Large Firms in the Global Economy

Julien Martin[1]

[1]UQAM & CEPR

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Table of Contents

1. Introduction

2. Exposure to and transmission of foreign shocks

3. Corporate tax avoidance

4. Conclusion

Novo Nordisk

- Danish drugmaker making diabete medications.
- 2021: medication is also an effective weight-loss treatment!
- 2022: (positive) shock on Novo Nordisk sales.
- 2023: main driver of Danish growth, Danish exports, and the main tax payer.
  → Market value reaches Danish GDP...

Outsized role of large firms in countries' GDP

- Novo Norsdik in Denmark or Nokia in Finland are not exception.
- Korea: Samsung & Hyunday, 22% make GDP.
- Intel literally changed the comparative advantages of Costa Rica.

→ Top 100 French firms: 40% of exports, 65% of value-added, 15% of employment.

→ Top 100 US firms: 30% of US GDP, and growing ....

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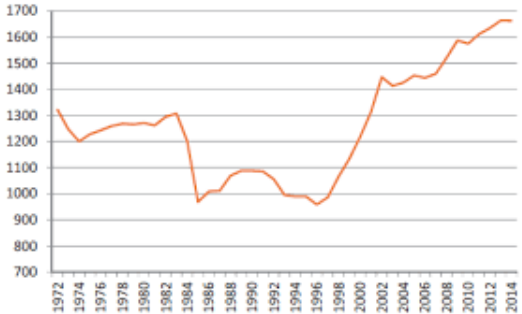
Growing dominance of large firms in the US (Herfindahl index)



Source: Grullon et al. (2018).

These large firms have international ties

- Novo Nordisk operates in dozens of countries and sell products all over the world (US is their biggest market) → expose Denmark to foreign shocks.
- It seems they pay a fair amount of taxes in Denmark – but not the case of big US pharma with a big presence in Ireland and other tax havens.

⇒ *About int'l ties:* top 1% largest firms in firms export, import, and **90% are part of multinational corporations**.

⇒ *About tax havens:* **half of US profits made abroad are reported in tax havens**.

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Today

An examination of the local influence of large internationalized firms along two dimensions:

1. How do the local footprint of large firms and their international networks shape the exposure to and the transmission of foreign shocks?

2. How do the international networks of large firms foster corporate tax avoidance and reinforce their economic dominance?

Table of Contents

1. Introduction

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The granular origins of fluctuations (Gabaix, ECTA 2011)

- Macro before Gabaix (2011): law of large number implies that firm-specific shocks should cancel out in the aggregate $\rightarrow$ fluctuations are driven by macro shocks.
- Gabaix (2011): if the distribution of firms is skewed enough (a few giant firms and a myriad of small firms) the law of large number does not apply $\rightarrow$ **individual shocks to large firms have aggregate impacts**.
- Preliminary exploration: idiosyncratic shocks to top 100 firms in the US explain 1/3 of GDP fluctuations.

di Giovanni, Levchenko, Mejean (ECTA 2014)

- Test Gabaix (2011) with the highly detailed French firm-level data:
  - → firm level growth: $g_{ft} = \delta_t + \epsilon ft$
  - → aggregate growth: $g_t = \delta_t + \sum_f w_f \epsilon ft$
- Contribution of aggregate vs individual shocks to fluctuation in French GDP?

di Giovanni, Levchenko, Mejean (ECTA, 2014)

	I. Total Sales			
	Whole Economy		*Manufacturing Sector*	
	(1) St. Dev.	(2) Relative SD	(3) St. Dev.	(4) Relative SD
Actual	0.0206	1.0000	0.0244	1.0000
Firm-Specific	0.0165	0.8010	0.0168	0.6885
Sector-Destination	0.0109	0.5291	0.0157	0.6434

$\Rightarrow$ Firm-specific shocks contribute as much as macro shocks to aggregate fluctuations

Kramarz, Martin, Mejean (JIE 2020)

- Trade and volatility: specialization *vs* diversification.
- Firms' exports are the combination of common shocks, firm-specific shocks, and shocks specific to its trade partners:

$$g_{sbt} = \gamma_t + \gamma_{st} + \gamma_{bt} + \gamma_{bst}$$

- How much do these shocks contribute to the volatility of exports at the firm-level - *in the small*? at the aggregate level - *in the large*?
- Novelty: rich data on firm-to-firm relationships underlying French exports.

Volatility in the small

	Mean	%Change
Actual volatility $Var(g_{s,t})$	0.192	
Volatility when muting		
Aggregate shocks $Var(.\|\varepsilon_{ji,t} = 0)$	0.191	-0.007
Seller-specific shocks $Var(.\|\varepsilon_{s,t} = 0)$	0.106	-0.447
Buyer-related shocks $Var(.\|\varepsilon_{b,t}, \varepsilon_{sb,t} = 0)$	0.097	-0.495
One buyer-related shock after the other		
Buyer-specific $Var(.\|\varepsilon_{b,t} = 0)$	0.146	-0.238
Match-specific $Var(.\|\varepsilon_{sb,t} = 0)$	0.151	-0.214

Notes: Table gives summary stat. on the actual and *counterfactual* levels of firm-level volatility, at the mean of the distribution. The *counterfactuals* are obtained by muting different shocks one after the other.

$\Rightarrow$ Micro origins of micro volatility.

Volatility in the large

	Bilateral		Multilateral	
	Variance	%Change	Variance	%Change
	(1)	(2)	(3)	(4)
Actual variance $Var(.)$	0.0042		0.0015	
Mute				
Aggregate shocks $Var(.\|\varepsilon_{ji,t}=0)$	0.0026	-0.382	0.0006	-0.620
Micro. shocks $Var(.\|\varepsilon_{s,t},\varepsilon_{b,t},\varepsilon_{sb,t}=0)$	0.0008	-0.803	0.0004	-0.741
Seller-specific shocks $Var(.\|\varepsilon_{s,t}=0)$	0.0035	-0.140	0.0010	-0.336
Buyer-specific $Var(.\|\varepsilon_{b,t}=0)$	0.0044	-0.110	0.0012	-0.173
Match-specific $Var(.\|\varepsilon_{sb,t}=0)$	0.0030	-0.177	0.0013	-0.161
Granularity $Var(.\|w_{sb,t}=w_t)$	0.0008	-0.809	0.0004	-0.741

Notes: Table gives summary stat. on the actual and *counterfactual* levels of agrgegate volatility of bilateral and multilateral exports. The *counterfactuals* are obtained by muting different shocks one after the other.

$\Rightarrow$ Micro shocks matter in the large, including individual shocks to foreign buyers.

Kramarz, Martin, Mejean (2020): Take-away

- Exports are highly concentrated: large impact of individual shocks to large exporters.
- Large exporters are not highly diversified: shocks to their trade partners matter.

→ Trade and production are exposed to (foreign) shocks.

→ Greater diversification might be obtained by promoting medium size firms and giving incentives to large firms to diversify their buyers' portfolio.

Kleinert, Martin, Toubal (AEJ: Macro 2015)

- What about large firms' role in the international transmission of shocks?
- International transmission of shocks is at the core of international macro: e.g. what is the impact of a natural disaster in Germany on Lithuania's economy?
- Literature looked at the question from a macro perspective, emphasizing the role of (aggregate) trade flows.
- Kleinert, Martin, Toubal (2015) apply the granularity concept to the question of co-fluctuations: if a firms has ties in two countries it may transmit shocks from one country to another → **if the firm is large enough it affects both GDPs and participate to international business fluctuations**.

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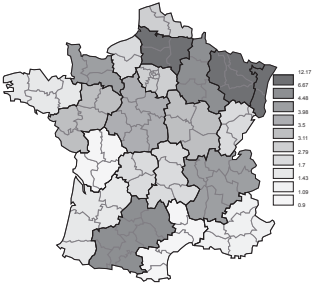
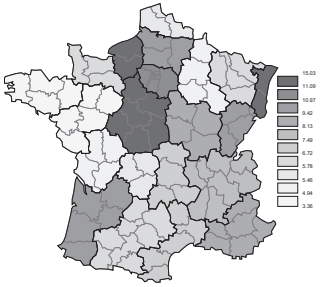
Our way to address this question

⇒ Relate BCC between 21 French regions and 162 countries to the presence of affiliates of foreign companies in French regions

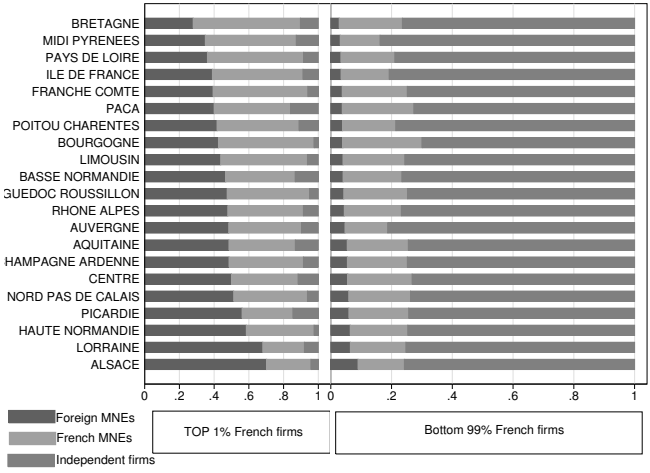


German affiliates



US affiliates

Few multinationals but big local footprint



Source: Kleinert, Martin, Toubal (2015)

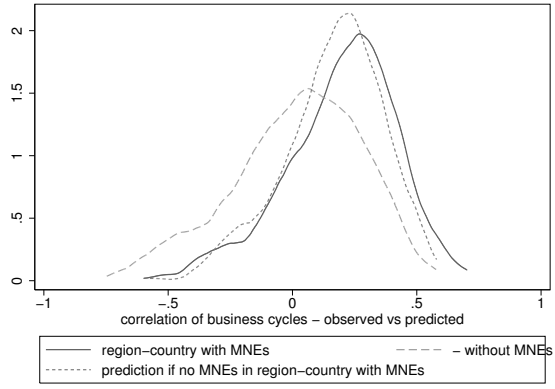
Main result: 10% ↗ in FME → 0.6% ↗ in BCC

Dep. variable: ρ_{cr}=*Correlation of growth rate of GDPs*	(1)	(2)	(3)	(4)
$FME_{cr}(Empl.)$	12.72***		11.01***	11.39***
	(4.053)		(3.431)	(3.509)
BT_{cr}		20.42***	15.36*	11.45
		(2.680)	(1.951)	(1.508)
IIT_{cr}				0.06
				(1.345)
$DISIM_{cr}$				-0.06***
				(-4.460)
Region FE	Yes	Yes	Yes	Yes
Country FE	Yes	Yes	Yes	Yes
Observations	3,402	3,402	3,402	3,329
R^2	0.691	0.690	0.691	0.695

Aparte: di Giovani, Levcheko, Mejean (AER, 2018)

- Use same data as Kleinert et al (2015) but provide an analysis of shocks' transmission at the firm-level.
- Their consider the correlation between the growth of firm's individual sales and the growth of GDP in foreign countries ($\rho\left(\gamma_{ft}, \gamma_{Ct}\right)$).
- They shhow firm sales are more correlated with the business cycle of countries...
  - ... they export to.
  - ... they import from.
  - ... where they have an affiliate in.
  - ... where their headquarter is located.
- $\Rightarrow$ International ties contribute to the transmission of shocks *at the firm-level*.

Back to KTM: Counterfactual distribution of GDP correlations



⇒ Muting multinational linkages strongly reduces business cycle comovement.

Kleinert, Martin, Toubal (2015): Take away

- Large firms have a large local footprint *and* international linkages.
- They are important vector of transmission of shocks across countries.
- The ownership of the (large) firms engaged in a country matter!

Table of Contents

1. Introduction

2. Exposure to and transmission of foreign shocks

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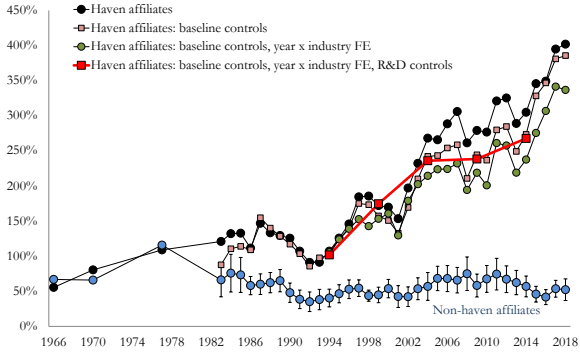
Context: increasing tax avoidance of multinational firms



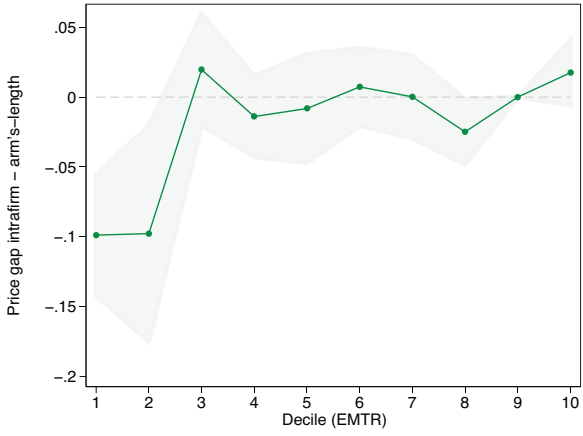
Source: Torslov, Wier, Zucman (REStud 2022).

Davies, Martin, Parenti, Toubal (REStat, 2018)

- Context: anecdotes, news articles but very few quantitative studies on profit shifting and transfer pricing (TP).
  - → TP: prices at which goods, services or intellectual property are transferred btw related parties of a multinational.
  - → used to minimize taxes by shifting profits to low-tax jurisdictions.
- Goal: detect aggressive use of transfer pricing practices and quantify its importance.
- Result: very few multinational firms exploit affiliates in tax havens to shift profits via transfer pricing **but** these are the largest firms.

Transfer pricing is about a few low-tax jurisdictions ...

Inaction band



⇒ MNEs manipulate transfer prices to low-tax countries only.

... and a few very large multinationals

	Dependent variables: Export price						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
$Intra_{fpmc} \times$:							
$(1-\tau_c)$	-0.08	-0.12	-0.17*	-0.05	0.05	-0.13*	-0.14*
	(-1.178)	(-0.993)	(-1.882)	(-0.664)	(0.453)	(-2.034)	(-1.979)
$TaxHaven_c$	-0.12***	-0.01	-0.10***	-0.11*	-0.07	-0.08***	-0.10***
	(-7.756)	(-0.228)	(-3.841)	(-2.002)	(-1.074)	(-3.295)	(-3.518)
Sample	Big MNEs	Small MNEs	French MNEs	Foreign MNEs	Homog. goods	Diff. goods	w/o negoce
	Firm-Prod.-Mode FE						
Country FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	723,921	697,897	567,071	465,008	11,980	608,535	553,745
Adj. R^2	0.868	0.869	0.876	0.871	0.847	0.885	0.868

$\Rightarrow$ Only the largest MNEs adopt TP strategies.

Few firms, few tax havens, sizable amounts

Country	Sh. French exports	Sh. exports intra-firm	Value not reported (million euros)
Switzerland	0.0407	0.58	590.0
Ireland	0.0083	0.62	129.0
Singapore	0.0072	0.58	105.0
Hong Kong	0.0071	0.54	96.3
Luxembourg	0.0056	0.37	51.3
Malta	0.0019	0.88	42.3
Cyprus	0.0007	0.53	9.9
Bermuda	0.0003	0.85	5.9
Bahamas	0.0002	0.51	2.8
Cayman Islands	0.0001	0.55	0.7

- Loss for French tax authorities: about 0.318×1 billion euros.
- Corporate tax receipts: 36 billions euros - Manuf only: about 10 billion euros.
- Just the tip of the iceberg (manuf + TP only).
- Made up by 450 firms; 50 firms make 50% of this trade.

Martin, Parenti, Toubal (2023)

$\Longrightarrow$ Standard perspective: corporate tax avoidance (CTA) reduces government revenues.

$\Longrightarrow$ This paper: CTA gives firms a built-in competitive advantage, distorts sales, and induces concentration.

→ *We have to continue to use all tools at our disposal to ensure companies pay their fair share of tax $(\cdots)$ this harms fair competition in the European Union.*
Margrethe Vestager, Sept. 2020.

→ *There are high profit, high wealth corporations that are paying very little in taxes. Change must happen at the international level to avoid unfair competition.*
Gita Gopinath, IMF - WB - OECD conference sept. 2020.

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Proceed in steps...

1. Does corporate tax avoidance influence sales?
   - ⇒ General framework: CTA offers a competitive edge to avoiding firms.
   - ⇒ Challenge: measuring CTA (see the paper).
   - ⇒ IV – and DiD strategies: causal impact of CTA on sales.

2. Has CTA contributed to industry concentration?
   - ⇒ Tax avoidance increases more for the largest firms, reinforcing concentration in many industries.
   - ⇒ In key industries, differences in CTA behaviors explains part of the rise of top firms market shares over the last 25 years.
   - ⇒ Relevant to explain increasing concentration in wholesale, retail, or computer and electronic products.
   - ⇒ Bottom line: fiscal and competition policy are intertwined.

Baseline: Sales and tax avoidance

Dep. Variable	Log Sales - End of Period					
	OLS		2SLS			
			1^{st} Stage	2^{nd} Stage	1^{st} Stage	2^{nd} Stage
HS tax gap	-2.648***	-1.038***		-5.408***		-4.085***
	(0.125)	(0.118)		(0.541)		(1.439)
Share of Intangible	1.167***	1.144***	-0.029***	1.041***	-0.071***	0.910***
	(0.082)	(0.076)	(0.011)	(0.090)	(0.019)	(0.151)
Labor Prod.	0.524***	0.484***	-0.054***	0.368***	-0.046***	0.345***
	(0.017)	(0.032)	(0.003)	(0.032)	(0.005)	(0.073)
Acquisition	1.243***	0.253***	-0.038***	1.130***	-0.006*	0.236***
	(0.029)	(0.017)	(0.004)	(0.035)	(0.003)	(0.020)
MNE Status	1.478***	0.317***	-0.071***	1.279***	-0.015***	0.274***
	(0.028)	(0.025)	(0.004)	(0.044)	(0.004)	(0.032)
Audit Prob. (Adj.)			0.011***		0.002***	
			(0.001)		(0.001)	
Sector × Period FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm FE	No	Yes	No	No	Yes	Yes
Obs.	22,271	18,546	22,271	22,271	18,546	18,546
Adj. R^2	0.527	0.930	0.140		0.610	
KP F-stat.				120.1		9.375

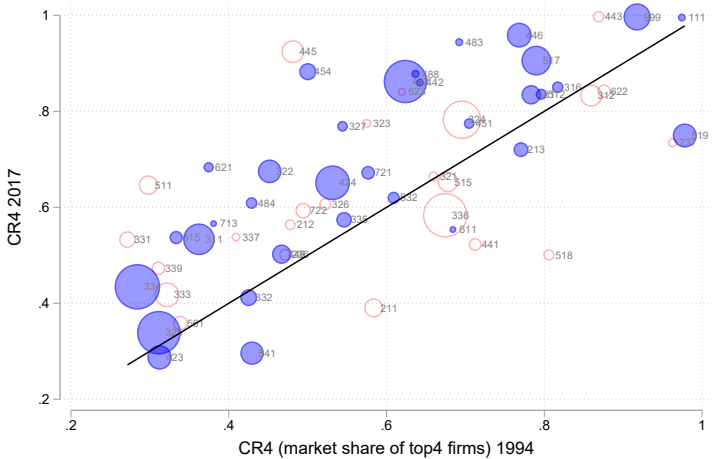
Sample years: 1994-2017. The dependent variable is the firm's log sales at the end of the four-year window. OLS and 2SLS estimates with robust standard errors in parentheses. First-stage Kleibergen-Paap Wald F statistic reported. ***, **, and * significantly different from 0 at the 1%, 5%, and 10% confidence levels, respectively.

Causal impact of CTA on sales - robust to:

- alternative measures of CTA,
- alternative IV strategy,
- alternative sample periods,
- controling for R&D,
- controling for lobbying,
- ....

Tax avoidance and industry concentration

CR4 have increased in most industries



In blue: tax avoidance of large vs small firms has increased.

What would have been the change in industry concentration in 1994 if firms had resorted to their CTA strategy of 2017?

NAICS code		weight	CR4 (1994)	$\Delta_{94,07}CR4$ obs.	$\Delta_{94,07}CR4$ pred.
488	**Support Activities for Transportation**	0.1%	74.5%	16.93%	9.56%
454	**Nonstore Retailers**	1.9%	49.8%	40.13%	**4.14%**
721	Accommodation	0.7%	62.9%	3.83%	3.31%
621	Ambulatory Health Care Services	0.5%	34.5%	32.38%	2.86%
517	Telecommunications	3.2%	77.6%	12.10%	2.33%
334	**Computer and Electronic Products**	8.3%	26.7%	15.49%	**2.27%**
484	Truck Transportation	0.5%	48.2%	9.82%	1.68%
322	Paper Manufacturing	1.1%	46.8%	18.90%	1.53%
337	Furniture and Related Products	0.2%	41.8%	11.35%	1.48%
212	Mining (except Oil and Gas)	0.6%	46.4%	7.86%	1.43%
316	Leather and Allied Product Manufacturing	0.5%	77.0%	9.32%	1.33%
446	Health and Personal Care Stores	3.7%	69.7%	25.74%	1.13%
512	Motion Picture and Sound Recording	0.4%	78.8%	5.23%	1.11%
...	...				

Table of Contents

1. Introduction

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Conclusion

- Large firms combine a sizable local footprint and international linkages.
- Their individual decisions and their economic health have aggregate implications.
- Examining their international ties allows us to better understand countries' exposure/vulnerability to foreign shocks.
- Investigating their decision is also key to apprehend public finance issues like tax avoidance and their implications.

Neighborhood impact of v. large firms

- Location choice of Amazon HQ2 raised significant media attention (for and against) with arguments about the impact for surrounding neighborhoods.
- In Montreal, arrival of Ubisoft (video game) fueled the renewal of the Mile-End neighborhood $\rightarrow$ gentrification.
- On-going project (with Behrens, Mayneris, Seror, Toubal): how does the arrival of large firms in (non-central) neighborhoods of NYC, L.A., and Chicago affect business dynamism at the local level?

Global firms and the environment

- Large firms: huge economic **and** *environmental* footprint.
- International network can be used to avoid local regulation (same as tax avoidance) $\rightarrow$ environmental leakages.
- Examination of the impact of environmental regulation like carbon border adjustment should account for these features.
- More generally, the role of large firms in shaping global harmful emissions is worth exploring!