Former Foreign Affiliates: Cast Out and Outperformed?

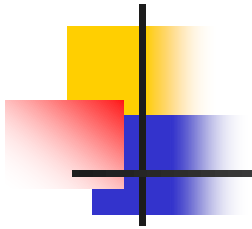
Beata Javorcik
University of Oxford and CEPR

Steven Poelhekke
VU University Amsterdam
and De Nederlandsche Bank

Is FDI special and thus worthy of a preferential treatment?

- "One dollar of FDI is worth no more (and no less) than a dollar of any kind of investment" (D. Rodrik 2003)

- Yet, 59 out of 108 countries surveyed in the World Bank's census of investment promotion agencies offered FDI incentives in 2004

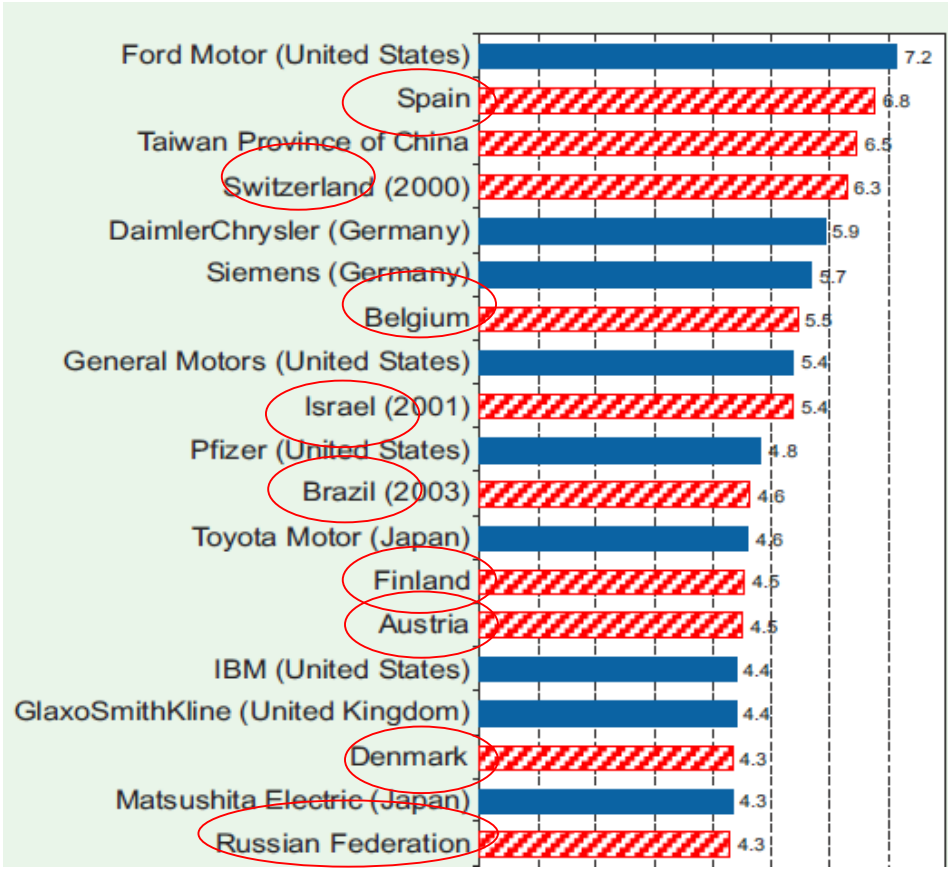


MNCs are special

MNCs are special

- MNCs are active in R&D and skilled labor intensive sectors (Markusen JEPersp 1995)
- MNCs are more productive than other firms (Helpman, Melitz and Yeaple AER 2004)
- 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

MNCs' R&D budgets may exceed R&D spending of countries (2002, $bn)



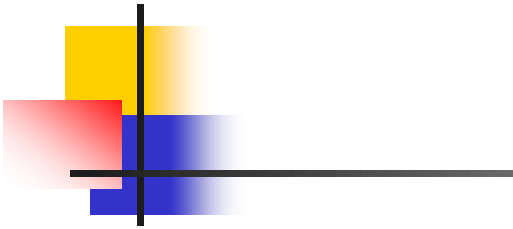
UNCTAD (WIR 2005)

MNCs are better managed
(Bloom and Van Reenen QJE 2007)

Average management score by firm type in the UK, France and Germany

MNCs transfer knowledge across international borders

- Arnold and Javorcik (JIE 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, export and import intensity



This study

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 it driven by continuous knowledge flows from the foreign parent?

Our contribution

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

- Apply a new methodology allowing for credible estimation of mark-ups and total factor productivity (de Loecker and Warzynski, AER 2012)

Preview of the results

- Divestment => dip in TFP, markups and output
- Divestment => lower export and import intensity

- Results consistent with the former affiliates losing access to parent's distribution networks, HQ services and expat managers

- Results in line with foreign affiliate advantage due to continuous injections of knowledge

Why should we 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

Empirical strategy

- **Difference-in-differences** approach

$$Outcome_{i,t+s} - Outcome_{i,t-1} = \Delta Outcome_{i,t+s} = \alpha + \beta Divested_i + \varepsilon_{it}$$

where s={0,1,2} and t=0 is the year of divestment

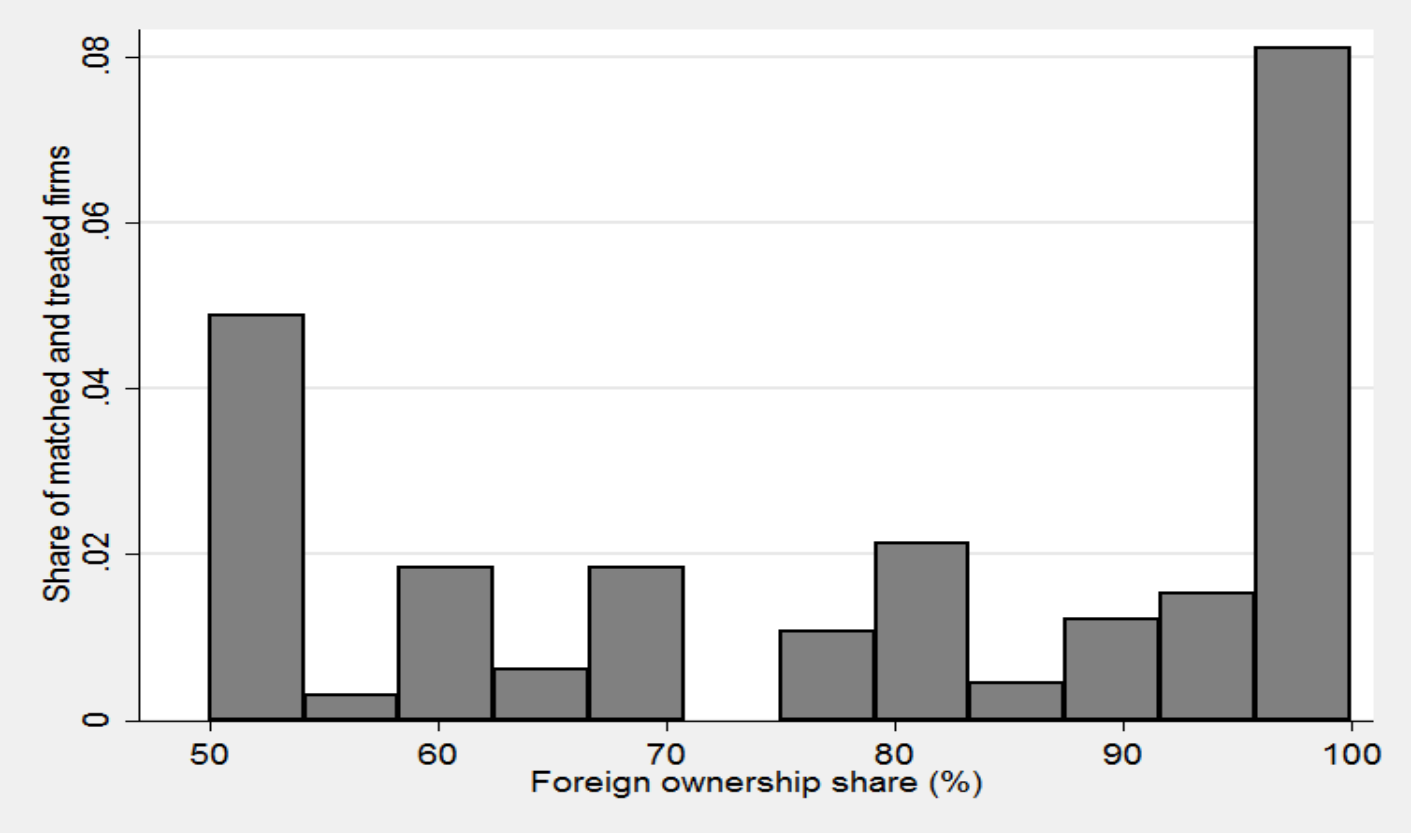
- Using propensity score matching to solve the problem of missing counterfactual

- **Control group**: foreign plants with similar observable characteristics operating in the same 4-digit industry-year cell

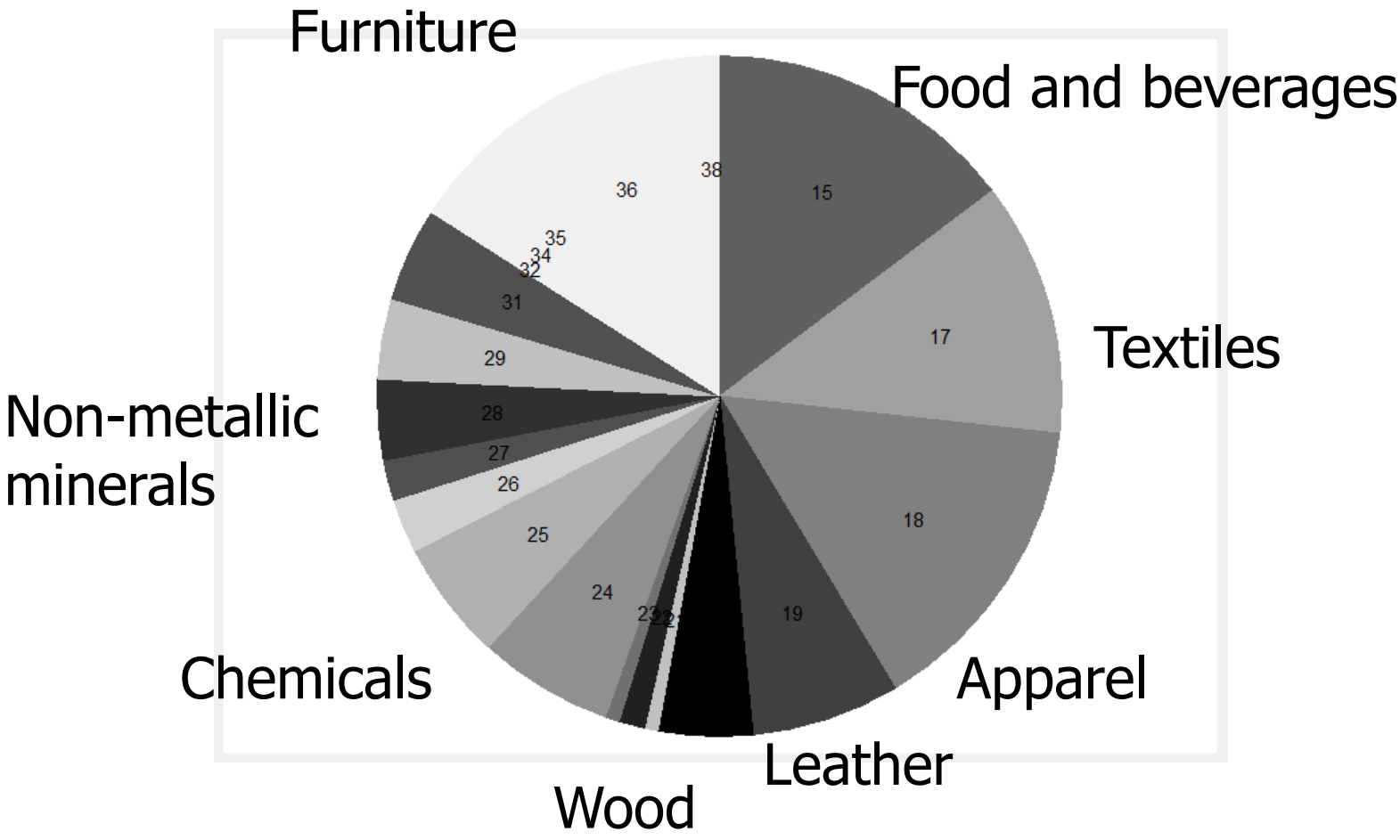
Data

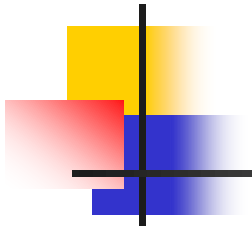
- Indonesian Manufacturing Census
  - 1990-2009
  - All plants with more than 20 employees
  - 157 cases of divestment with sufficiently complete data to make inferences
    - Ownership change from at least 50% foreign equity to less than 10% foreign equity
    - Traced for at least 5 consecutive years
    - Not re-acquired during this time period

Foreign ownership share prior to divestment



Divestments by sector





Why affiliates get divested?

Why affiliates get divested?

- Shocks to the parent company/home country
  - E.g., liquidating foreign assets to avoid bankruptcy at home
  - New management => focus on core activities
- Shocks to other countries where the MNCs operates
  - Relocating production to places with more promising prospects
- Affiliate characteristics
  - Greater scope for negative 'surprises' with projects established through acquisitions (vs greenfield) or JVs (vs fully owned)
  - Rising wages make labor-intensive production less attractive
  - Trade liberalization makes tariff-jumping FDI less attractive

Which affiliates get divested?

GDP growth	**0.028***					
	[0.015]					
Credit to private sector by banks (% GDP)	**0.003****					
	[0.001]					
Lending interest rate	**0.058*****					
	[0.015]					
GDP growth lagged		**0.050****	**0.055*****	**0.055*****	**0.057*****	**0.057*****
		[0.016]	[0.016]	[0.017]	[0.017]	[0.017]
Credit to private sector by banks (% GDP) lagged		**0.003****	**0.003****	**0.003****	**0.003****	**0.003****
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lending interest rate lagged		**0.047****	**0.044****	**0.048****	**0.048****	**0.047****
		[0.016]	[0.017]	[0.017]	[0.017]	[0.017]
Fully foreign owned lag			0.001	0.001	0.001	0.001
			[0.001]	[0.001]	[0.001]	[0.001]
Greenfield			**-0.355****	**-0.322****	**-0.309***	**-0.278***
			[0.148]	[0.157]	[0.158]	[0.159]
ln(output) lag				**-0.088*****	**-0.087*****	**-0.076****
				[0.026]	[0.026]	[0.027]
Share of output exported lagged					-0.001	-0.001
					[0.001]	[0.001]
Share of imported inputs lagged						**-0.258****
						[0.115]
Year fixed effects	yes	yes	yes	yes	yes	yes
No of obs	5080	5100	5100	4852	4852	4835
No of divestments	111	110	110	104	104	104

Which affiliates get divested?

GDP growth	**0.028***					
	[0.015]					
Credit to private sector by banks (% GDP)	**0.003****					
	[0.001]					
Lending interest rate	**0.058*****					
	[0.015]					
GDP growth lagged		**0.050****	**0.055*****	**0.055*****	**0.057*****	**0.057*****
		[0.016]	[0.016]	[0.017]	[0.017]	[0.017]
Credit to private sector by banks (% GDP) lagged		**0.003****	**0.003****	**0.003****	**0.003****	**0.003****
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lending interest rate lagged		**0.047****	**0.044****	**0.048****	**0.048****	**0.047****
		[0.016]	[0.017]	[0.017]	[0.017]	[0.017]
Fully foreign owned lag			0.001	0.001	0.001	0.001
			[0.001]	[0.001]	[0.001]	[0.001]
Greenfield			**-0.355****	**-0.322****	**-0.309***	**-0.278***
			[0.148]	[0.157]	[0.158]	[0.159]
ln(output) lag				**-0.088*****	**-0.087*****	**-0.076****
				[0.026]	[0.026]	[0.027]
Share of output exported lagged					-0.001	-0.001
					[0.001]	[0.001]
Share of imported inputs lagged						**-0.258****
						[0.115]
Year fixed effects	yes	yes	yes	yes	yes	yes
No of obs	5080	5100	5100	4852	4852	4835
No of divestments	111	110	110	104	104	104

Which affiliates get divested?

GDP growth	**0.028***					
	[0.015]					
Credit to private sector by banks (% GDP)	**0.003****					
	[0.001]					
Lending interest rate	**0.058*****					
	[0.015]					
GDP growth lagged		**0.050****	**0.055*****	**0.055*****	**0.057*****	**0.057*****
		[0.016]	[0.016]	[0.017]	[0.017]	[0.017]
Credit to private sector by banks (% GDP) lagged		**0.003****	**0.003****	**0.003****	**0.003****	**0.003****
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lending interest rate lagged		**0.047****	**0.044****	**0.048****	**0.048****	**0.047****
		[0.016]	[0.017]	[0.017]	[0.017]	[0.017]
Fully foreign owned lag			0.001	0.001	0.001	0.001
			[0.001]	[0.001]	[0.001]	[0.001]
Greenfield			**-0.355****	**-0.322****	**-0.309***	**-0.278***
			[0.148]	[0.157]	[0.158]	[0.159]
ln(output) lag				**-0.088*****	**-0.087*****	**-0.076****
				[0.026]	[0.026]	[0.027]
Share of output exported lagged					-0.001	-0.001
					[0.001]	[0.001]
Share of imported inputs lagged						**-0.258****
						[0.115]
Year fixed effects	yes	yes	yes	yes	yes	yes
No of obs	5080	5100	5100	4852	4852	4835
No of divestments	111	110	110	104	104	104

Which affiliates get divested?

GDP growth	**0.028***					
	[0.015]					
Credit to private sector by banks (% GDP)	**0.003****					
	[0.001]					
Lending interest rate	**0.058*****					
	[0.015]					
GDP growth lagged		**0.050****	**0.055*****	**0.055*****	**0.057*****	**0.057*****
		[0.016]	[0.016]	[0.017]	[0.017]	[0.017]
Credit to private sector by banks (% GDP) lagged		**0.003****	**0.003****	**0.003****	**0.003****	**0.003****
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lending interest rate lagged		**0.047****	**0.044****	**0.048****	**0.048****	**0.047****
		[0.016]	[0.017]	[0.017]	[0.017]	[0.017]
Fully foreign owned lag			0.001	0.001	0.001	0.001
			[0.001]	[0.001]	[0.001]	[0.001]
Greenfield			**-0.355****	**-0.322****	**-0.309***	**-0.278***
			[0.148]	[0.157]	[0.158]	[0.159]
ln(output) lag				**-0.088*****	**-0.087*****	**-0.076****
				[0.026]	[0.026]	[0.027]
Share of output exported lagged					-0.001	-0.001
					[0.001]	[0.001]
Share of imported inputs lagged						**-0.258****
						[0.115]
Year fixed effects	yes	yes	yes	yes	yes	yes
No of obs	5080	5100	5100	4852	4852	4835
No of divestments	111	110	110	104	104	104

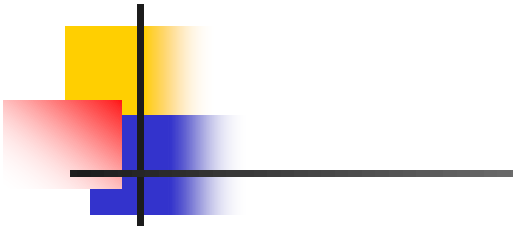
Which affiliates get divested?

GDP growth	**0.028***					
	[0.015]					
Credit to private sector by banks (% GDP)	**0.003****					
	[0.001]					
Lending interest rate	**0.058*****					
	[0.015]					
GDP growth lagged		**0.050****	**0.055*****	**0.055*****	**0.057*****	**0.057*****
		[0.016]	[0.016]	[0.017]	[0.017]	[0.017]
Credit to private sector by banks (% GDP) lagged		**0.003****	**0.003****	**0.003****	**0.003****	**0.003****
		[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Lending interest rate lagged		**0.047****	**0.044****	**0.048****	**0.048****	**0.047****
		[0.016]	[0.017]	[0.017]	[0.017]	[0.017]
Fully foreign owned lag			0.001	0.001	0.001	0.001
			[0.001]	[0.001]	[0.001]	[0.001]
Greenfield			**-0.355****	**-0.322****	**-0.309***	**-0.278***
			[0.148]	[0.157]	[0.158]	[0.159]
ln(output) lag				**-0.088*****	**-0.087*****	**-0.076****
				[0.026]	[0.026]	[0.027]
Share of output exported lagged					-0.001	-0.001
					[0.001]	[0.001]
Share of imported inputs lagged						**-0.258****
						[0.115]
Year fixed effects	yes	yes	yes	yes	yes	yes
No of obs	5080	5100	5100	4852	4852	4835
No of divestments	111	110	110	104	104	104

Which affiliates get divested

	100% lag	Greenfield	TFP lag	ΔTFP lag	Markup lag	ΔMarkup lag	Employment lag
Estimate	**0.0004*** **	**-0.012** **	-0.015	0.054	**-0.008*** **	0.004	**-0.021*** **
	[0.00004]	[0.005]	[0.025]	[0.034]	[0.002]	[0.003]	[0.002]
Industry-year FE	yes	yes	yes	yes	yes	yes	yes
R2	0.11	0.11	0.11	0.11	0.11	0.11	0.12
No of obs	14470	14470	13042	11339	13033	11323	14470
No of divestments	707	707	638	525	637	524	707

	Avg wage lag	Imported inputs lag	Age	K/L lag	Loan/output lag	Share exported lag	Inv lag
Estimate	**-0.017*** **	**-0.045*** **	**0.0005** **	**-0.008*** **	-0.0002	**-0.0004*** **	**-0.001** **
	[0.003]	[0.006]	[0.0001]	[0.001]	[0.0001]	[0.00005]	[0.0003]
Industry-year FE	yes	yes	yes	yes	yes	yes	yes
R2	0.11	0.12	0.11	0.12	0.11	0.11	0.11
No of obs	14460	13884	14470	9813	13466	14470	13461
No of divestments	705	675	707	509	674	707	677



Main analysis

Choosing the control group

- Estimate the probability of divestment at time *t* as a function of affiliate characteristics at *t-1*
- Match within industry-year cells
- Require common support
- Impose caliper of 3%

Choosing the control group

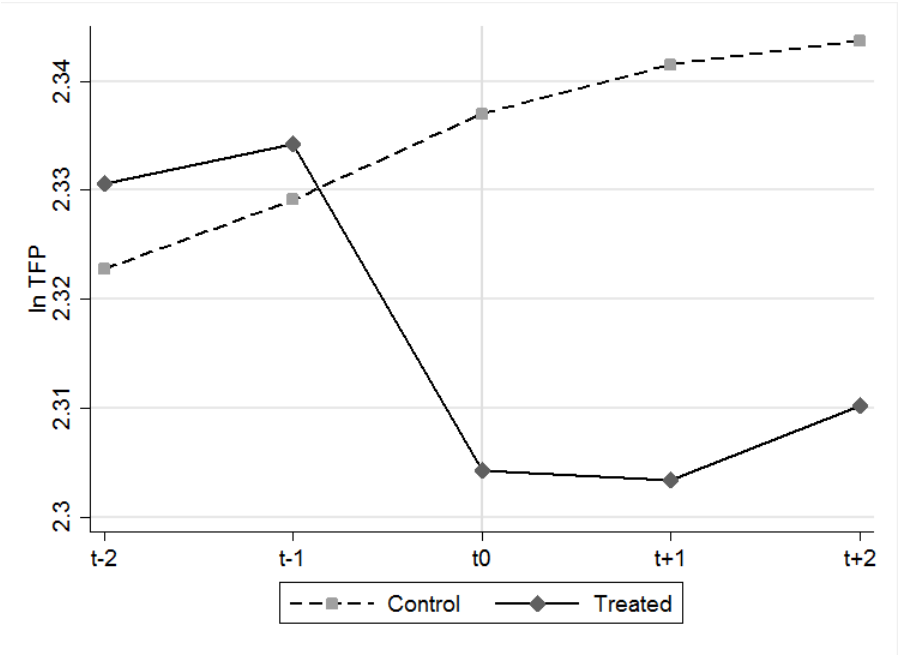
log TFP $_{t-1}$	0.017	log Capital per worker $_{t-1}$ * Age	0.000**
	(0.028)		(0.000)
Δlog TFP $_{t-1}$	**0.053***	Loan-financed investment$_{t-1}$/Output $_{t-1}$	-0.002
	(0.029)		(0.002)
log markup $_{t-1}$	**-0.033***	**log output $_{t-1}$**	**-0.033*****
	(0.017)		(0.007)
Δlog markup $_{t-1}$	0.001	% Exported $_{t-1}$	-0.001
	(0.003)		(0.001)
100% foreign owned $_{t-1}$	0.031***	log(investment +1)$_{t-1}$	0.002*
	(0.004)		(0.001)
Entered as greenfield $_{t-1}$	**-0.050*****	% Exported $_{t-1}$ * TFP $_{t-1}$	0.000
	(0.008)		(0.000)
log Employment $_{t-1}$	**-0.254*****	log avg. wage $_{t-1}$ * markup $_{t-1}$	0.001
	(0.057)		(0.002)
log Employment $_{t-1}^2$	0.033***	% Exported $_{t-1}$ * markup $_{t-1}$	-0.000
	(0.010)		(0.000)
log Employment $_{t-1}^3$	-0.002***	log output $_{t-1}$ * Skilled labor share $_{t-1}$	0.027***
	(0.001)		(0.006)
Skilled labor share $_{t-1}$	**-0.464*****	Crisis $_{t-1}$	-0.012**
	(0.103)		(0.005)
log Average wage $_{t-1}$	**-0.022*****	log markup^2 $_{t-1}$	0.003*
	(0.006)		(0.002)
Imported input share $_{t-1}$	**-0.030*****	log markup^3 $_{t-1}$	-0.000
	(0.005)		(0.000)
Age $_t$	-0.000	log(investment +1) $_{t-1}$ * log Employment $_{t-1}$	-0.000**
	(0.001)		(0.000)
Age $_t^2$	-0.000	log output $_{t-1}$ * log Employment $_{t-1}$	0.004***
	(0.000)		(0.001)
Age $_t^3$	0.000	Time trend	-0.001**
	(0.000)		(0.000)
log Capital per worker $_{t-1}$	**-0.004****	Observations	7,120
	(0.002)	Pseudo R2	0.200

T-test on the matched sample

	Treated	Control	t-test	p-value
log TFP $_{t-1}$	2.334	2.329	0.500	0.618
Δlog TFP $_{t-1}$	0.004	0.006	-0.460	0.649
log markup $_{t-1}$	1.782	1.800	-0.160	0.870
Δlog markup $_{t-1}$	0.074	0.002	0.720	0.473
100% foreign owned $_{t-1}$	0.312	0.325	-0.240	0.809
Entered as greenfield $_{t-1}$	0.076	0.064	0.440	0.660
log Employment $_{t-1}$	5.800	5.802	-0.020	0.987
log Employment $_{t-1}^2$	34.884	35.038	-0.100	0.920
log Employment $_{t-1}^3$	216.960	219.550	-0.180	0.857
Skilled labor share $_{t-1}$	0.195	0.183	0.630	0.528
log Average wage $_{t-1}$	8.747	8.742	0.050	0.957
Imported input share $_{t-1}$	0.325	0.341	-0.390	0.698
Age $_t$	13.197	12.019	0.850	0.397
Age $_t^2$	369.660	250.200	1.290	0.198
Age $_t^3$	18358.000	7732.300	1.500	0.134
log Capital per worker $_{t-1}$	10.227	10.258	-0.140	0.886
log Capital per worker $_{t-1}$ * Age	138.560	124.510	0.880	0.378
Loan-financed investment$_{t-1}$/Output $_{t-1}$	0.141	0.081	1.030	0.304
log output $_{t-1}$	17.250	17.257	-0.050	0.963
% Exported $_{t-1}$	40.290	42.051	-0.350	0.723
log(investment +1)$_{t-1}$	7.944	7.986	-0.050	0.962
% Exported $_{t-1}$ * TFP $_{t-1}$	93.774	98.050	-0.370	0.713
log avg. wage $_{t-1}$ * markup $_{t-1}$	14.931	15.506	-0.680	0.500
% Exported $_{t-1}$ * markup $_{t-1}$	67.030	66.143	0.080	0.934
log output $_{t-1}$ * Skilled labor share $_{t-1}$	3.354	3.146	0.640	0.524
Crisis $_{t-1}$	0.178	0.178	0.000	1.000
log markup^2 $_{t-1}$	4.3405	4.0441	0.45	0.651
log markup^3 $_{t-1}$	14.735	10.281	0.87	0.385
log(investment +1) $_{t-1}$ * log Employment $_{t-1}$	45.866	47.597	-0.32	0.752
log output $_{t-1}$ * log Employment $_{t-1}$	101.04	101.2	-0.05	0.959

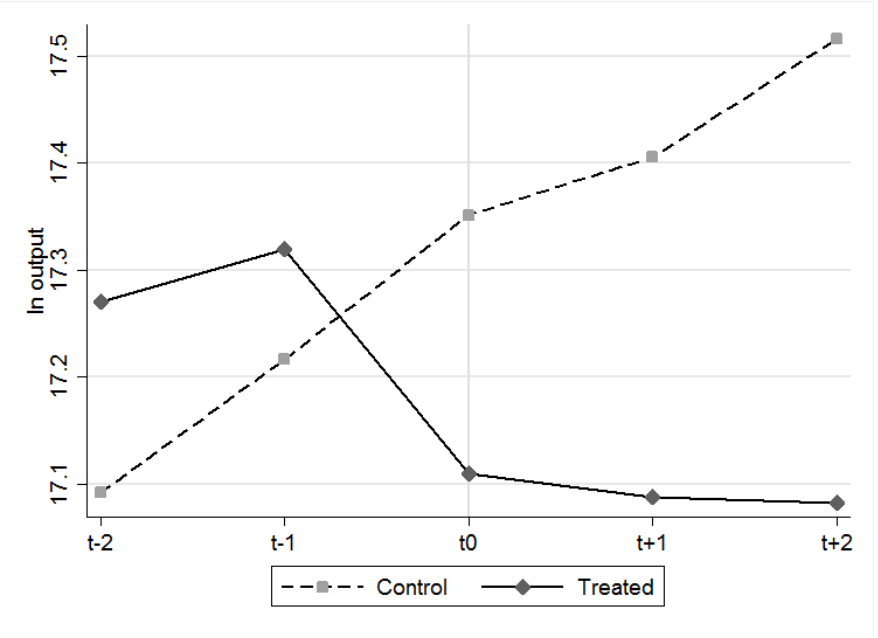
Divestment => Lower productivity

	Divestment year	One year later	Two years later
		ΔIn(TFP)	
Divestment	**-0.038***** (0.007)	**-0.043***** (0.007)	**-0.038***** (0.008)
Observations	314	314	314
R-squared	0.090	0.095	0.065



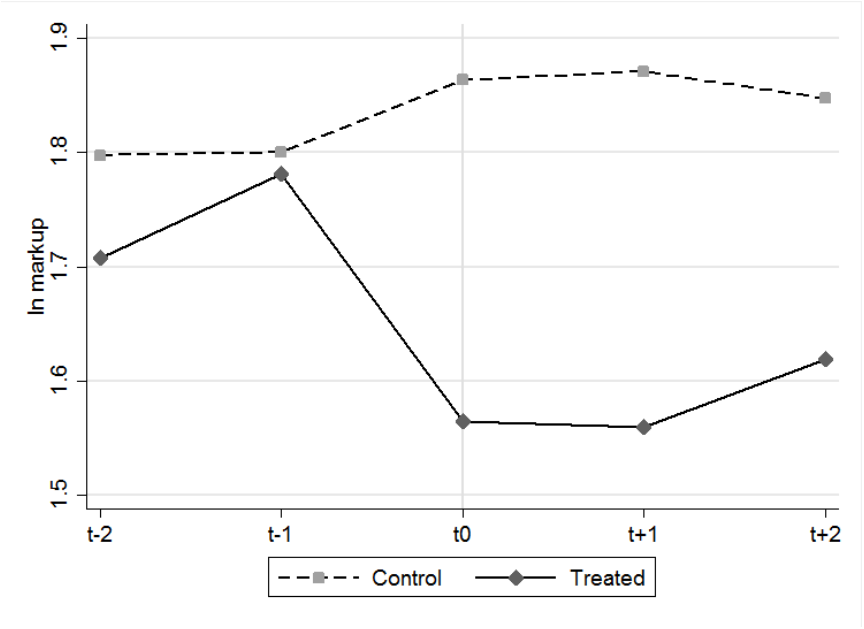
Divestment => Lower output

	Divestment year	One year later	Two years later
		ΔIn(Output)	
Divestment	**-0.345*** **	**-0.421*** **	**-0.537*** **
	(0.101)	(0.126)	(0.131)
Observations	328	328	328
R-squared	0.033	0.032	0.047



Divestment => Lower mark-ups

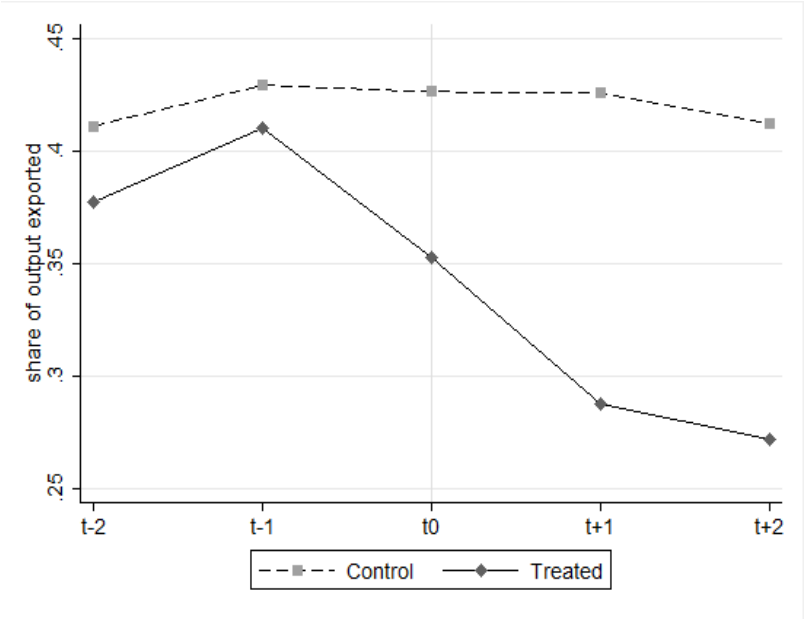
	Divestment year	One year later	Two years later
		Δln(Mark-up)	
Divestment	**-0.280*** **	**-0.293** **	**-0.210***
	(0.107)	(0.119)	(0.120)
Observations	314	314	314
R-squared	0.021	0.019	0.010

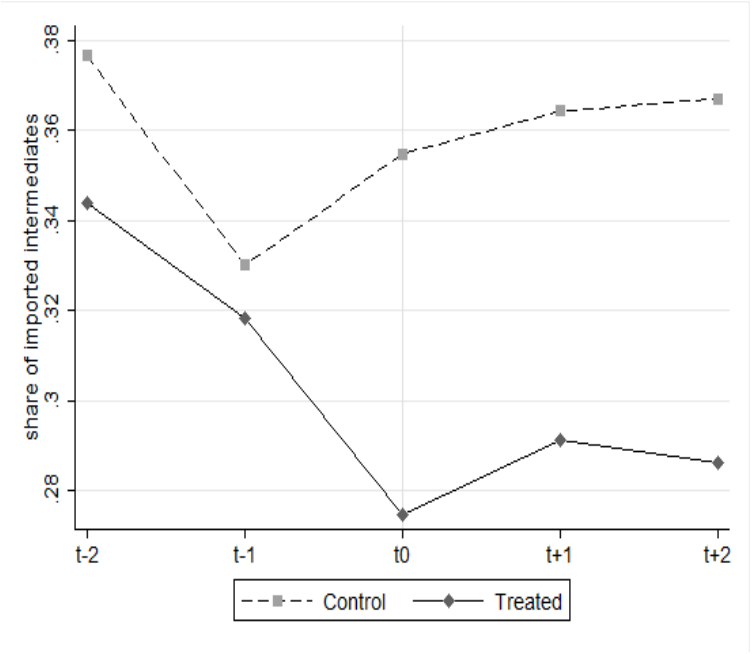


Divestment => Loss of export markets

	Divestment year	One year later	Two years later
		Δ Share of output exported	
ATT	-0.055	**-0.119*** **	**-0.121** **
	(0.040)	(0.046)	(0.049)
Observations	344	344	344
R-squared	0.005	0.019	0.018
		Δ log(Domestic sales +1)	
ATT	-0.304	0.416	0.749
	(0.714)	(0.772)	(0.856)
Observations	344	344	344
R-squared	0.001	0.001	0.002
		Δ Share of imported inputs	
ATT	**-0.068** **	**-0.061**	**-0.069** **
	(0.029)	(0.033)	(0.034)
Observations	338	338	338
R-squared	0.017	0.010	0.013

Share of exports and imports

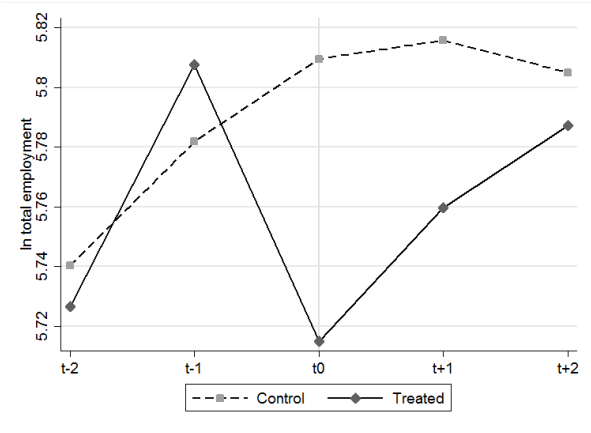




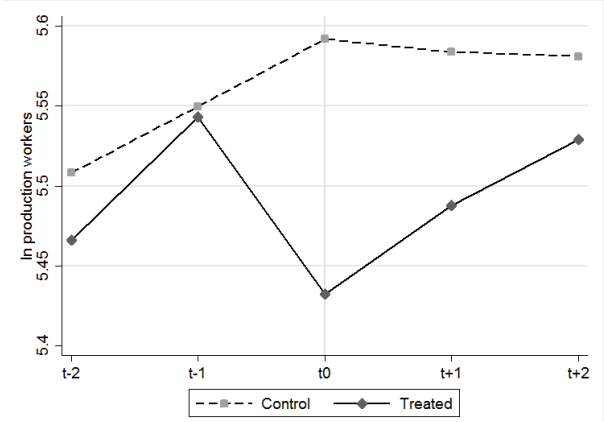
Divestment => Lower employment driven by production workers

	Divestment year	One year later	Two years later
		Δ ln(Employment)	
ATT	**-0.120****	-0.082	-0.043
	(0.051)	(0.051)	(0.052)
Observations	344	344	344
R-squared	0.016	0.007	0.002
		Δ ln(Employment of production workers)	
ATT	**-0.153*****	-0.089	-0.045
	(0.059)	(0.063)	(0.067)
Observations	344	344	344
R-squared	0.020	0.006	0.001
		Δ ln(Employment of non-production workers)	
ATT	-0.008	-0.059	-0.037
	(0.078)	(0.089)	(0.094)
Observations	322	322	322
R-squared	0.000	0.001	0.000

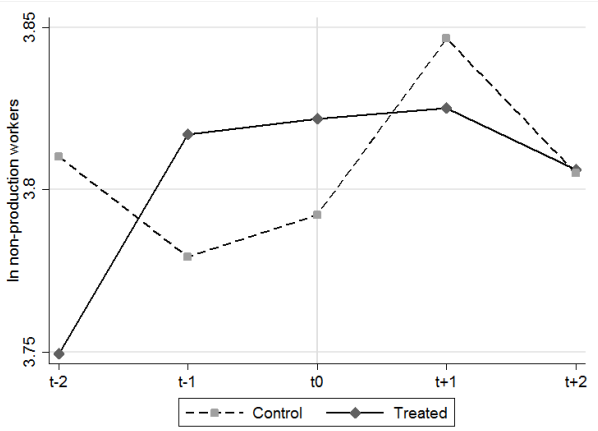
Divestment => Lower employment driven by production workers



Employment



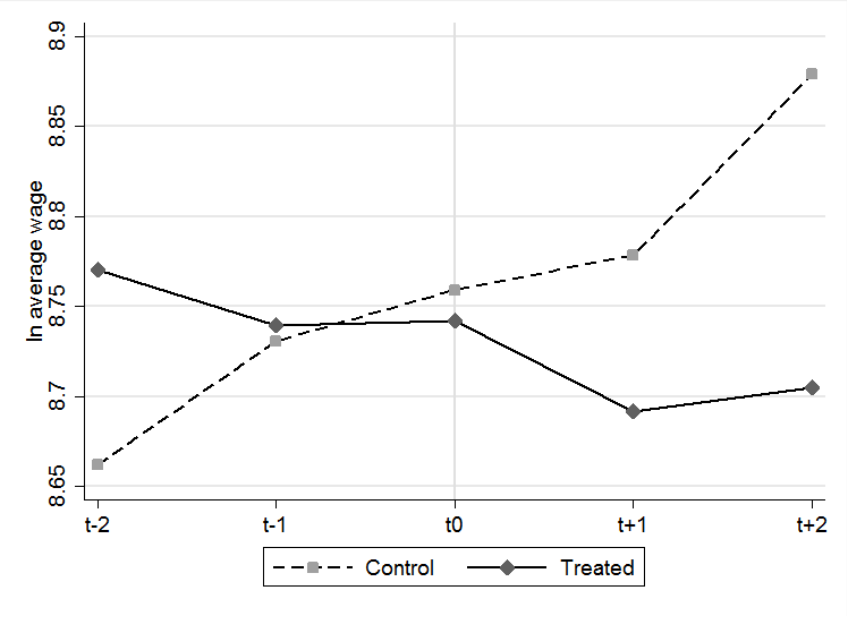
Production workers

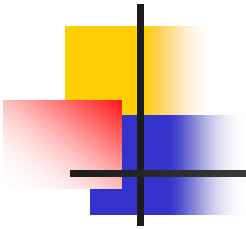


Non-production workers

Divestment => Lower wages

	De-investment year	One year later	Two years later
	Δ ln(Average wage)		
Divestment	-0.026	-0.095	**-0.183****
	(0.082)	(0.096)	(0.092)
Observations	344	344	344
R-squared	0.000	0.003	0.011





Not everything changes

- No effect on
  - the probability of exit
  - investment

Are our results driven by transfer pricing?

- The observed changes in employment suggest that the output decline is a real rather than an accounting phenomenon

- Indonesia has explicit regulation against transfer pricing in place since 1984, giving tax authorities the ability to adjust related party transactions (KPMG 2013)
  - In 1999 Indonesia was among only 32 countries in the world to have such rules (Merlo et al. 2014)
  - Thailand, for example, introduced such rules only in 2002 and China did not have comprehensive rules on transfer pricing until 2008 (KPMG 2013)

Are our results driven by transfer pricing?

- Stronger transfer pricing incentives for fully foreign-owned affiliates
  - In partially-owned affiliates, profits shifted to Indonesia have to be shared with the local partner

- In 49 out of 157 cases, the plant was fully foreign-owned before sale
- If transfer pricing is important, we should find stronger effects for such plants
- This is **not** what we find

Similar TFP drop for 100% foreign owned plants

	Divestment year	One year later	Two years later
		Δ log(TFP)	
Divestment	**-0.039*** **	**-0.041*** **	**-0.039*** **
	(0.009)	(0.010)	(0.010)
Divestment * 100% foreign	0.005	-0.006	0.002
	(0.014)	(0.015)	(0.016)
100% foreign	0.005	-0.000	0.006
	(0.008)	(0.010)	(0.011)
Observations	314	314	314
R-squared	0.094	0.095	0.066

Similar mark-up drop for 100% foreign owned plants

	Divestment year	One year later	Two years later
		Δ log(Mark-up)	
Divestment	**-0.292****	**-0.314****	-0.229
	(0.143)	(0.153)	(0.146)
Divestment * 100% foreign	0.037	0.064	0.057
	(0.219)	(0.235)	(0.246)
100% foreign	-0.030	-0.095	-0.084
	(0.122)	(0.133)	(0.153)
Observations	314	314	314
R-squared	0.021	0.020	0.011

Similar output drop for 100% foreign owned plants

	Divestment year	One year later	Two years later
		Δ log(Output)	
Divestment	**-0.372*** **	**-0.512*** **	**-0.674*** **
	(0.125)	(0.163)	(0.169)
Divestment * 100% foreign	0.096	0.291	0.424
	(0.213)	(0.264)	(0.283)
100% foreign	0.047	-0.077	-0.168
	(0.127)	(0.169)	(0.195)
Observations	328	328	328
R-squared	0.036	0.036	0.053

Non-exporters suffer as well

	Panel A			Panel B		
Sample=	Non-exporters at t-1			Exporters at t-1		
s=	t	t+1	t+2	t	t+1	t+2
Outcome	[1]	[2]	[3]	[5]	[6]	[7]
$\Delta_s$log(TFP)	**-0.034*** **	**-0.050*** **	**-0.040*** **	**-0.044*** **	**-0.040*** **	**-0.031*** **
$\Delta_s$log(Output)	**-0.342** **	-0.333	**-0.596*** **	**-0.393*** **	**-0.392** **	**-0.333***
$\Delta_s$log(Markup)	-0.128	-0.087	0.031	**-0.427** **	**-0.466*** **	-0.262
$\Delta_s$log(Domestic sales +1)	**-1.540** **	-0.138	-0.569	0.360	0.498	1.620
Δ_s(Share of imported inputs)	-0.034	0.025	-0.002	-0.040	-0.040	-0.075
$\Delta_s$log(Employment)	-0.038	0.026	-0.064	**-0.224** **	-0.144	-0.051
$\Delta_s$log(Employment of production workers)	-0.117	0.038	-0.049	**-0.198** **	-0.146	-0.040
$\Delta_s$log(Employment of non-production workers)	0.053	-0.053	-0.107	-0.169	-0.151	0.018
$\Delta_s$log(Average wage)	**-0.214** *	**-0.328** **	**-0.465*** **	0.096	0.114	0.016
Observations	134-146			142-156		

Loss of foreign managers/owners, not just management change

- Match foreign owned to public owned
  - Treatment = foreign divestment
  - Control = privatization
- Matching on TFP, markup, output
- 474 matches

Foreign divestment vs privatization

Δ_s=s-(t-1)	$\Delta_s$log(TFP)			$\Delta_s$log(Markup)			Δ_s(Share of output exported (%))		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	**-0.027*** **	**-0.031*** **	**-0.033*** **	**-0.193** **	**-0.212*** **	**-0.213*** **	**-0.094*** **	**-0.149*** **	**-0.114*** **
	(0.005)	(0.006)	(0.006)	(0.076)	(0.074)	(0.073)	(0.033)	(0.033)	(0.037)
Obs	474	474	474	472	472	472	514	514	514
R-squared	0.048	0.052	0.057	0.013	0.017	0.018	0.016	0.037	0.019

Δ_s=s-(t-1)	$\Delta_s$log(Employment)			Δs(Share of imported inputs)			$\Delta_s$log(Output)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	-0.046	-0.014	0.036	**-0.043***	-0.023	**-0.042***	0.178	0.139	0.126
	(0.053)	(0.058)	(0.062)	(0.023)	(0.023)	(0.023)	(0.108)	(0.103)	(0.111)
Obs	514	514	514	484	484	484	480	480	480
R-squared	0.001	0.000	0.001	0.007	0.002	0.007	0.006	0.004	0.002

Greenfield FDI

- Foreign affiliates set up through acquisitions of domestic plants may be more connected to the local business community, less reliant on HQ services and more likely to have home grown managers

- Divestment should be more disruptive for former foreign affiliates established as greenfield projects

Bigger TFP dip in former greenfield affiliates

	Divestment year		One year later		Two years later	
	Δ log(TFP)					
Divestment	**-0.035*** **	**-0.039*** **	**-0.040*** **	**-0.041*** **	**-0.033*** **	**-0.039*** **
	(0.007)	(0.009)	(0.008)	(0.010)	(0.008)	(0.011)
Divestment * Greenfield	-0.031	-0.040	**-0.045***	-0.048	**-0.078** **	**-0.091*** **
	(0.027)	(0.028)	(0.027)	(0.029)	(0.033)	(0.033)
Divestment * 100% foreign owned		0.013		0.005		0.021
		(0.013)		(0.014)		(0.018)
Greenfield	0.003	-0.001	-0.001	-0.001	0.044*	0.046**
	(0.010)	(0.011)	(0.014)	(0.016)	(0.023)	(0.023)
100% foreign owned		0.006		0.000		-0.003
		(0.009)		(0.010)		(0.012)
Observations	314	314	314	314	314	314
R-squared	0.098	0.107	0.110	0.111	0.082	0.087

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
- Larger sample/pre-trends
  - Matching with fewer controls but longer pre-trends, done within industry cells

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
- Larger sample/pre-trends
  - Matching with fewer controls but longer pre-trends, done within industry cells

Longer time horizon

	De-investment year	One year later	Two years later	Three years later	Four years later
			Δ ln(TFP)		
Divestment	**-0.032*** **	**-0.054*** **	**-0.039*** **	**-0.048*** **	**-0.043*** **
	(0.010)	(0.011)	(0.011)	(0.011)	(0.012)
Observations	206	206	206	206	206
R-squared	0.047	0.101	0.054	0.085	0.066
			Δ ln(Output)		
Divestment	-0.063	**-0.313** **	**-0.381** **	**-0.367** **	**-0.318***
	(0.119)	(0.142)	(0.154)	(0.162)	(0.173)
Observations	214	214	214	214	214
R-squared	0.001	0.022	0.026	0.022	0.016
			Δ ln(Mark-up)		
Divestment	-0.158	**-0.307** **	-0.188	**-0.264***	-0.224
	(0.115)	(0.131)	(0.136)	(0.143)	(0.149)
Observations	206	206	206	206	206
R-squared	0.009	0.027	0.010	0.017	0.011

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
- Larger sample/pre-trends
  - Matching with fewer controls but longer pre-trends, done within industry cells

Matching with longer pre-trends

- Match on levels as well as trends between *t-3* to *t-1*
- TFP, markup, output, employment and its square, % imported intermediates, % exported, and investment
- Matching within sector (not sector-year)
- Doubles sample size

Matching with longer pre-trends

Δ_s=s-(t-1)	$\Delta_s$log(TFP)			$\Delta_s$log(Output)			$\Delta_s$log(Markup)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	**-0.036*** **	**-0.031*** **	**-0.036*** **	**-0.292*** **	**-0.306*** **	**-0.425*** **	**-0.296*** **	**-0.286*** **	**-0.343*** **
	(0.006)	(0.006)	(0.007)	(0.086)	(0.095)	(0.102)	(0.069)	(0.074)	(0.076)
Obs	732	732	732	738	738	738	732	732	732

Δ_s=s-(t-1)	Δ_s(Share of output exported (%))			$\Delta_s$log(Domestic sales +1)			Δ_s(Share of imported inputs)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	-0.009	**-0.058** **	**-0.069** **	-0.734	-0.211	-0.535	**-0.045*** **	**-0.067*** **	**-0.069*** **
	(0.027)	(0.028)	(0.030)	(0.450)	(0.488)	(0.493)	(0.016)	(0.018)	(0.019)
Obs	768	768	768	768	768	768	742	742	742

Δ_s=s-(t-1)	$\Delta_s$log(Employment)			$\Delta_s$log(Empl. of production workers)			$\Delta_s$log(Average wage)		
s=	t	t+1	t+2	t	t+1	t+2	t	t+1	t+2
Divestment	**-0.078** **	**-0.127*** **	**-0.126*** **	**-0.082** **	**-0.127*** **	**-0.124** **	-0.015	-0.045	-0.040
	(0.037)	(0.040)	(0.043)	(0.041)	(0.042)	(0.048)	(0.061)	(0.073)	(0.067)
Obs	768	768	768	762	762	762	768	768	768

Conclusions

- Bad news if you're sold
  - Negative effect on TFP, markup, output, exports, imported intermediates and the average wage
  - A bigger dip in former greenfield affiliates
- Results consistent with the former affiliates being losing access to parent's distribution networks, HQ services and expat managers
- Results in line with foreign affiliate advantage due to continuous injections of knowledge