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ABSTRACT

Many developing countries would like to increase the share of modern or formal sectors in their employment. One way to accomplish this goal may be to encourage the entrance of foreign firms. They are typically relatively large, with high productivity and good access to foreign markets, and might therefore be better at creating jobs than domestic firms are. However, previous research on the issue has been limited by the paucity of long data sets for firm operations.

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We examine employment growth in Indonesia in a large panel of plants between 1975 and 2005, and especially in plants taken over by foreign owners from domestic ones. Employment growth is relatively high in foreign-owned establishments, although foreign firms own relatively large domestic plants, which in general grow more slowly than smaller plants. For plants that change the nationality of ownership during our period, we find a strong effect of shifts from domestic to foreign ownership in raising the growth rate of employment, but no significant effects of shifts from foreign to domestic ownership.

The faster growth of employment in the foreign-owned plants in general is concentrated in the takeovers, especially in the year of acquisition. Foreign takeover of a domestically-owned plant, on average, brings a large immediate expansion of employment.

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1. Introduction

One of the possible consequences of inward foreign direct investments (FDI) for developing countries, and one that is of particular interest to their governments, is the extent to which the investment creates new jobs in the industrial, or “modern” sector, to help in the transformation of the economies. Lewis’ (1954) notion of a need to move people out of agriculture and into the modern sector is still a goal for many developing countries (Asian Development Bank, 2005). There are several ways in which inward FDI might play this role.

There is considerable evidence that foreign-owned firms are relatively efficient, and may for that reason have access to foreign markets that would not be within the reach of domestically-owned firms. They may also have wider contacts and knowledge of world markets and better access to financing, all advantages that should provide a positive effect on their employment.¹ On the other side, the foreign-owned firms may compete with domestically-owned firms for some markets, so that the losses of employment by domestically-owned firms may offset, to some extent, the gains in the foreign-owned firms. In addition, the foreign-owned firms may tend to be more capital-intensive than domestically-owned firms, and more intensive in the use of imported intermediate products, so that an increase in their sales adds less to employment than would a corresponding increase by domestically-owned firms.

In this paper, we use Indonesian manufacturing plant level data between 1975 and 2005 to analyze the effect of FDI on employment. We first compare rates of employment

¹ See Lipsey (2004) for a survey on host country effects of FDI. For studies on FDI in Indonesia see e.g. Blomström and Sjöholm (1999), Lipsey and Sjöholm (2004), Takii (2005), Blalock and Gertler (2008), and Arnold and Javorcik (2009). For studies on multinational firms and employment in high income countries, see Bandick and Karpaty (2007), and Hakkala et al. (2008).

growth in foreign-owned and domestically-owned plants. Second, we examine employment growth after foreign acquisitions of domestically-owned establishment and domestic acquisitions of foreign-owned establishments. These observations hold constant the identity of the individual establishment, although not its characteristics. If foreign ownership provides superior technology or better access to world markets, establishments should tend to raise their employment after foreign takeovers. If these advantages require continued foreign ownership, there may be employment losses when a foreign-owned establishment is acquired by a domestic firm. On the other hand, if the technological or other gains from foreign ownership are retained in the establishment, its level and growth of employment may continue after a domestic acquisition.

Acquisitions may not be random with respect to the prospects for the target establishment. In order to control for unobservable firm characteristics that could involve selection bias in foreign acquisitions, we combine propensity score matching techniques with the more general difference in differences estimator. To test whether any effects are due to changes between foreign and domestic ownership, we examine both domestically-owned establishments that are acquired by foreign owners and foreign-owned establishments that are acquired by domestic owners.

2. Foreign plants in Indonesian manufacturing

We analyze Indonesian manufacturing data supplied by the Indonesian Statistical Office for the period, 1975 to 2005 for all manufacturing plants with more than 20

employees. A plant identification code enables us to construct a panel and follow individual plants over time.

Employment in manufacturing plants with more than 20 employees increased from fewer than seven hundred thousand in 1975 to about 4 million in 1997 and later years (Figure 1). That growth was driven mainly by a strong increase in employment in domestically-owned private plants, which remained close to three quarters of all plants during the entire period. Foreign establishments have played an increasing role in Indonesian manufacturing employment. Plants with some foreign ownership, accounting for less than 10 percent of manufacturing employment in 1975, employed around 20 percent in 1997, at the time of the Asian crisis. After that the share declined slightly, but then recovered to 20 percent again in 2005. The share of government-owned plants, much larger than that of foreign plants in 1975, shrank steadily after the late 1980s, and was only 5 percent of manufacturing employment in 2005.

The industry sectors and the ownership groups differed in some important aspects. One extreme difference was in size: government-owned plants were far larger than domestically-owned private plants, five times as large, on average, in 1975 and still over three times as large in 2005. They were much larger also within the industry groups, with a few exceptions (Table 1). Foreign-owned plants were also much larger than domestically-owned private plants, about three times as large in both beginning and end years. In 2005, the foreign-owned plants were larger than domestically-owned private plants in every group. The size disparity may be an element in the frequency and success of takeovers.

To the extent that we can associate the share of blue-collar workers in total employment with the average skill level in an establishment, it appears that foreign firms tended to use a slightly higher skill labor force than private domestic firms in the same industry. Government-owned plants operated with the lowest proportions of blue-collar workers consistently across almost all industries. Only government-owned plants employed work forces made up to the extent of 30 percent or more of white-collar workers, almost 40 percent in a few cases, while private domestic plants employed more than 20 percent white-collar workers in only one industry group in one year.

The changes in the share of Indonesian manufacturing employment in foreign-owned plants, discussed above, came about in several different ways. One was takeovers of domestically-owned plants by foreign firms, offset by takeovers of foreign-owned plants by Indonesian owners. Another was the establishment of new plants by foreign owners and the demise of existing plants. A third source of change was any differences in average rates of growth in employment between locally-owned and foreign-owned plants.

These different sources of growth of employment in foreign owned plants are shown in Table 2. Up through 1989, foreign takeovers accounted for a large part of total growth in employment in foreign-owned manufacturing establishments, but they were offset by declines in such employment from local takeovers of foreign-owned plants. After 1989, the foreign takeovers added more to the foreign-owned share than the domestic takeovers took away.

The path of takeover activity between foreign and domestic owners, in terms of numbers of takeovers, is described by Figure 2. The numbers of takeovers had been

fairly similar in the two directions until the 1990s, but since then, foreign takeovers have been more numerous, except in 1997, during the Asian crisis. However, the net effect of foreign and domestic takeovers was less important as a source of employment growth in foreign-owned establishments than the combination of the establishment of new foreign-owned plants and their more rapid growth.

3. Econometric approach

We begin the econometric analysis by treating growth in employment as a function of various plant characteristics:

$$\Delta \ln L_{it} = \ln L_{it} - \ln L_{it-1} = \alpha + \lambda \text{Plant}_{it-1} + \sum \beta_w \text{Ownership}_i + \sum \beta_t \text{Year_dummy}_t + \sum \beta_{ind} \text{Ind_dummy}_j + \sum \beta_R \text{Reg_dummy}_k + \varepsilon_{it}, \quad (1)$$

where i indexes firms, and t indexes year.

The variables included in the model are:

L: Employment.

Plant: A vector of lagged plant characteristics, i.e. plant size measured by employment, energy intensity (quantity of energy per employee), which is a proxy for physical capital intensity, and inputs of intermediate goods, defined as raw materials, fuel, and lubricants, per employee

Ownership_i: Ownership dummy variables indicating three ownership categories, private domestically-owned, private foreign-owned, and government-owned.

Dummy variables for year, industry (two-digit ISIC), and region (provinces aggregated into 5 regions).

The plant control variables might be endogenously determined and we try to control for this possibility by lagging them one period. Hence, we assume that growth in employment between period t and $t+1$ is caused by, for instance, the size in period t . Labor productivity, as measured by value-added per employee, was included in some experiments, but it added nothing to the equation and was dropped.

Ownership is divided into foreign, government-domestic and private-domestic. Foreign establishments are defined as plants with any foreign ownership. Government-owned establishments are defined as plants without foreign ownership but with any government (central or local) ownership. The remaining plants are defined as private-domestically owned. In some later estimations, ownership is instead a dummy on foreign acquisitions of domestically owned plants and a dummy on domestic acquisitions of foreign owned plants. The universe we examine in the estimations on takeovers includes all firms except those that experience multiple ownership changes. Firm-specific effects and time dummies are included in the regressions. The ownership dummy variables are one when an ownership change is recorded and thereafter.

Acquisitions may not be random with respect to factors that determine future growth. This means that estimates on employment growth may be biased if non-randomness is not taken into account. We therefore use propensity score matching (PSM) combined with the more general difference-in-differences technique, as suggested by e.g. Blundell and Costa Dias (2005), Heyman et al. (2007), and Arnold and Javorcik (2009).

The matching procedure aims to find a group of non-acquired plants that display the same characteristics as the group of acquired plants. For foreign takeovers, the control group is taken from the plants that are always domestic, while for domestic takeovers, the control group is taken from the plants that are always foreign. Matching techniques are used to construct samples of non-acquired plants that are twins to acquired plants and, thus, approximate the non-observed counterfactual event: what would have happened to these plants if they had not been acquired.

The probability of takeover, the propensity score, is obtained by fitting a probit model. The model specification is similar to the OLS regressions above but adds variables such as plant age and log productivity, lagged one year. Table A1 shows that young and large domestically-owned plants with high productivity and energy intensity are relatively likely to be acquired by foreign owners. By contrast, foreign-owned plants that are small, with low productivity and energy intensity, are relatively likely to be taken over by domestic owners. Hence, foreigners acquire what seem to be relatively good domestic plants (cherry picking) and domestic actors acquire relatively poor foreign owned plants. By constructing a matched sample based on the probability of takeover, the selection problem is reduced.

We employ a nearest neighbor matching technique with replacement to construct our matched sample of plants. In case of foreign takeover, each domestic plant that would be acquired later by foreign owners is matched to an always domestic plant that has the closest propensity score. The same approach is used for domestic takeovers. Moreover, the matched treated and control units are from the same year and same industry.

Of the 1,037 foreign takeovers, 390 are in the treatment group. The loss in the number of foreign takeovers from the treatment group is mainly due to the fact that there are 475 foreign takeovers reported to have taken place in the second year after the plant starts operation, and thus there is no employment growth in the pre-acquisition period to compare with. Another 108 takeovers are dropped because there are some missing values in the observed characteristics used to estimate propensity scores. Of 652 domestic takeovers, 291 are included in the treatment group. 233 domestic takeovers are dropped because they are reported to have taken place in the second year of operation, and another 128 domestic takeovers are dropped because of missing values. It is a cause for concern that so many takeovers are dropped because they are reported to take place in the second year of existence. However, the regression analyses were carried out on samples with and without takeover in the second year, and the results were robust.

Tests are conducted to make sure that our matched sample is balanced in the sense that the treated and control units have similar pre takeover values on the control variables (Tables A2 and A3). In the matched sample, the differences in means of the control variables are not significant between treated and control units.

Having obtained a control group of firms, we combine propensity score matching with the difference-in-differences estimator to estimate the impact of acquisitions on employment. The difference-in-differences approach compares employment growth for the treated group of acquired plants with the relevant control group of plants that are not acquired.

$$DD = \left(E(L_{post}^{treated} | X) - E(L_{post}^{control} | X) \right) - \left(E(L_{pre}^{treated} | X) - E(L_{pre}^{control} | X) \right) \quad (2)$$

L is employment growth rates (difference in log employment) or, in some estimations, employment itself. Post refers to the post-acquisition period, which could be in the year of acquisition, or one year after, or the average of the whole post-acquisition periods. Pre refers to the period before acquisition. Similarly it could be one year before the acquisition, or the average of the all the years before acquisition. The difference in the second parenthesis corrects the selection bias in the pre-acquisition period.

4. Econometric results

5.1. Determinants of the rate of plant employment growth

We start in Table 3 with simple OLS analyses on the whole universe of manufacturing plants. The equations include the ownership variables, *Foreign* and *Government*, and the reference group is therefore domestic-private firms. The coefficient for *Foreign* is positive and statistically significant, indicating a rate of growth in employment 6 percent higher in foreign-owned than in domestic-private plants. The coefficient for government is statistically significant, but only 2 percent.

The equation includes plant characteristics that might affect employment growth. Large firms have comparatively low growth rates, as has been found in previous studies (e.g. Karlsson et al., 2008). Plants that are more energy intensive and use more raw materials are associated with higher employment growth rates in general.

The last two columns examine growth of the numbers of blue- and white- collar workers. The positive effect on the employment of blue-collar workers is substantially

larger than the effect on white-collar workers: 6 percent compared to 3.6 percent. The effect of government ownership is also higher for blue- than for white- collar workers but both effects are small compared to the effect of foreign ownership. Finally, the negative effect of size and the positive effect of input per employee on employment growth primarily affect blue-collar workers, as is also the case for the positive effect from energy intensity.

The evidence of Table 3 is that foreign-owned plants tend to increase their employment 6 percent faster than private domestically-owned plants over the years of their existence, given the other characteristics of the plants.

5.2. Foreign takeovers and employment growth

In Table 4, we separate the effects of foreign takeovers from those of foreign ownership in general. The OLS estimate of the effect of foreign ownership aside from foreign acquisition effects is about 5 per cent per year faster growth in employment. The effect of foreign acquisition is subsequent growth in employment at a rate 9 per cent faster than in domestic plants.

The fixed effect approach looks at growth in employment within a firm before and after the acquisition and removes the time-constant unobserved plant characteristics that could confound the explanation of acquisition effects. Only firms that change ownership are included. Fixed effect estimates raise the foreign acquisition effect to 11 percent. The effect on blue-collar workers is about twice as large as the effect on white-collar workers. Moreover, the results indicate that domestic acquisition reduces the

subsequent rate of employment growth, although only the effect on white-collar workers is statistically significant.

The effect of FDI on employment might differ between trade regimes (Balasubramanyam et al., 1996). FDI flows drawn to a developing country to take advantage of cheaper labor costs would respond to an export-oriented policy by expansion. By contrast, FDI induced by import substitution policy is limited by the size and income level of the host-country market.

To test for the possible impact of differences in trade regimes, suggested above, we divide Indonesia's history since 1975 into three periods, which we think of as an import substitution period 1975-1985; a trade liberalization period 1986-1996; and the crisis and post-crisis period 1997-2005.² The results, shown in Table 5, support the idea that the effects of FDI on host countries are affected by trade regimes. During the trade liberalization period 1986-1996, the employment growth rate effect of foreign acquisition was as high as 19 percent.³ In contrast, foreign takeovers had no significant effects on employment growth rates during the earlier, import substitution, period 1975-1985.

5.3. Matched comparisons of domestic and foreign takeovers

We test these results for possible biases from the selectivity of acquisitions by using propensity score matching. The results are shown in Table 6. Foreign takeovers raise the growth rate of employment by 10 percent on average during the acquisition and post-acquisition period, after correcting for the pre-acquisition differences between

² See Aswicahyono et al. (1996; 2008), and Aswicahyono and Hill (2002) for discussions on Indonesia's policy regimes, and for similar distinctions in different periods.

³ $(\exp^{0.174} - 1) \cdot 100 = (1.1901 - 1) = 0.1901$

acquired and non-acquired plants. This is similar to the fixed effect estimate. Domestic takeovers, according to the matched comparison, do not affect employment growth rates.

While the employment growth rates in foreign takeovers do not differ significantly from those of plants remaining domestically-owned in the first and second years after the takeover, the impact of the foreign takeovers continues, because the acquired plants grow so much in the year of takeover that the same growth rate after takeover implies a considerably larger absolute growth in employment in the following years in the acquired plants, relative to domestic plants, as is shown in Table 7. There are no similar effects in absolute terms from domestic acquisitions of foreign plants. The concentration of employment growth rate change in the year of acquisition and the consequent carryover of absolute employment growth into the following years are vividly illustrated by Figures 3 and 4.

One implication of this concentration in the year of acquisition is that the usual assumption that “Greenfield” investment adds resources to the recipient country, but acquisitions only change ownership is wrong. Acquisitions can be associated with very substantial additions to resources, quite apart from any gains that might arise from transfers from less-skilled to more-skilled management.

5. Conclusions

Foreign owned Indonesian manufacturing plants grew more rapidly in employment than plants that remained in Indonesian ownership during 1975-2005, given the other characteristics of the plants. The more rapid growth is confirmed by several tests of the data including a close examination of takeovers of locally-owned plants by

foreigners and of foreign-owned plants by local owners. Employment in plants that were foreign-owned throughout our period grew, on average, about 5 percent faster than in plants that were always domestically owned. Plants that were acquired by foreigners grew about 10 percent faster according to fixed effect estimates. Considering that foreign plants are on average considerably larger than domestic plants, the difference in the number of jobs created was large.

The propensity score matching consistently confirmed the advantages of foreign ownership for employment growth. There is also some indication that the employment growth effects of foreign ownership are sensitive to host country trade policy, with liberalization encouraging the expansion of employment through foreign takeover. There were indications in several tests that there was a decline of employment growth in shifts from foreign to domestic ownership, although that result is not statistically significant.

Most of the employment effects of foreign takeovers took place in the year of takeover. There was relatively little effect on growth rates in the following years, but the absolute additions to employment in the years after takeover were larger than they would have been under continued local ownership because the base was much larger.

The negative or insignificant effect of domestic acquisition on foreign-owned plants, as in the fixed effects estimate and the difference-in-differences estimate from a matched sample, shows that the advantages of foreign-owned plants that accounted for more rapid growth required continued foreign ownership. They are apparently lost if the plant returns to domestic ownership.

One possible implication of the concentration of growth in the year of acquisition is that the distinction between “Greenfield investments” and acquisitions is not as sharp as is often assumed. Many of the acquisitions apparently involve major changes in the size and possibly other dimensions of the target firms.

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Figure 1. Employment in Indonesian Manufacturing, by Ownership

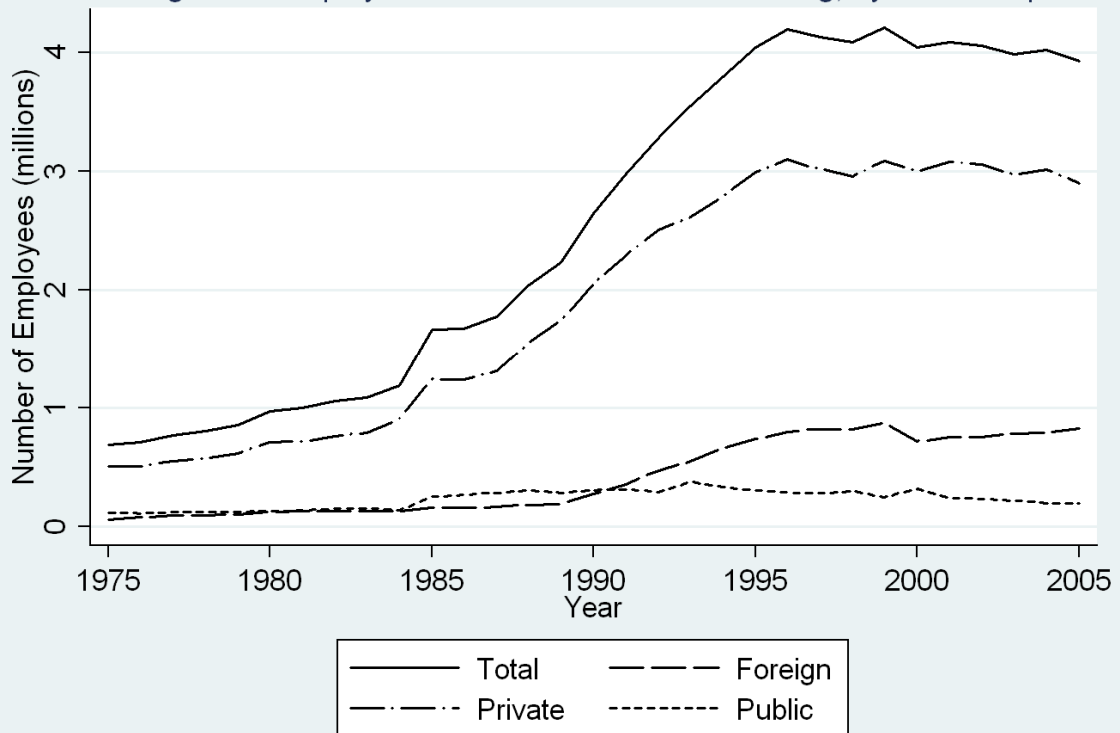
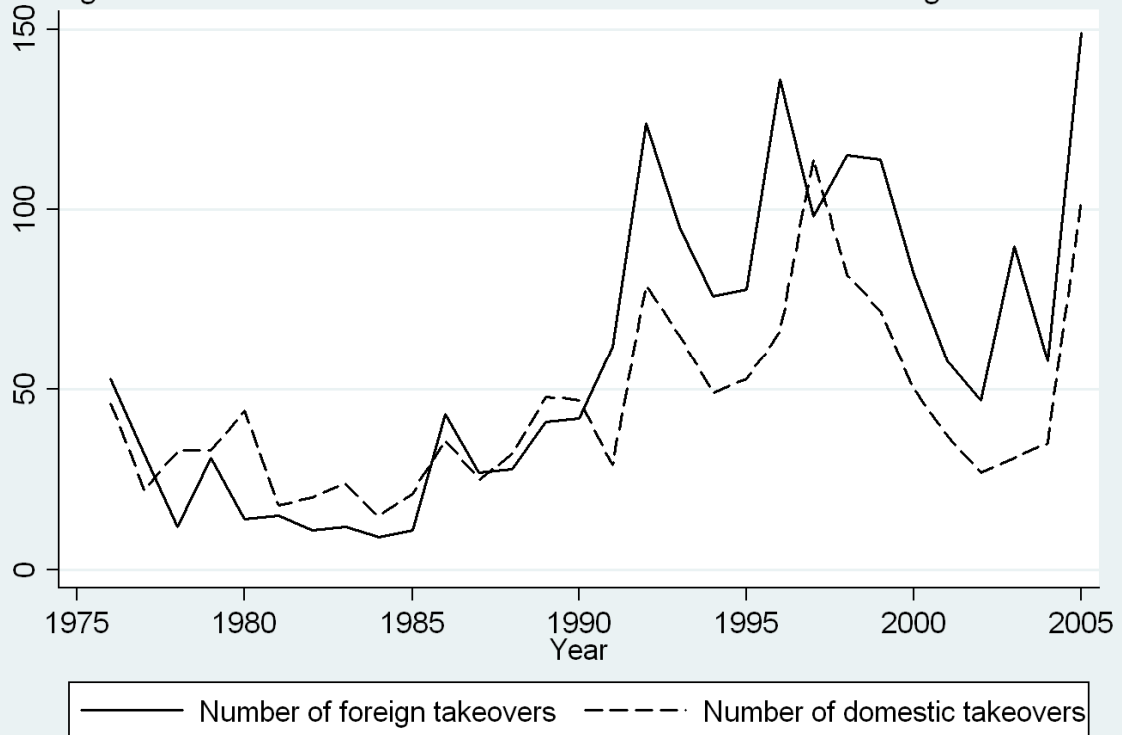


Figure 2. The number of takeovers in Indonesian manufacturing 1976-2005



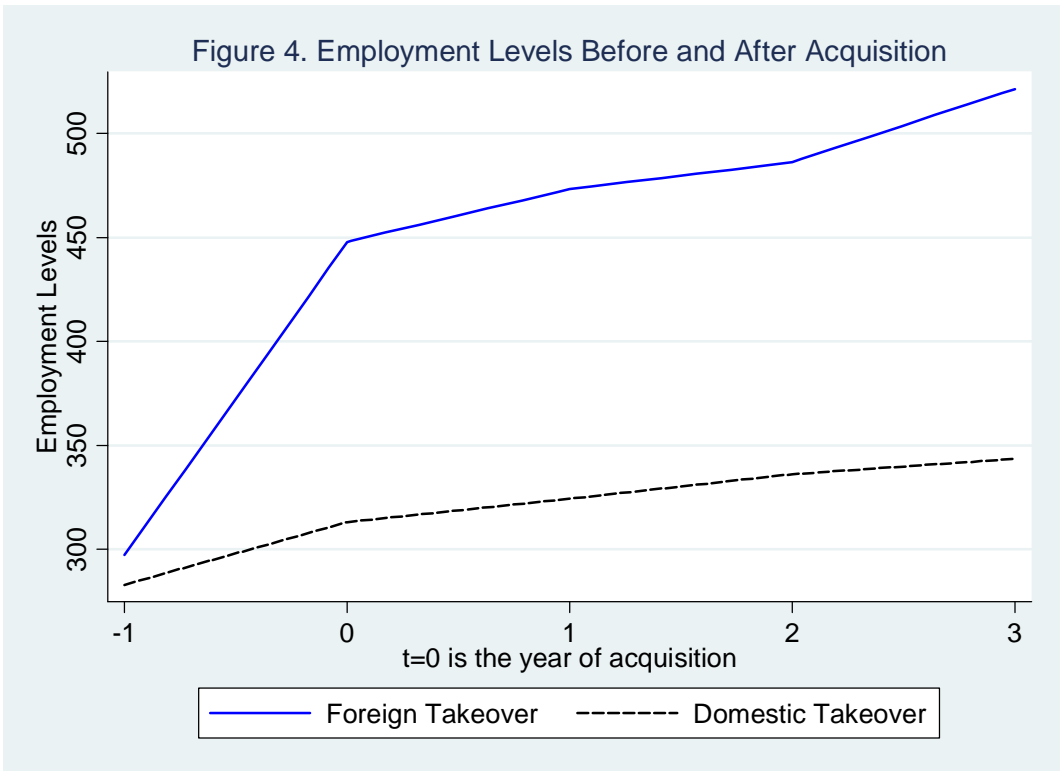
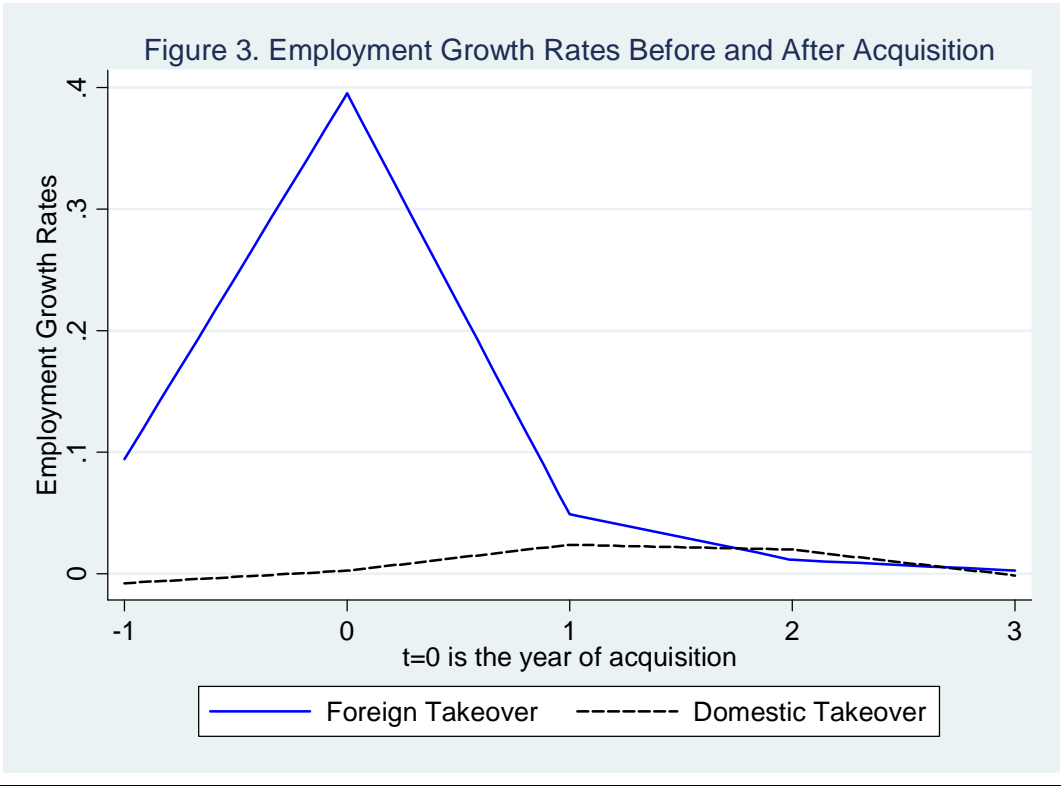


Table 1. Average number of employees per establishment and the share of blue-collar workers, 1975 and 2005

Sector	ISIC	Private-domestic		Gov't-domestic		Foreign	
		Aver, no. of empl. per plant	Share of blue-collar workers	Aver.no. of empl. per plant	Share of blue-collar workers	Aver.no. of empl. per plant	Share of blue-collar workers
1975							
Total		75	0.88	365	0.75	219	0.77
	31	91	0.88	537	0.75	179	0.81
	32	72	0.93	507	0.81	431	0.90
	33	58	0.82	90	0.86	146	0.81
	34	52	0.84	228	0.71	157	0.78
	35	74	0.83	243	0.68	167	0.64
	36	41	0.88	385	0.71	325	0.85
	37	174	0.82	72*	0.65*	96*	0.75*
	38	87	0.86	210	0.72	223	0.73
	39	47	0.90	191*	0.82*	167*	0.92*
2005							
Total		157	0.85	481	0.74	563	0.79
	31	135	0.85	507	0.74	517	0.75
	32	206	0.89	204	0.85	1060	0.89
	33	168	0.87	116	0.83	280	0.83
	34	145	0.78	519	0.75	647	0.78
	35	178	0.79	530	0.68	389	0.70
	36	89	0.87	725	0.67	398	0.80
	37	205	0.78	1822*	0.75*	215	0.76
	38	142	0.82	619	0.66	536	0.80
	39	120	0.87	287*	0.90*	664	0.87

* - Fewer than 5 observations

Table 2. Employment Growth in Foreign-owned Manufacturing Establishments in Indonesia, by Source of Growth, 1975-2005

Year	Foreign	Foreign Takeover	Domestic Takeover	Other ^a
1975~1979	49,379	21,190	10,765	38,954
1980~1984	9,197	18,463	27,435	18,169
1985~1989	30,615	47,488	47,997	31,124
1990~1994	384,856	182,561	87,909	290,204
1995~1999	135,759	216,927	181,210	100,042
2000~2005	108,500	300,782	110,081	-82,201

Note:

a). New establishments minus disappearances, firm growth after takeover, and miscellaneous changes.

Table 3. Ownership and Growth in Employment, OLS estimations

	Total employment	Blue-collar workers	White-collar workers
Foreign	0.060 (20.74)***	0.060 (19.93)***	0.036 (10.27)***
Government	0.023 (6.28)***	0.021 (5.31)***	0.011 (2.01)**
Size (t-1)	-0.038 (47.47)***	-0.036 (46.27)***	-0.026 (27.38)***
Energy (t-1)	0.011 (31.86)***	0.011 (29.51)***	0.005 (9.45)***
Inputs (t-1)	0.012 (27.53)***	0.012 (25.17)***	0.009 (13.76)***
Time dummy	Estimated	Estimated	Estimated
Ind. Dummy	Estimated	Estimated	Estimated
Region dummy	Estimated	Estimated	Estimated
R-square	0.028	0.021	0.006
No. of obs.	324,387	324,268	277,653

Note: a constant is included in all estimations. Energy, Inputs and Productivity are in log form. T- values based on robust (cluster at plant level) standard deviations are in parentheses.

* Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 4. Acquisitions and Growth in Employment.

	Total empl.	Total empl.	Blue-collar workers	White-collar workers
	OLS	Fixed effect	Fixed effect	Fixed effect
Always Foreign.	0.054 (16.21)***	--	--	--
Foreign Acquis.	0.089 (14.68)***	0.108 (6.11)***	0.122 (6.61)***	0.063 (2.98)***
Domestic Acquis.	0.004 (0.68)	-0.030 (1.58)	0.027 (1.38)	-0.044 (1.79)*
Government	0.024 (6.45)***	--	--	--
Size (t-1)	-0.039 (47.62)***	-0.426 (27.16)***	-0.425 (27.23)***	-0.353 (16.47)***
Energy (t-1)	0.011 (31.73)***	0.002 (0.61)	0.002 (0.58)	-0.004 (0.84)
Inputs (t-1)	0.012 (27.41)***	0.007 (1.35)	0.006 (1.18)	0.002 (0.18)
Time dumm.	Estimated	Estimated	Estimated	Estimated
Ind. Dumm.	Estimated	--	--	--
Region dum.	Estimated	--	--	--
R-square	0.028	0.264	0.214	0.068
No. of obs.	319,390	15,347	15,333	14,580

Note: a constant is included in all estimations. Energy, Inputs and Productivity are in log form.

T- values based on robust (cluster at plant level) standard deviations are in parentheses.

Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 5. Acquisitions and Growth in Employment in Different Time Periods,

Fixed Effects (Only Acquired Plants)

	1975-1985	1986-1996	1997-2005
Foreign Acquis.	-0.002 (0.118)	0.174*** (0.048)	0.125*** (0.029)
Domestic Acquis.	-0.037 (0.040)	0.008 (0.041)	0.001 (0.035)
Size (t-1)	-0.505*** (0.061)	-0.551*** (0.030)	-0.654*** (0.024)
Energy (t-1)	-0.002 (0.007)	0.007 (0.006)	0.013*** (0.005)
Inputs (t-1)	0.032* (0.018)	0.004 (0.009)	-0.000 (0.006)
Time dumm.	Estimated	Estimated	Estimated
R-square	0.28	0.35	0.36
No. of obs.	1,644	5,459	7,483

Note: Only plants with one takeover either foreign or domestic, are used,. A constant is included in all estimations. Size, Energy and Inputs are in log form. Standard errors clustered at plant level. Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.

Table 6. Estimated Effects of Takeovers on Employment Growth Rates After Takeover, Propensity Score Matching

	Foreign Takeover (Control: Always Domestic)		Domestic Takeover (Control: Always Foreign)	
	DD	Std. Err.	DD	Std. Err.
Acquisition year	0.304***	(0.052)	-0.001	(0.060)
One year after acquisition	0.044	(0.039)	-0.007	(0.038)
Two year after acquisition	0.003	(0.038)	0.001	(0.051)
Average of post-acquisition	0.103***	(0.029)	0.024	(0.037)

Table 7. Estimated Effects of Takeovers on Employment Growth After Takeover, Propensity Score Matching

	Foreign Takeover (Control: Always Domestic)		Domestic Takeover (Control: Always Foreign)	
	DD	Std. Err.	DD	Std. Err.
Acquisition year	145**	(58.5)	1	(26.4)
One year after acquisition	188***	(62.0)	-11	(34.5)
Two year after acquisition	250***	(60.7)	-60	(37.8)
Average of post-acquisition	181***	(55.0)	-25	(32.5)

Note:

1. For foreign takeovers, the average number of years after acquisition for both treated and control group is approximately 6 years. For domestic takeovers, both treated and control groups have on average 6 years after acquisition.
2. The pre-acquisition for this calculation uses information at one year before acquisition. It would not change the story if the average from all the years before acquisition is used instead.
3. Standard errors are bootstrapped.

Appendix

Table A1. Results from Probit Model for Foreign and Domestic Takeovers

	Foreign Takeover	Domestic Takeover
Age	-0.146*** [0.007]	-0.054*** [0.013]
Age Squared	0.003*** [0.000]	0.002*** [0.000]
Employment	0.592*** [0.076]	-0.454*** [0.152]
Employment Squared	-0.035*** [0.007]	0.022 [0.014]
Ratio of White-collar Workers	0.630*** [0.078]	-0.842*** [0.171]
Inputs	0.014 [0.010]	-0.053*** [0.017]
Energy	0.022*** [0.008]	-0.021 [0.015]
Productivity Before Acquisition ¹	0.092*** [0.015]	-0.101*** [0.020]
Year Fixed Effects	Y	Y
# of Observations	221,062	9,416
Chi-squared	1,318	349
Pseudo R-squared	0.1751	0.1112

1. Productivity at one-period before acquisition

Table A2. Balancing Property Test for Difference in Means, Foreign Takeover

Variables	Sample	Mean in the Group of Treated	Mean in the Group of Control	T-stat for Differences in Means	P- Values
Age	Unmatched Sample	6.13	11.68	-23.36	0.00
	Matched Sample	9.05	8.77	0.75	0.46
Age squared	Unmatched Sample	69.46	188.67	-17.33	0.00
	Matched Sample	121.43	120.60	0.07	0.94
Employment	Unmatched Sample	5.01	4.18	21.83	0.00
	Matched Sample	4.99	4.89	1.24	0.22
Employment squared	Unmatched Sample	26.66	18.83	21.07	0.00
	Matched Sample	26.49	25.61	0.99	0.32
Ratio of white-collar workers	Unmatched Sample	0.21	0.15	11.69	0.00
	Matched Sample	0.22	0.21	0.98	0.33
Inputs	Unmatched Sample	10.23	9.40	15.34	0.00
	Matched Sample	10.12	10.15	-0.23	0.82
Energy	Unmatched Sample	7.62	6.66	14.66	0.00
	Matched Sample	7.46	7.42	0.34	0.74
Productivity before acquisition	Unmatched Sample	9.99	9.13	22.72	0.00
	Matched Sample	9.99	9.99	-0.03	0.97

Table A3. Balancing Property Test for Difference in Means, Domestic Takeover

Variables	Sample	Mean in the Group of Treated	Mean in the Group of Control	T-stat for Differences in Means	P- Values
Age	Unmatched Sample	7.71	9.80	-7.07	0.00
	Matched Sample	10.54	9.81	1.43	0.15
Age squared	Unmatched Sample	100.46	142.09	-5.13	0.00
	Matched Sample	156.23	137.95	1.21	0.23
Employment	Unmatched Sample	4.98	5.49	-9.83	0.00
	Matched Sample	5.27	5.38	-1.65	0.10
Employment squared	Unmatched Sample	26.21	31.59	-9.06	0.00
	Matched Sample	29.08	30.39	-1.78	0.08
Ratio of white-collar workers	Unmatched Sample	0.20	0.24	-5.06	0.00
	Matched Sample	0.21	0.20	1.28	0.20
Inputs	Unmatched Sample	10.27	10.96	-9.64	0.00
	Matched Sample	10.58	10.66	-0.85	0.40
Energy	Unmatched Sample	7.66	8.12	-5.82	0.00
	Matched Sample	7.96	8.13	-1.30	0.20
Productivity before acquisition	Unmatched Sample	9.94	10.64	-11.53	0.00
	Matched Sample	10.18	10.30	-1.45	0.15