U.S. Multinational Strategies and the ASEAN Free Trade Area

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- This paper: empirical analysis of the behavior of multinational firms based in the U.S. around the time the signing of the ASEAN FTA (AFTA) in January of 1992.

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3. We test these predictions using very detailed firm-level data (U.S. BEA), as opposed to previous studies using aggregate data (for instance, Chen 2008).
4. We compare U.S. MNE behavior in ASEAN vs. NON-ASEAN countries in 1989 and 1994 (diff-in-diff strategy).

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  - among OECD countries reporting investment in the ASEAN region, the U.S. held a 22-27% share of aggregated investment position over the 1989-1994 period (only second to Japan).

Broad Patterns

- **Fact 1:** The signing of AFTA appears to have induced a surge in U.S. MNE activity in ASEAN countries relative to the rest of Asia.

Table 1

Effects on Aggregate Activity

This table presents measures of U.S. multinational aggregate activity in ASEAN and other Asian countries in 1989 and 1994. Number of Affiliates and Number of Parents are, respectively, the number of US MNE affiliates and parents operating in the region. Net PPE measures the net property, plant, and equipment of MNE affiliates. Growth rates are computed by taking the difference between 1994 and 1989 values and dividing by 1989 values.

	1989	1994	Growth Rate
ASEAN Countries			
Number of Affiliates	740	1,065	44%
Number of Parents	309	403	30%
Aggregate Sales	36,939,740	83,218,640	125%
Aggregate Assets	28,103,986	68,206,904	143%
Aggregate Employment Compensation	2,216,711	5,346,706	141%
Aggregate Net PPE	11,903,194	27,964,768	135%
Other Asian Countries			
Number of Affiliates	2,417	3,052	26%
Number of Parents	775	934	21%
Aggregate Sales	233,633,360	308,670,176	32%
Aggregate Assets	171,856,768	258,032,128	50%
Aggregate Employment Compensation	25,960,936	37,153,888	43%
Aggregate Net PPE	59,890,208	92,479,056	54%

Broad Patterns (cont.)

- **Fact 2:** Two-thirds of the surge appear to be a consequence of disproportionate growth in the intensive margin, and one-third is explained by disproportionate growth in the extensive margin (though we observe significant gross exit).

Table 2

Effects on Aggregate Activity: Intensive Margin

This table presents measures of U.S. multinational aggregate activity in ASEAN and other Asian countries in 1989 and 1994 for affiliates that report activity in both years. Number of Affiliates is the number of US MNE affiliates operating in the region. Net PPE measures the net property, plant, and equipment of MNE affiliates. Growth rates are computed by taking the difference between 1994 and 1989 values and dividing by 1989 values.

	1989	1994	Growth Rate
ASEAN Countries			
Number of Affiliates	507	507	0%
Aggregate Sales	31,365,546	67,467,664	115%
Aggregate Assets	22,387,278	49,965,720	123%
Aggregate Employment Compensation	1,806,404	3,898,378	116%
Aggregate Net PPE	9,720,393	19,589,564	102%
Other Asian Countries			
Number of Affiliates	1,591	1,591	0%
Aggregate Sales	181,131,168	256,260,880	41%
Aggregate Assets	131,140,912	201,230,736	53%
Aggregate Employment Compensation	20,550,656	30,694,388	49%
Aggregate Net PPE	46,193,692	69,387,904	50%

Table 3

Effects on Aggregate Activity: Extensive Margin

This table presents measures of U.S. multinational aggregate activity in ASEAN and other Asian countries in 1989 and 1994 for affiliates that report activity only in either 1989 or 1994. The first column provides 1989 aggregates for affiliates that exit the sample after 1989 and before 1994, and the second column provides 1994 aggregates for affiliates that enter the sample after 1989 and before 1994. Number of Affiliates is the number of US MNE affiliates operating in the region. Net PPE measures the net property, plant, and equipment of MNE affiliates.

	Exiting Affiliate 1989 Activity	Entering Affiliate 1994 Activity
ASEAN Countries		
Number of Affiliates	233	558
Aggregate Sales	5,574,194	15,750,973
Aggregate Assets	5,716,708	18,241,180
Aggregate Employment Compensation	410,307	1,448,328
Aggregate Net PPE	2,182,801	8,375,202
Other Asian Countries		
Number of Affiliates	826	1,461
Aggregate Sales	52,502,180	52,409,312
Aggregate Assets	40,715,852	56,801,392
Aggregate Employment Compensation	5,410,280	6,459,498
Aggregate Net PPE	13,696,517	23,091,148

Broad Patterns (cont.)

- **Fact 3:** AFTA increased the share of sales to third countries for affiliates in the ASEAN region relative to affiliate in the rest of Asia ($28.3\% \rightarrow 32.5\%$ vs. $12.8\% \rightarrow 11.2\%$)

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- **Fact 4:** Differential aggregate growth in third market sales is due to (i) "surviving" affiliates selling more to third markets, (ii) new entrants selling disproportionately more to third markets (41.2%), (iii) exiters selling disproportionately less to third markets than exiters in other Asian countries.

Panel A: All Affiliate Activity	1989	1994
ASEAN Countries		
Share of Sales to the Host Country Market	45.8%	47.1%
Share of Sales to the US	25.9%	20.4%
Share of Sales to Third Countries	28.3%	32.5%
Other Asian Countries		
Share of Sales to the Host Country Market	78.6%	83.1%
Share of Sales to the US	8.6%	5.7%
Share of Sales to Third Countries	12.8%	11.2%

Panel B: Surviving Affiliates	1989	1994
ASEAN Countries		
Share of Sales to the Host Country Market	43.8%	45.9%
Share of Sales to the US	28.4%	21.9%
Share of Sales to Third Countries	27.8%	32.2%
Other Asian Countries		
Share of Sales to the Host Country Market	79.9%	81.5%
Share of Sales to the US	9.0%	6.1%
Share of Sales to Third Countries	11.1%	12.4%

Panel C: Entrants and Exits	Exiting Affiliates 1989 Activity	Entering Affiliate 1994 Activity
ASEAN Countries		
Share of Sales to the Host Country Market	46.5%	41.2%
Share of Sales to the US	20.1%	17.6%
Share of Sales to Third Countries	33.3%	41.2%
Other Asian Countries		
Share of Sales to the Host Country Market	74.4%	85.0%
Share of Sales to the US	9.6%	4.8%
Share of Sales to Third Countries	16.0%	10.1%

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- There is a continuum of firms based in the West, which we index by their heterogeneous productivity level φ, and we let the cumulative distribution function of productivity be $G(\varphi)$.

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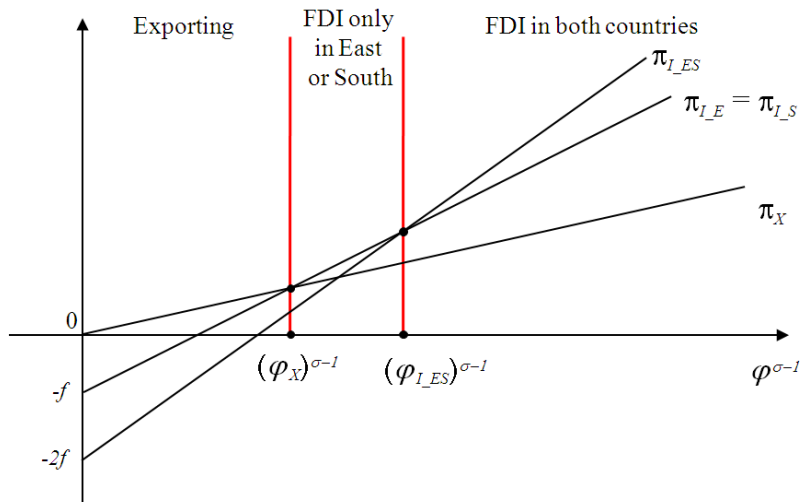
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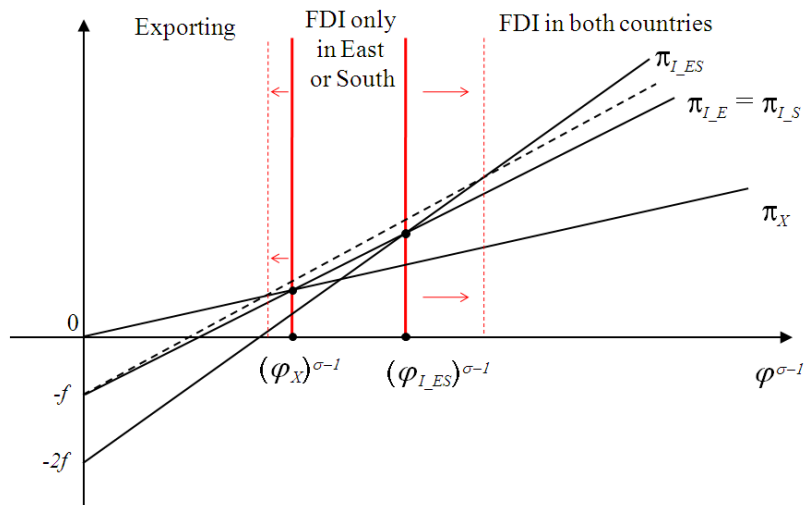$$c\left(\varphi\right) = \frac{w^{\varrho}}{\varphi}.$$

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- We shall interpret a regional trade agreement between East and South as a drop in $\underline{\tau}$, holding $\overline{\tau}$ constant.

Sorting of Firms into Organizational Modes

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- **Prediction 3:** Conditional on survival, an FTA between the East and the South will (weakly) increase economic activity (in terms of sales, output, employment, and employment compensation) at the affiliate level.

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  - First, because new (affiliate) entrants into the South-East area sell more to third markets than the *average* Western-owned plant in the area.

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  - Second, because firms that consolidate their two affiliates into one, now have affiliates with positive sales to third markets (and they did not before).
  - Third, because firms with only one affiliate before and after the FTA also increase the share of affiliate sales going to third markets.

Econometric Evidence

Table 6

Affiliate Level Responses

This table presents the results of specifications explaining measures of US MNE affiliate growth computed using data at the affiliate level. The dependent variable is sales growth in the first two columns, asset growth in the second two columns, employment compensation in the third two columns, and growth in net property plant and equipment in the last two columns. The ASEAN Dummy is equal to one for ASEAN members and zero for other Asian countries. Per Capita GDP Growth measures the growth of GDP per capita in constant dollar terms. Changes in Tax Rate measures the change in the tax rate paid on corporate income by US MNEs. All growth rates are measured by taking the difference between end and beginning of period values and dividing by the average of end and beginning of period values. Heteroskedasticity consistent standard errors that allow for clustering by country appear in parentheses.

Dependent Variable:	Sales Growth		Asset Growth		Employment Compensation Growth		Net PPE Growth	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ASEAN Dummy	0.1638	0.0842	0.2014	0.1829	0.2118	0.1380	0.1520	0.1738
	(0.0630)	(0.0383)	(0.0601)	(0.0546)	(0.0961)	(0.0737)	(0.1009)	(0.0853)
Per Capita GDP Growth		0.6323		0.1634		0.6064		-0.1468
		(0.1941)		(0.2064)		(0.3133)		(0.1760)
Changes in Tax Rate		0.9047		0.6883		1.0420		0.5478
		(0.8479)		(0.7199)		(1.0668)		(1.2317)
Constant	0.3654	0.3116	0.3690	0.3681	0.4274	0.3806	0.2853	0.3195
	(0.0486)	(0.0627)	(0.0503)	(0.0617)	(0.0800)	(0.0962)	(0.0814)	(0.1001)
No. of Obs.	2,090	2,090	2,090	2,090	2,023	2,023	2,068	2,068
R-Squared	0.011	0.034	0.021	0.025	0.016	0.035	0.006	0.006

Econometric Evidence

Table 7

Country/Industry Level Responses

This table presents the results of specifications explaining measures of US MNE affiliate growth computed using data at the country/industry level. The dependent variable is sales growth in the first two columns, asset growth in the second two columns, employment compensation in the third two columns, and growth in net property plant and equipment in the last two columns. The ASEAN Dummy is equal to one for ASEAN members and zero for other Asian countries. Per Capita GDP Growth measures the growth of GDP per capita in constant dollar terms. Changes in Tax Rate measures the change in the tax rate paid on corporate income by US MNEs. All growth rates are measured by taking the difference between end and beginning of period values and dividing by the average of end and beginning of period values.

Dependent Variable:	Sales Growth		Asset Growth		Employment Compensation Growth		Net PPE Growth	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ASEAN Dummy	0.2214	0.1213	0.2530	0.2178	0.3085	0.2082	0.3027	0.3095
	(0.1125)	(0.0914)	(0.0759)	(0.0857)	(0.1100)	(0.0850)	(0.0941)	(0.1079)
Per Capita GDP Growth		1.1134		0.4645		1.2034		0.0999
		(0.4337)		(0.4094)		(0.3575)		(0.4875)
Changes in Tax Rate		-0.0679		0.3763		0.5470		0.9626
		(1.2377)		(1.1181)		(0.9244)		(1.5739)
Constant	0.4071	0.2285	0.4282	0.3610	0.4215	0.2395	0.3975	0.3991
	(0.0690)	(0.0609)	(0.0602)	(0.0553)	(0.0745)	(0.0591)	(0.0830)	(0.0887)
No. of Obs.	665	665	665	665	662	662	664	664
R-Squared	0.017	0.044	0.022	0.028	0.030	0.065	0.022	0.025

Table 8

Decomposition of Sales Growth

This table presents the results of specifications explaining components of the growth of US MNE affiliates measured using data at the affiliate level. The dependent variable is growth in sales due to local sales in the first two columns, the growth in sales due to sales to the US in the second two columns, and the growth in sales due to sales to countries other than the US and the affiliate's host country in the last two columns. The ASEAN Dummy is equal to one for ASEAN members and zero for other Asian countries. The Dummy if in one ASEAN country in 1994 is a dummy equal to one for firms that were active in only one ASEAN country in 1994. Per Capita GDP Growth measures the growth of GDP per capita in constant dollar terms. Changes in Tax Rate measures the change in the tax rate paid on corporate income by US MNEs. All growth rates are measured by taking the difference between end and beginning of period values and dividing by the average of end and beginning of period values. Heteroskedasticity consistent standard errors that allow for clustering by country appear in parentheses.

Dependent Variable:	Growth in Sales Due to Local Sales		Growth in Sales Due to US Sales		Growth in Sales Due to Third Country Sales	
	(1)	(2)	(3)	(4)	(5)	(6)
ASEAN Dummy	-0.0018	0.0274	0.0224	0.0230	0.0391	0.0284
	(0.0564)	(0.0524)	(0.0106)	(0.0132)	(0.0382)	(0.0368)
ASEAN Dummy*Dummy if in one Asean country in 1994		-0.1622		-0.0035		0.0593
		(0.1110)		(0.0317)		(0.0237)
Per Capita GDP Growth	0.5002	0.5134	0.0684	0.0687	0.1989	0.1941
	(0.1667)	(0.1591)	(0.0333)	(0.0324)	(0.1677)	(0.1650)
Changes in Tax Rate	0.6840	0.6439	-0.0719	-0.0728	0.3278	0.3425
	(0.6291)	(0.6208)	(0.1434)	(0.1424)	(0.3479)	(0.3420)
Constant	0.2327	0.2299	-0.0008	-0.0008	0.0497	0.0508
	(0.0449)	(0.0441)	(0.0091)	(0.0090)	(0.0381)	(0.0377)
No. of Obs.	1,620	1,620	1,620	1,620	1,620	1,620
R-Squared	0.020	0.024	0.003	0.003	0.014	0.015

Table 9

Direction of Sales of New Affiliates

This table presents the results of specifications explaining the direction of sales of new affiliates. The sample includes affiliates in ASEAN and other Asian countries that appear in the data in 1994 but not in 1989. The dependent variable is the share of sales to persons in the affiliate's host country in the first two columns, the share of sales to persons in the US in the second two columns and the share of sales to persons in countries other than the US and the affiliate's host country in the last two collumns. The ASEAN Dummy is equal to one for ASEAN members and zero for other Asian countries. The New Affiliate Dummy is equal to one for all new affiliates in columns 1, 3, and 5. In columns 2, 4, and 6, for affiliates in ASEAN countries, it is equal to one for new affiliates of firms that operate in only one ASEAN country in 1994, and for affiliates in other Asian countries, it is equal to one for all new affiliates. Log of Per Capita GDP is the log of per capita GDP, and Tax Rate measures the corporate income tax rate. Heteroskedasticity consistent standard errors that allow for clustering by country appear in parentheses.

Dependent Variable:	Share of Sales to Local Market		Share of Sales to US		Share of Sales to Third Countries	
	(1)	(2)	(3)	(4)	(5)	(6)
ASEAN Dummy	-0.1787	-0.1368	0.0582	0.0410	0.1205	0.0958
	(0.0524)	(0.0555)	(0.0180)	(0.0193)	(0.0419)	(0.0413)
New Affiliate Dummy	0.0314	0.0319	-0.0091	-0.0093	-0.0223	-0.0226
	(0.0245)	(0.0245)	(0.0106)	(0.0106)	(0.0143)	(0.0143)
ASEAN Dummy*	0.0216	-0.1220	-0.0121	0.0482	-0.0095	0.0738
New Affiliate Dummy	(0.0309)	(0.0812)	(0.0119)	(0.0497)	(0.0210)	(0.0371)
Log of Per Capita GDP	-0.0388	-0.0371	0.0105	0.0098	0.0283	0.0273
	(0.0125)	(0.0126)	(0.0052)	(0.0054)	(0.0104)	(0.0103)
Tax Rate	0.7745	0.7662	-0.2061	-0.2026	-0.5684	-0.5636
	(0.1873)	(0.1899)	(0.0843)	(0.0859)	(0.1137)	(0.1148)
Constant	0.9495	0.9356	0.0251	0.0310	0.0254	0.0333
	(0.0956)	(0.0951)	(0.0422)	(0.0438)	(0.0824)	(0.0815)
In Asean countries, new affiliates include all new affiliates?	Y	N	Y	N	Y	N
In Asean countries, new affiliates include all new affiliates of firms operating in one Asean country in 1994?	N	Y	N	Y	N	Y
No. of Obs.	3,299	2,062	2,062	2,062	1,996	1,996
R-Squared	0.103	0.035	0.020	0.029	0.016	0.040

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- These findings are consistent with the predictions of a model of horizontal FDI with intraindustry heterogeneity in productivity.