Former Foreign Affiliates: Cast Out and Outperformed?

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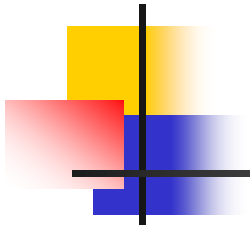
Is FDI special and thus worthy of preferential tax treatment?

- “One dollar of FDI is worth no more (and no less) than a dollar of any kind of investment” (D. Rodrik)
- Yet, 59 out of 108 countries surveyed in the World Bank’s census of investment promotion agencies offered FDI incentives in 2004
- Recent discussion: are MNCs paying too little in taxes?

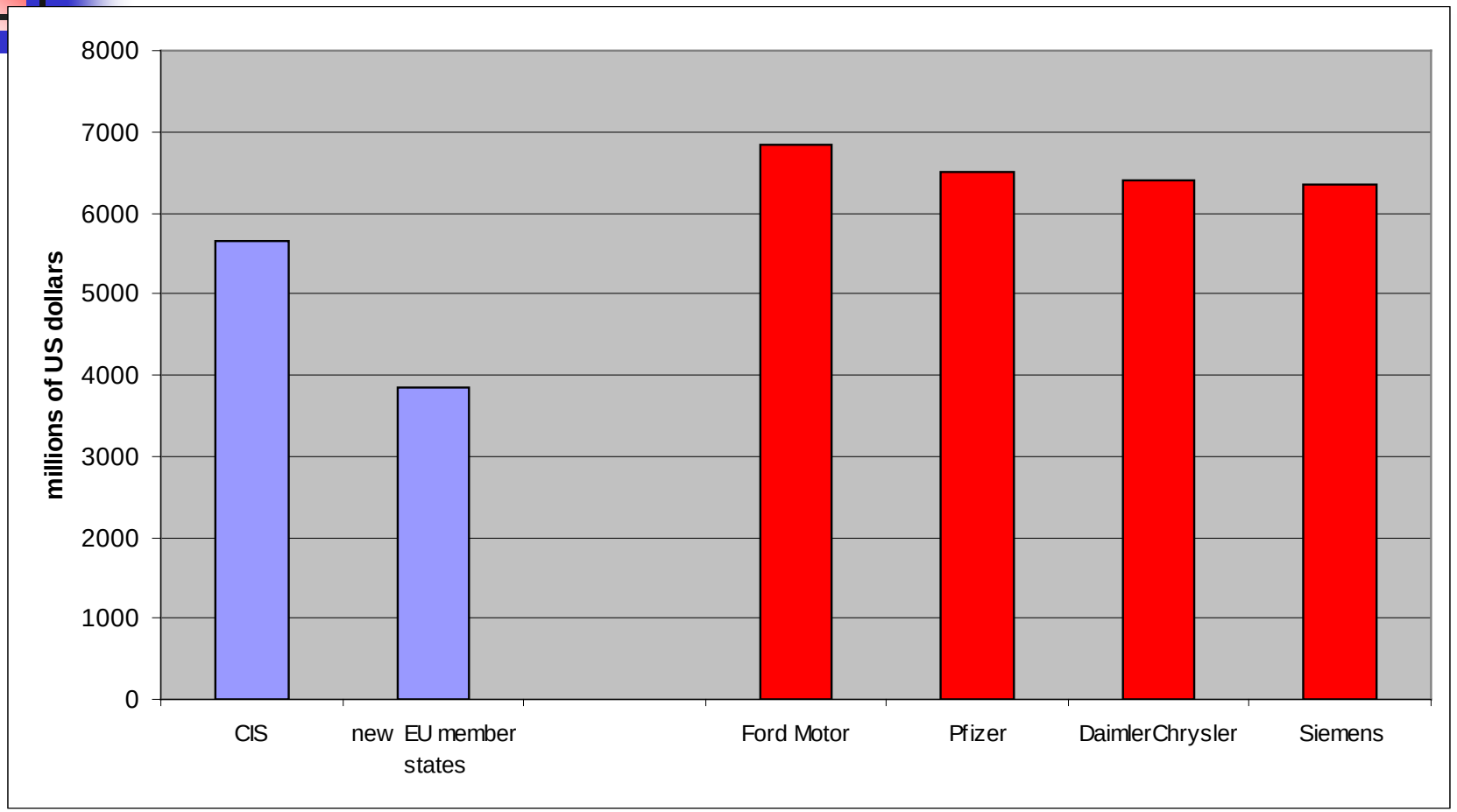


Why FDI is special

Fact 1:
MNCs are producers of knowledge

- MNCs are active in R&D and skilled labor intensive sectors (Markusen 1995)
- MNCs are more likely to offer training to their employees
- MNCs are responsible for most of the world's R&D
  - 700 multinational corporations accounted for 46% of the world's total R&D expenditure and 69% of the world's business R&D in 2002 (UNCTAD 2005)
  - R&D budgets of large multinationals may exceed R&D spending of some countries

R&D budgets of some MNCs exceed R&D spending of transition countries (2003)



CIS figure includes: Russia, Armenia, Azerbaijan, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Ukraine, Uzbekistan.
New EU member states figure includes: Czech Rep, Estonia, Hungary, Latvia, Lithuania, Poland, Slovak Rep, Slovenia.

Fact 2: MNCs transfer knowledge to their affiliates abroad

- Arnold and Javorcik (2009) focus on 400 new FDI recipients in Indonesia (1983-2001)
- Although best performers tend to receive FDI, foreign ownership also leads to increased productivity
  - Acquired plants exhibit a 13.5% higher productivity growth after 3 years
- Foreign ownership results in large and rapid changes to other aspects of plant performance
  - Sales, employment, investment, average wage

Fact 3 cont.

- FDI recipients become more integrated into international production and distribution networks

- Similar conclusions emerge from a comparison of domestic vs foreign privatizations suggesting it is foreign ownership (rather than ownership change) that matters

This paper

Research question

- How persistent are the benefits of foreign ownership?

- Is the superior performance of foreign affiliates due to a one-time knowledge transfer or is driven by continuous knowledge flows?

Why should you care?

- Important for the cost-benefit calculation of FDI incentives
  - the longer former FDI affiliates can serve as the source of spillovers, the higher the benefit side of the calculation
  - Important for whether awarding incentives should come with “a minimum stay requirement” for foreign investors

Contribution of this study

- Examine the causal effect of foreign divestment on plant performance
- Consider a range of outcomes to understand what lies behind the observed effects

- Apply the cutting-edge methodology allowing for credible estimation of mark-ups and total factor productivity (de Loecker and Warzynski 2012)
  - Estimated without needing to specify nature of product market competition. Material demand proxies for productivity (as in Levinsohn and Petrin, 2003)

Empirical strategy

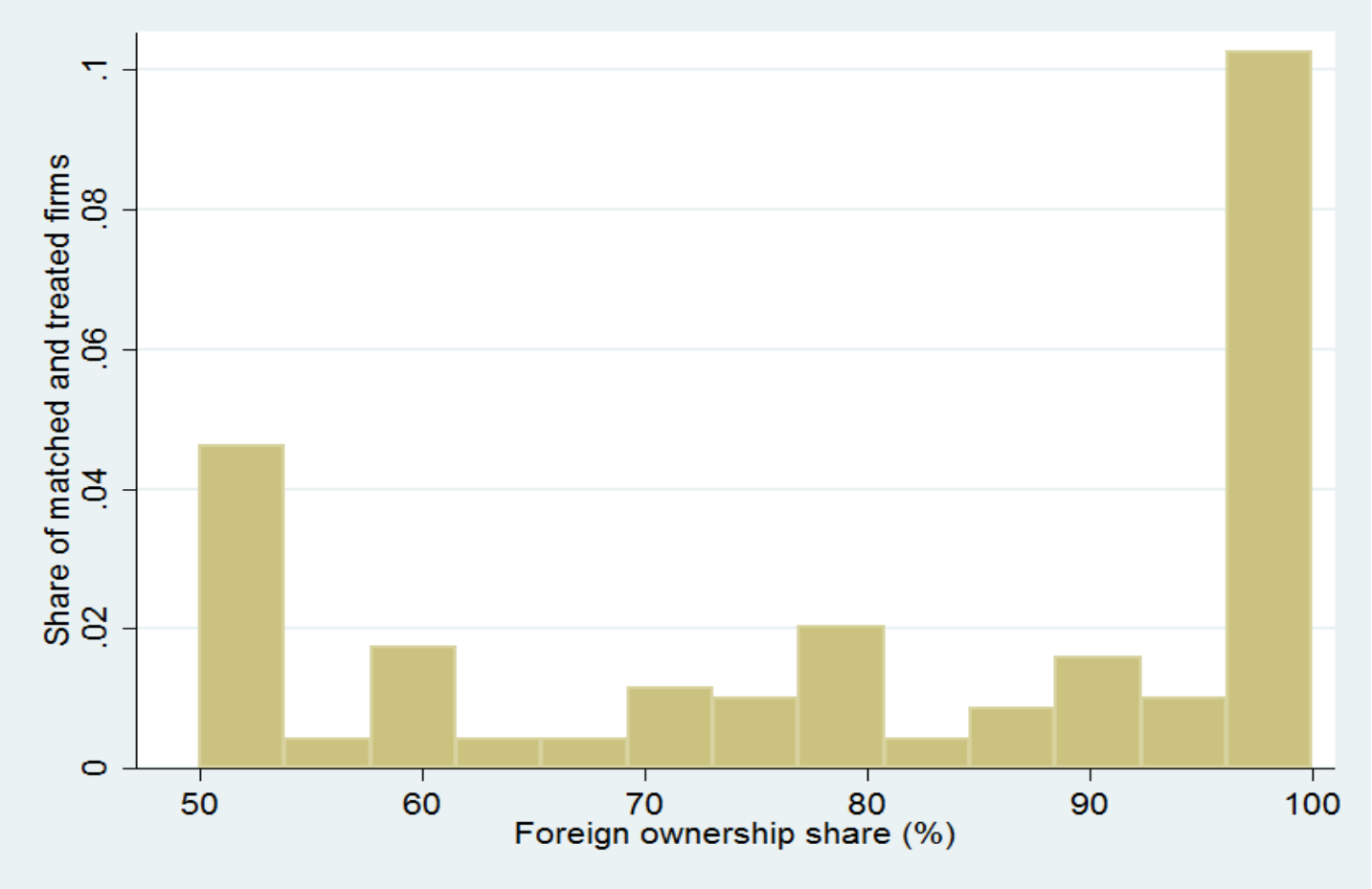
- Using propensity score matching to solve the problem of missing counterfactual
- Control group: foreign plants with similar observable characteristics operating in the same industry/year
- Difference-in-differences approach

$$Outcome_{i,post} - Outcome_{i,prior} = \Delta Outcome_i = \alpha + \beta Divested_i + \varepsilon_I$$

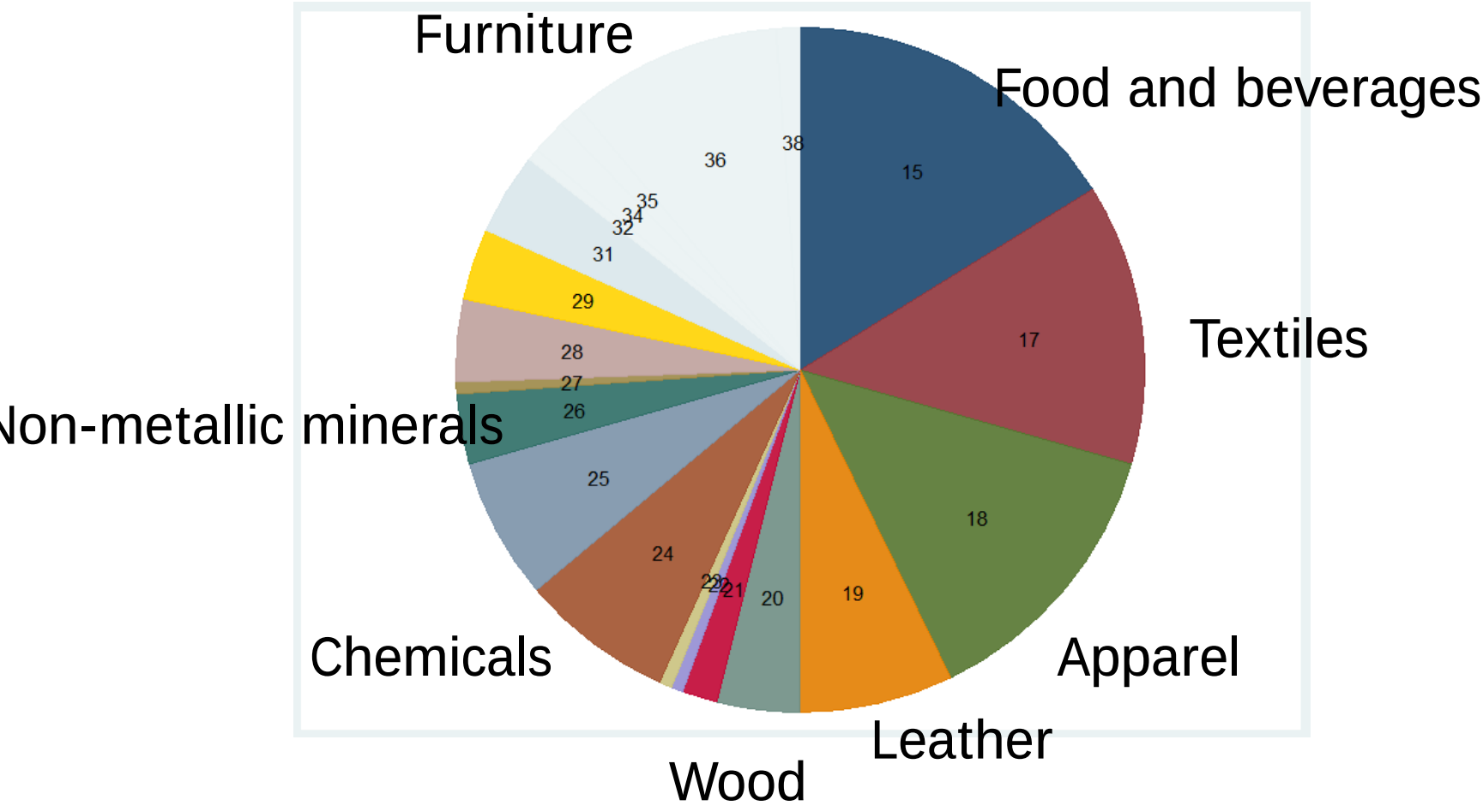
Data

- Indonesian Manufacturing Census
  - 1991-2009
  - All plants with more than 20 employees
  - Up to 165 cases of divestment with sufficiently complete data to make inferences
    - Ownership change from at least 50% foreign equity to less than 10% foreign equity
    - Traced for at least 4 consecutive years
    - Not re-acquired during this time period

Foreign ownership share prior to divestment



Divestments by sector



Predicting divestments

Log TFP $_{t-1}$	0.332	Loan-financed investment$_{t-1}$/Output $_{t-1}$	-0.004
	(0.315)		(0.003)
Δlog TFP $_{t-1}$	**0.091*** **	Time trend	0.003***
	(0.034)		(0.001)
Log markup $_{t-1}$	**-0.064*** **	**Log output $_{t-1}$**	**-0.008** **
	(0.014)		(0.003)
Δlog markup $_{t-1}$	0.002	% Exported $_{t-1}$	-0.001
	(0.003)		(0.001)
Log Employment $_{t-1}$	**-0.038*** **	Log av. wage $_{t-1}$ * TFP $_{t-1}$	0.011
	(0.011)		(0.015)
Log Employment $_{t-1}^2$	**0.003*** **	Log Capital per worker $_{t-1}$ * av. wage $_{t-1}$	0.001
	(0.001)		(0.001)
Skilled labor share $_{t-1}$	**-0.087** **	log(investment +1)$_{t-1}$	-0.000
	(0.034)		(0.000)
Log Average wage $_{t-1}$	-0.053	Log TFP $_{t-1}$ * % Exported $_{t-1}$	0.000
	(0.034)		(0.000)
Imported input share $_{t-1}$	**-0.032*** **	**Crisis $_{t-1}$**	**-0.015*** **
	(0.005)		(0.005)
Age $_t$	-0.001	**Skilled labor share^2 $_{t-1}$**	**0.082***
	(0.001)		(0.044)
Age $_t^2$	-0.000	Log TFP^2 $_{t-1}$	-0.097
	(0.000)		(0.079)
Log Capital per worker $_{t-1}$	-0.009	Δlog TFP^2 $_{t-1}$	-0.182
	(0.006)		(0.140)
Log Capital per worker $_{t-1}$ * Age	0.000***	log output $_{t-1}$ * log markup $_{t-1}$	0.003***
	(0.000)		(0.001)
		Observations	7163
		Pseudo R2	0.1598

T-test on the matched sample

	Treated	Control	t-test	p-value
Log TFP $_{t-1}$	2.3	2.3	0.69	0.49
Δlog TFP $_{t-1}$	0.0	0.0	-0.62	0.54
Log markup $_{t-1}$	1.7	1.6	0.29	0.77
Δlog markup $_{t-1}$	0.0	0.1	-0.51	0.61
Log Employment $_{t-1}$	5.7	5.7	0.11	0.91
Log Employment $_{t-1}^2$	34.2	34.2	0.02	0.99
Skilled labor share $_{t-1}$	0.2	0.2	0.63	0.53
Log Average wage $_{t-1}$	8.4	8.3	0.92	0.36
Imported input share $_{t-1}$	0.3	0.3	-1.08	0.28
Age $_t$	12.7	11.2	1.24	0.21
Age $_t^2$	315.2	252.9	0.73	0.47
Log Capital per worker $_{t-1}$	9.7	9.6	0.80	0.43
Log Capital per worker $_{t-1}$ * Age	129.7	108.3	1.53	0.13
Loan-financed investment$_{t-1}$/Output $_{t-1}$	0.1	0.1	-0.30	0.77
year	1999.5	1999.5	0.00	1.00
Log output $_{t-1}$	16.8	16.8	0.41	0.68
% Exported $_{t-1}$	39.7	46.5	-1.46	0.15
Log av. wage $_{t-1}$ * TFP $_{t-1}$	19.3	19.0	1.02	0.31
Log Capital per worker $_{t-1}$ * av. wage $_{t-1}$	82.8	80.4	0.97	0.33
log(investment +1)$_{t-1}$	7.3	8.0	-0.84	0.40
Log TFP $_{t-1}$ * % Exported $_{t-1}$	91.2	107.4	-1.48	0.14
crisis t-1	0.2	0.2	0.00	1.00
Skilled labor share^2 $_{t-1}$	0.1	0.1	0.59	0.56
Log TFP^2 $_{t-1}$	5.3	5.2	0.70	0.49
Δlog TFP^2 $_{t-1}$	0.0	0.0	-0.54	0.59
log output $_{t-1}$ * log markup $_{t-1}$	28.7	28.2	0.27	0.79

Lower productivity

	De-investment year	One year later	Two years later
		ln(TFP)	
ATT	**-0.035*** **	**-0.036*** **	**-0.036*** **
	(0.008)	(0.009)	(0.009)
Observations	330	330	330
R-squared	0.057	0.047	0.045

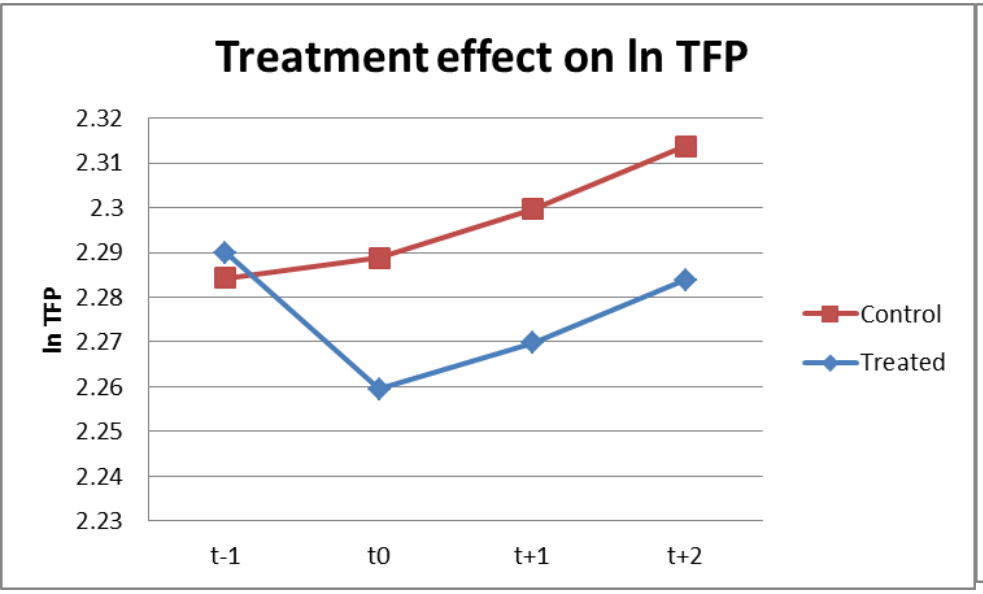
Lower productivity, lower output (the gap deepening over time)

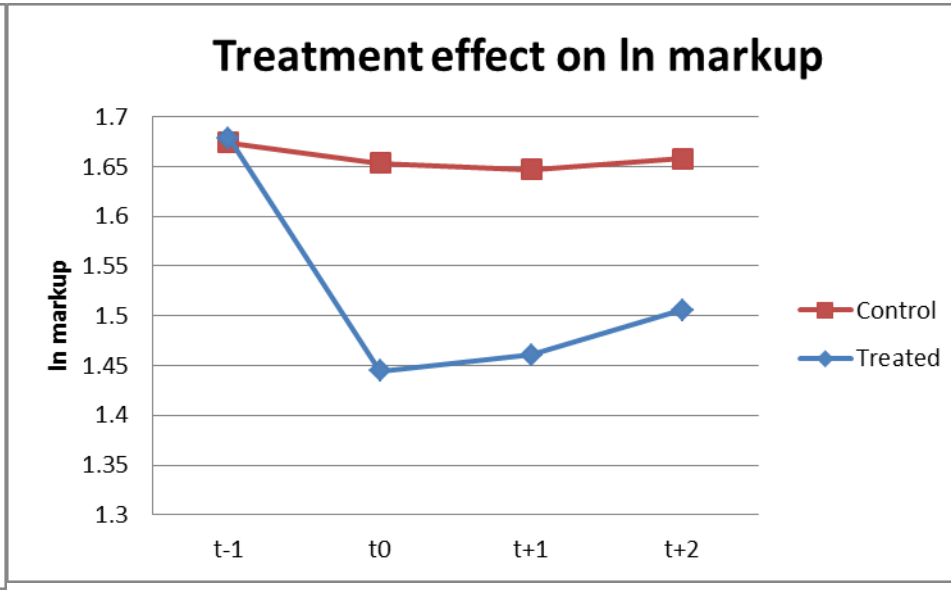
	De-investment year	One year later	Two years later
		ln(TFP)	
ATT	**-0.035*** **	**-0.036*** **	**-0.036*** **
	(0.008)	(0.009)	(0.009)
Observations	330	330	330
R-squared	0.057	0.047	0.045
		ln(Output)	
ATT	**-0.223***	**-0.354*** **	**-0.410*** **
	(0.117)	(0.124)	(0.132)
Observations	344	344	344
R-squared	0.011	0.023	0.028

Lower productivity, lower output, lower mark-ups

	De-investment year	One year later	Two years later
		ln(TFP)	
ATT	**-0.035*** **	**-0.036*** **	**-0.036*** **
	(0.008)	(0.009)	(0.009)
Observations	330	330	330
R-squared	0.057	0.047	0.045
		ln(Output)	
ATT	**-0.223***	**-0.354*** **	**-0.410*** **
	(0.117)	(0.124)	(0.132)
Observations	344	344	344
R-squared	0.011	0.023	0.028
		ln(Markup)	
ATT	**-0.214** **	**-0.192***	-0.157
	(0.089)	(0.100)	(0.104)
Observations	330	330	330
R-squared	0.017	0.010	0.007

Lower productivity and markups over time





Lower employment driven by production workers

	De-investment year	One year later	Two years later
	ln(Employment)		
ATT	**-0.175*** **	**-0.152*** **	**-0.114** **
	(0.057)	(0.057)	(0.055)
Observations	360	360	360
R-squared	0.026	0.020	0.011
	ln(Employment of production workers)		
ATT	**-0.217*** **	**-0.181*** **	**-0.135** **
	(0.061)	(0.062)	(0.062)
Observations	360	360	360
R-squared	0.034	0.023	0.012
	ln(Employment of non-production workers)		
ATT	-0.071	-0.108	-0.123
	(0.077)	(0.086)	(0.094)
Observations	338	338	338
R-squared	0.002	0.005	0.005

Lower wages

	De-investment year	One year later	Two years later
	ln(Average wage)		
ATT	**-0.129***	**-0.185****	**-0.219*****
	(0.066)	(0.080)	(0.083)
Observations	360	360	360
R-squared	0.010	0.015	0.021

Note: these results are not driven by a change in skill intensity

Not everything changes

- No effect on
  - the probability of exit
  - investment

Robustness checks

- Controlling for the crisis years
  - does not affect the results
  - recall: matching within industry-year cells
- Longer time horizon
  - comes at the price of fewer observations

Longer time horizon

	De-investment year	One year later	Two years later	Three years later	Four years later
			ln(TFP)		
ATT	**-0.021****	**-0.027*****	**-0.021***	**-0.021****	**-0.021***
	(0.009)	(0.011)	(0.011)	(0.011)	(0.011)
Observations	186	186	186	186	186
R-squared	0.029	0.035	0.017	0.020	0.017
			ln(Output)		
ATT	**-0.288***	**-0.417*****	**-0.370****	**-0.326***	**-0.326***
	(0.162)	(0.162)	(0.175)	(0.192)	(0.178)
Observations	190	190	190	190	190
R-squared	0.017	0.033	0.023	0.017	0.017
			Ln(Markup)		
ATT	-0.075	-0.197	-0.042	-0.083	-0.159
	(0.127)	(0.134)	(0.134)	(0.116)	(0.130)
Observations	186	186	186	186	186
R-squared	0.002	0.011	0.001	0.003	0.008

Longer time horizon

	De-investment year	One year later	Two years later	Three years later	Four years later
ln(Employment)					
ATT	**-0.131****	**-0.119***	-0.069	**-0.120***	-0.090
	(0.065)	(0.069)	(0.066)	(0.070)	(0.077)
Observations	198	198	198	198	198
R-squared	0.019	0.014	0.005	0.014	0.007
ln(Employment of production workers)					
ATT	**-0.158****	**-0.142***	-0.079	-0.109	-0.101
	(0.072)	(0.080)	(0.079)	(0.081)	(0.092)
Observations	198	198	198	198	198
R-squared	0.023	0.016	0.005	0.009	0.006
ln(Employment of non-production workers)					
ATT	-0.162	-0.122	-0.196	**-0.293****	**-0.288***
	(0.112)	(0.117)	(0.129)	(0.136)	(0.154)
Observations	182	182	182	182	182
R-squared	0.012	0.006	0.013	0.024	0.019

Longer time horizon

	De-investment year	One year later	Two years later	Three years later	Four years later
	ln(Average wage)				
ATT	**-0.219****	**-0.190***	**-0.282****	**-0.250****	-0.170
	(0.091)	(0.110)	(0.113)	(0.103)	(0.114)
Observations	198	198	198	198	198
R-squared	0.028	0.015	0.032	0.029	0.011

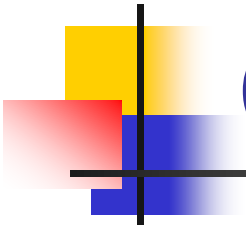
Divested plants are different from Indonesian plants

	ln(TFP)	ln(Output)	ln(Markup)	ln(Employment)	ln(Employment production)	ln(Employment non-production)
Divested	**0.005*** **	**0.049** **	**0.019***	**0.487*** **	**0.469*** **	**0.501*** **
	(0.001)	(0.019)	(0.012)	(0.031)	(0.031)	(0.031)
ln(Employment)	**-0.007*** **	**1.296*** **	**0.227*** **	X	X	X
	(0.001)	(0.009)	(0.003)			
Observations	331,948	364,997	331,775	393,074	389,374	338,236
R-squared	0.011	0.594	0.100	0.004	0.003	0.003

Even after controlling for size and industry affiliation (industry-year FE)

Divested plants are different from Indonesian plants

	ln(Domestic sales)	Share of output exported	Share of imported inputs	Skill intensity
Divested	**-0.269*** **	**5.495*** **	**0.045*** **	**0.009*** **
	(0.086)	(0.520)	(0.005)	(0.002)
ln(Employment)	**0.911*** **	**6.167*** **	**0.034*** **	**0.011*** **
	(0.036)	(0.233)	(0.001)	(0.001)
Observations	393,072	393,074	375,464	374,146
R-squared	0.043	0.069	0.035	0.007



Conclusions

- Bad news if you’re sold (and never re-acquired)