concern in this paper. The pooled OLS results are the easiest to interpret because the coefficient a_7 is approximately equal to the percentage difference in wages between MNEs and local plants. When a random effects estimator is used, the presence of individual effects complicates the interpretation of this coefficient, but it is still important to examine how sensitive the results are to alternative econometric assumptions.

Table 6 presents the slope coefficients, a goodness of fit measure (R^2), and the results of the Breusch-Pagan test for random effects for estimates in combined samples of all 17 sample industries. The Breusch-Pagan test is always highly significant at the 1% level or better, both in these combined estimates and in the industry-level regressions discussed below. This implies that random effects should be preferred to OLS, but I remain interested in checking the robustness of the results to alternative assumptions. Robust standard errors are used to address potential heteroskedasticity, and there were no indications of multicollinearity, which might be suspected among shares of workers with high education and shares in highly paid occupations, for example.[24]

In this combined sample, coefficients on capital intensity, output, and the three measures of labor quality were positive as hypothesized and highly significant in almost all estimates. The only exception was in the contemporaneous specification for 2000–2004, when the coefficient on the share of moderately educated workers became insignificant. The coefficient on the female share was negative as hypothesized and highly significant. R^2 ranged from 0.55 to 0.57, indicating that these estimates described the variation in the dependent variable reasonably well.

[23] Industry dummies are not included in estimates for apparel, wood, paper, rubber, plastics, motor vehicles, and furniture (Ramstetter 2013, Appendix Table 6).

[24] Because of the large number of samples examined, it is not possible to show all correlation matrices, but the author can make these available upon request.

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Table 6. **Multinational-Local Wage Differentials, Other Slope Coefficients, and Equation Indicators from Estimates of Equation (1) for all 17 Sample Industries Combined**

	Pooled OLS			Random Effects		
	Lagged	Contemporaneous		Lagged	Contemporaneous	
Slope coefficient variable, indicator	**2001–2004**	**2001–2004**	**2000–2004**	**2001–2004**	**2001–2004**	**2000–2004**
	0.0242***	0.0329***	0.0338***	0.0183***	0.0360***	0.0367***
	0.1071***	0.1178***	0.1187***	0.1032***	0.1229***	0.1264***
	0.0074***	0.0070***	0.0082***	0.0037***	0.0061***	0.0074***
	0.0064***	0.0072***	0.0060***	0.0042***	0.0064***	0.0049***
	0.0011***	0.0011***	0.0005***	0.0006***	0.0007***	0.0001
	–0.0039***	–0.0035***	–0.0036***	–0.0032***	–0.0026***	–0.0025***
	0.0890***	0.0809***	0.0913***	0.0749***	0.0525***	0.0658***
R^2	0.5591	0.5735	0.5638	0.5454	0.5683	0.5579
Observations	21,671	26,855	34,491	21,671	26,855	34,491
Breusch-Pagan Test	–	–	–	8,254***	10,202***	14,135***

*** = significant at the 1% level, ** = significant at the 5% level, * = significant at the 10% level.
LKE = capital intensity, *LO* = output scale, *SH* = highly paid share of paid workers, *S3* = highly educated share of all workers, *S2* = moderately educated share of all workers, *SF* = female share of paid workers, *DF* = MNE–local differential (ratio less 1).
Note: Robust standard errors (clustered by plant for random effects) are used to account for potential heteroskedasticity. Results of the Breusch-Pagan Test (null of no random effects) is always rejected at the 1% level. These results come from estimates that also include year, industry, and region dummies. Full results including constants and coefficients on year, industry, and region dummies are available from the author.
Source: Author's estimates from microdata underlying Department of Statistics (2002, various years).

The coefficient a_7 was positive and highly significant in all estimates, indicating that MNE–local wage differentials among all medium-large plants remained positive and meaningful statistically, even if the influences of capital intensity and size, as well as worker occupation, education, and sex, are accounted for. Not surprisingly, however, accounting for these influences greatly reduced the size of MNE–local wage differentials from over 40% (Table 2) to 8%–9% when estimated by pooled OLS and 5%–7% when estimated by random effects.

Space constraints prevent the presentation of all slope coefficients for all 17 industry-level estimates but they are available in Ramstetter (2013, Appendix Table 6). The output variable was the only one that was consistently positive and significant at the 5% level or better in all 102 estimates performed. Positive and significant coefficients were also common for shares of highly paid and highly educated workers as well as capital intensity (91, 85, and 79 of the estimates, respectively). The coefficient on the female share was also negative and significant in most industry-level estimates (74). The equation fit the data the worst in furniture,

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Table 7. **Industry-level Estimates of Multinational-Local Wage Differentials after Controlling for Capital Intensity, Size, Labor Occupation, Labor Skill, and Labor Gender from Equation (1)**

	Pooled OLS			**Random Effects**		
	Lagged	**Contemporaneous**		**Lagged**	**Contemporaneous**	
Industry	**2001–2004**	**2001–2004**	**2000–2004**	**2001–2004**	**2001–2004**	**2000–2004**
Food and beverages	0.1069***	0.1154***	0.1176***	0.1104***	0.1241***	0.1075***
Textiles	0.1084***	0.1155***	0.1196***	0.0269	0.0804*	0.0627
Apparel	0.0764***	0.0433	0.0499**	0.0922**	0.0551	0.1138***
Wood products	0.0040	–0.0084	0.0047	0.0203	–0.0170	0.0047
Paper products	0.0805**	0.0661**	0.0710***	0.0715	0.0496	0.0206
Chemicals	0.0950***	0.0858***	0.0958***	0.0679**	0.0858***	0.0906***
Rubber products	0.2259***	0.2076***	0.2195***	0.1470***	0.1121***	0.1215***
Plastics	0.0798***	0.0749***	0.0906***	0.0579**	0.0266	0.0409*
Non-metallic mineral products	0.1077***	0.0728**	0.0845***	0.0865**	0.0142	0.0317
Basic metals	0.1023***	0.1153***	0.1124***	0.0436	0.0477	0.0462
Fabricated metals	0.0408*	0.0316	0.0692***	0.0597*	0.0336	0.0743**
General machinery	0.0911**	0.0762**	0.0755***	0.1141**	0.1282***	0.1365***
Office, computing, and precision machinery	–0.0140	–0.0503	–0.0273	0.0047	–0.0234	–0.0379
Electrical machinery	0.1020***	0.0903***	0.1126***	0.0604**	0.0789**	0.0862***
Radio, TV, and communication machinery	0.0754***	0.0633***	0.0460***	0.0719***	0.0435*	0.0284
Motor vehicles	0.1091**	0.1361***	0.1617***	0.1267**	0.1270*	0.1605**
Furniture	0.0993***	0.1057***	0.1090***	0.1103***	0.0690**	0.0702**

*** = significant at the 1% level, ** = significant at the 5% level, * = significant at the 10% level.
Note: Robust standard errors (clustered by plant for random effects) are used to account for potential heteroskedasticity. Results of the Breusch-Pagan Test (null of no random effects) is always rejected at the 1% level. Other slope coefficients and equation statistics are presented in Appendix Table 6. These results come from estimates that also include year, industry, and region dummies. Full results including constants and coefficients on year, industry, and region dummies are available from the author.
Source: Author's estimates from microdata underlying Department of Statistics (2002, various years).

where R^2 ranged from 0.30 to 0.38. R^2 was 0.39 or higher in all other industries. The smallest sample was 322 observations in the lagged specification for office, computing, and precision machinery, and most samples exceeded 1,000. In short, for these 17 industries, all samples were sufficiently large to allow relatively reliable analysis, and the estimates explained the variation of wages relatively well.

Table 7 presents estimates of the MNE–local wage differentials from industry-level estimates of Equation (1). As in Table 2, wage differentials often differ greatly across industries. These wage differentials were positive and significant at the 5% level or better in all estimates for six of the 17 industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. Estimated differentials tended to be largest in rubber (21%–23% if estimated by pooled OLS and 11%–15% if estimated by random effects). Estimated differentials were also large and significant in five of the six estimates for motor vehicles (11%–16% and 13%–16%, respectively). Consistently significant differentials were smallest

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in chemicals (9%–10% and 7%–9%, respectively) and furniture (10%–11% and 7%–11%, respectively). Differentials were also positive and significant in four of the six estimates for another four industries: apparel; plastics; non-metallic mineral products; and radio, TV, and communication machinery. In another three industries (textiles, paper, and basic metals) OLS results suggested positive and significant differentials, while random effects results suggested no significant differentials. Finally, there were no significant differentials in two industries (wood and office, computing, and precision machinery), and there was only weak evidence of positive differentials in fabricated metals. Negative and significant differentials were never observed.

The results are thus more or less consistent with the observations from the descriptive statistics analyzed in the previous section. MNEs tended to pay higher wages than local plants. However, MNEs also tended to be relatively capital-intensive, large, and have relatively large shares of workers in highly paid occupations and with higher or moderate education. Thus, accounting for these influences greatly reduces the scope of conditional MNE–local wage differentials in most industries. Perhaps the most conspicuous difference had been in rubber products, where conditional differentials were relatively large and statistically significant, but unconditional differentials were relatively small compared to other industries. This suggests that the measures of worker occupation, education, and sex, as well as capital intensity and size were not as strongly related to MNE–local differentials in this industry as in others.

In contrast, the lack of significant differentials in wood suggests that worker quality, worker sex, capital intensity, and size accounted for the vast majority of the substantial unconditional differentials observed in this industry. In office, computing, and precision machinery, differentials were similarly small and/or insignificant, whether measured conditional on worker quality and other plant characteristics or unconditionally. This probably reflects the heavy MNE dominance of this industry and its labor-intensive nature. As emphasized above, conditional and unconditional differentials were either both relatively high or low in a number of other industries. However, it is very difficult to explain the precise reasons for the inter-industry variation in the size of MNE–local differentials.

V. Conclusions

This paper has investigated the extent of wage differentials between medium-large MNEs and local plants in Malaysia in the early 21st century. A brief literature review highlighted the important fact that MNEs have often been found to pay higher wages than non-MNEs. The main cause of these wage differentials is probably the fact that MNEs tend to hire relatively large shares of highly skilled workers. However, MNEs may also be motivated to pay higher wages to facilitate recruitment,

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reduce turnover, and compensate for higher worker productivity that results from the MNE's possession of firm-specific, generally intangible assets related to technology, marketing, and management, for example. MNE–local wage differentials can also result from workers' reluctance to work for MNEs.

In the 17 industries examined, medium-large MNEs paid wages that were on average about two-fifths higher than wages in corresponding local plants. Consistent with previous evidence summarized in the literature review, shares of highly educated workers (about three-fifths to 90%) were also substantially higher in MNEs than in local plants. Shares of moderately educated workers and workers in highly paid occupations were also about one-fourth to one-third higher in MNEs. Previous evidence also indicates that MNEs tended to be more capital-intensive and larger than local plants during this period. Estimates of earnings equations suggest that differences in worker quality and plant characteristics are strongly correlated with plant-level wages.

After accounting for differences in worker occupation, education, and sex, as well as the size and capital intensity of plants, and the effects of industry affiliation, plant location, and annual fluctuations on the constants estimated, estimates of MNE–local wage differentials became much smaller, an average of 5%–9% in the 17 industries combined, but these differentials were highly significant statistically. When all slopes are allowed to vary among the 17 industries (by estimating separate equations for each industry), results varied across industries and estimation method. Significant differentials were more common in the pooled OLS estimates than in the random effects estimates. There were consistently significant differentials in six industries: food and beverages, chemicals, rubber, general machinery, electrical machinery, and furniture. These two key results are also robust to alternative specifications of the occupation, education, and sex variables and observed in shorter subperiods (2000–2002 and 2002–2004; Ramstetter 2012a). There was also relatively strong evidence of positive, conditional differentials in motor vehicles; apparel; plastics; non-metallic mineral products; and radio, TV, and communication machinery, but these results are not as consistent when estimated with alternative specifications or in subperiods.

These findings are an important addition to the literature on MNE–local wage differentials in Southeast Asian developing economies, largely because the Malaysian data allow more detailed measurement of worker quality than similar data for other countries. The evidence is consistent with previous studies of Indonesia, for example, suggesting that MNEs tend to pay their workers more than local plants even accounting for differences in worker quality and related plant characteristics in Southeast Asia. This in turn implies that MNEs impart important benefits on the workers who are fortunate enough to work for them. Many policy makers in Malaysia and other developing economies recognize these benefits, and it is important to know that this understanding is supported by empirical evidence.

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Although these results are important, this paper leaves several related questions unanswered. For example, how do MNE takeovers of local plants (or vice versa) affect wage differentials? Alternatively, does MNE presence affect wage levels in local plants in Malaysia? Although such questions are of keen interest, their answers require use of statistical techniques that are not compatible with the evaluation of average wage differentials and are left for future research. Analysis of the latter question also requires aggregation of industries and the industry-level results from this paper suggest aggregation may bias results. It is also important to reemphasize that this study fails to account for several potentially important aspects of worker quality often accounted for in similar studies of earnings by individuals. These include worker background (e.g., race or nationality), experience, and training. There are also potentially important econometric issues relating to potential simultaneity and sample selection bias, which this and previous papers in this literature have not been able to address fully and should be considered further.

On the other hand, by comparing results of estimating specifications using lagged independent variables, this paper addresses simultaneity issues to a greater extent than previous estimates for Indonesia, which could only be performed in cross sections. Moreover, worker occupation and education are arguably among the two most important aspects of worker quality, and the ability to control for both of these aspects is an important advance over the research on Indonesia, for example, where data on occupation are not available. In conclusion, this paper provides important evidence that MNE–local wage differentials persist in Malaysian manufacturing, even after accounting for these key measures of worker quality, as well as worker sex and the size and capital intensity of plants.

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