The indirect effect of import competition on corporate tax avoidance

Baptiste Souillard[1]

[1] *ECARES, SBS-EM, Université Libre de Bruxelles*

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Motivation


THE 'IMMORAL' TAX AVOIDERS

Amazon, Starbucks and Google lashed by MPs over elaborate schemes that deprive Britain of millions

UK failed to challenge Google over tax loophole

'No British base' claim was never questioned

Brussels' €13bn tax bill clears way for further crackdowns on Apple

Dublin ordered to claw back cash • Vestager urges other authorities to examine figures

Web giant pays £4,327 tax – less than average UK worker

FACEBOOK INSULT TO TAXPAYERS

Ireland, Luxembourg and Holland face scrutiny • Starbucks and Apple in the spotlight

EU probes corporate tax sweeteners

- Profits are subject to **taxation**
- To lighten this **burden**, firms adapt how they organize, operate, and invest
- Some **avoid taxes**, i.e., exploit technicalities of the law to save taxes
- Corporate tax avoidance has now become a **major policy concern**
  - Tax scandals, budget deficits, rise in income inequalities, pandemic, etc
  - Profit shifting $\approx$ \$100b annual loss in tax revenues for the US (Clausing, 2016)

What I do in this paper

- The role played by **competition** is an unresolved question in the literature (Marrelli and Martina, 1988; Goerke and Runkel, 2011)

- To provide answers, I build on **2 distinct strands of research**
  - **Economics**: impact of the China shock → massive shock + quasi-natural experiment (e.g., Autor et al., 2013; Bloom et al., 2016; Pierce and Schott, 2016; Hombert and Matray, 2018)
  - **Accounting**: measurement of corporate tax avoidance (e.g., Frank et al., 2009; Hanlon and Heitzman, 2010; Henry and Sansing, 2018; Badertscher et al., 2019; De Simone et al., 2019)

- I study the effect of **Chinese import competition** on tax avoidance of US-headquartered public manufacturing firms using data on their **financial statements**

Preview of the results

- The paper documents a **positive** and **causal** effect of import competition on corporate tax avoidance
- This effect is specific to **multinational enterprises** (MNEs) and passes through intangible assets:

$$\uparrow \text{import competition} \Rightarrow \uparrow \text{intangible assets} \Rightarrow \uparrow \text{profit shifting}$$

- This effect is **a side one**: it seems that MNEs invested in intangibles to escape competition in the first place
- The findings carry **policy implications**:
  - they shed light on the determinants of corporate tax avoidance
  - they suggest that the China shock contributed 17 percent to the decline in the average effective tax rate of US-listed firms observed between 1990 and 2005 (Dyreng et al., 2017)
  - they help understand the recent backlash against large firms and globalization (Helpman, 2017; Ravallion, 2018; Rodrik, 2018)

Related literature

This paper lies at the intersection of 2 strands of research:

- Literature on **corporate tax avoidance**
  - Growing evidence of profit shifting activities (Beer et al., 2020)
    - Channels: e.g., Egger et al. (2010), Griffith et al. (2014), Alstadsaeter et al. (2018), Davies et al. (2018), Laffitte and Toubal (2019)
    - Macro estimates: e.g., Crivelli et al. (2016), Clausing (2016), Cobham and Jansky (2018), Tørsløv et al. (2018), Laffitte et al. (2020)
  - Determinants of tax dodging (Alm et al., 2019; Wang et al., 2020)
    - Internal drivers: e.g., Desai and Dharmapala (2009), McGuire et al. (2014), Higgins et al. (2015), Khan et al. (2017), Souillard (2020)
    - External factors: e.g., Marrelli and Martina (1988), Goerke and Runkel (2011), Hoopes et al. (2012), Dyreng et al. (2016), Edwards et al. (2016), Tian et al. (2016), Cen et al. (2017)
- Literature on the **China shock**
  - Labor markets: e.g., Autor et al. (2013), Mion and Zhu (2013), Utar and Ruiz (2013), Utar (2014), Acemoglu et al. (2016), Pierce and Schott (2016)
  - Firm behavior: e.g., Iacovone et al. (2013), Bloom et al. (2016), Hombert and Matray (2018), Chakraborty and Henry (2019), Amiti et al. (2020)

Outline of the talk

Outline of the talk

Sources and key variables

Firm-level data and tax avoidance variables

The **firm-level** data come from Compustat

- Compustat consists of **balance sheets**, **income statements**, and **cash flows** of **publicly listed firms** in North America since 1950
- I construct **4 firm-year specific indicators of corporate tax avoidance**:
  - ratio of income taxes to pre-tax income (ETR)
  - ratio of non-deferred income taxes to pre-tax income (ETR2)
  - ratio of cash income taxes paid to pre-tax income (CASHETR)
  - ratio of cash income taxes paid to operating cash flows (CFM)
- These variables are **complementary** and the **most prevalent** metrics in the accounting literature ▸ Table

Sources and key variables

Industry-level data and import competition variable

I supplement Compustat data with **industry-level data** at the **4-digit SIC** level from the NBER-CES Manufacturing Industry Database and Schott (2008)

- NBER-CES: annual output, employment, etc from 1958 to 2011
- Schott (2008): annual bilateral US exports and imports from 1972 to 2005
- The import competition variable is the **penetration ratio of US imports from China**:

$$IMP_{ijt} = IMP_{jt} = \frac{Imports_{jt}^{China,US}}{Output_{jt}^{US} + Imports_{jt}^{World,US} - Exports_{jt}^{US,World}}$$

  Firm i mostly active in sector j in year t

- This ratio varies both **over time** and **across sectors** ▸ Example

Sample

Focus on US-listed manufacturing firms between 1990 and 2005

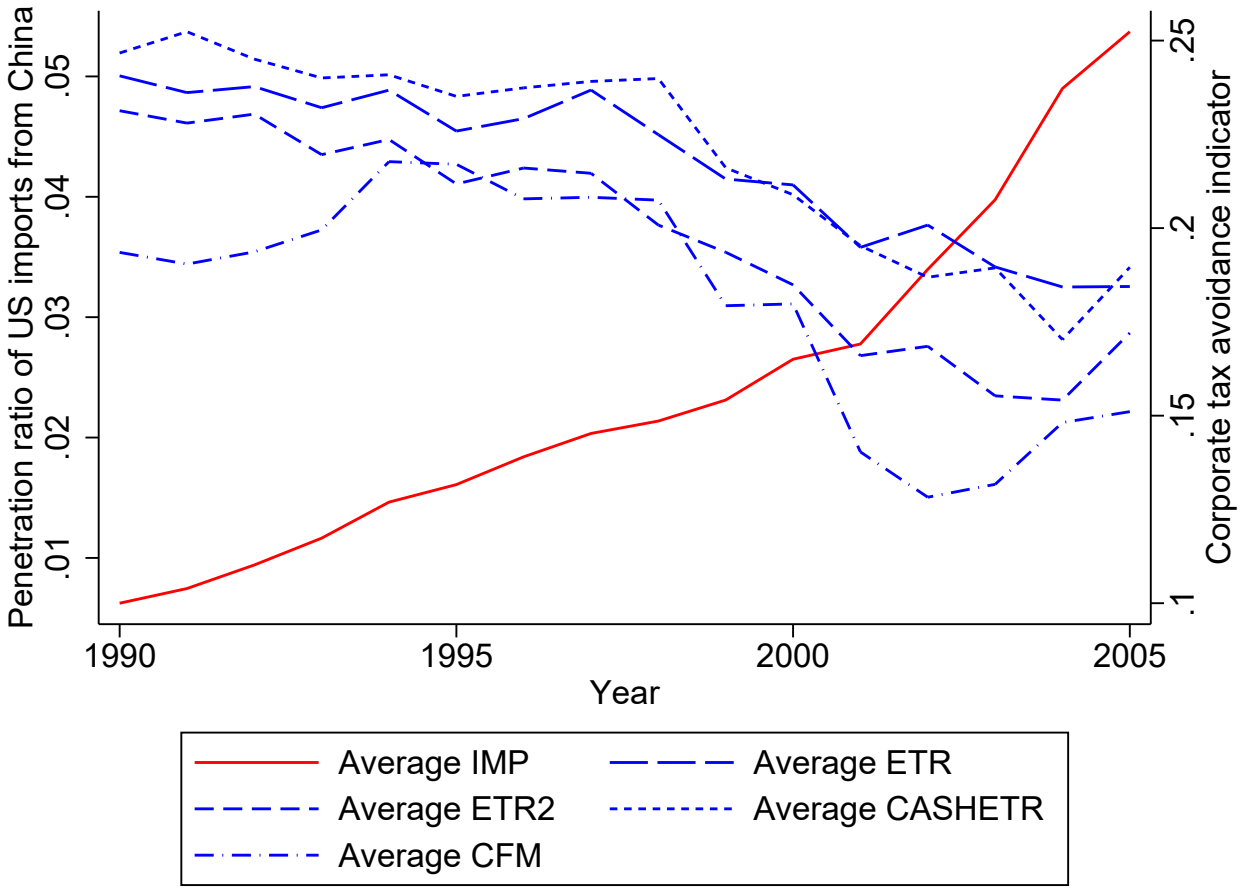
I use a subsample containing only **US-headquartered** firms operating **between 1990 and 2005** in **manufacturing**

- Headquartered in the US for comparability
- 1990s: start of the boom of China's exports ▸ Graph
- 90 percent of China's exports were manufacturing products

The unbalanced sample includes **5,739 firms** operating in **218 industries**

First evidence on import competition and corporate tax avoidance

Figure 1 – Import competition and corporate tax avoidance: macro-level evidence ▸ Table



- The positive correlation also holds at the industry-level ▸ Graph ▸ Table

Outline of the talk

Econometric model

Benchmark specification

I assess the effect of import competition on corporate tax avoidance by regressing:

$$CTA_{ijt} = \beta_0 + \beta_1 IMP_{jt} + \beta_2 X_{ijt} + \alpha_i + \delta_t + \epsilon_{ijt}$$

- *CTA*: corporate tax avoidance variable
- *IMP*: penetration ratio of US imports from China
- *X*: vector of control variables (e.g., sales, pre-tax income, tax loss carry forward, assets, profitability, leverage, foreign operations)
- α: firm-level fixed effects
- δ: year-level fixed effects

Baseline results

A positive effect of competition on corporate tax avoidance

Table 1 – Effect of import competition on corporate tax avoidance: baseline equation

	(1) ETR_{ijt}	(2) $ETR2_{ijt}$	(3) $CASHETR_{ijt}$	(4) CFM_{ijt}
IMP_{jt}	-0.20^{a}	-0.18^{b}	-0.18^{a}	-0.26^{a}
	(0.03)	(0.07)	(0.04)	(0.06)
Controls	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
R^2	0.20	0.21	0.13	0.12
Nb. of obs.	23,097	22,286	16,688	16,584

Notes. Standard errors, in parentheses, are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

▸ Counterfactual exercise

Sensitivity tests

Exclusion of outliers, more controls, model specification, and falsification tests

The effect is

- robust to removing different types of **outliers**: extreme values of the right-hand side variables, firms with negative profits, entries and exits, firms involved in a merger/acquisition operation
- robust to extending the set of **covariates**: more globalization-related variables, finer sets of fixed effects
- consistent across **specifications**: 3-digit industry level, 4-year averages, 16-year differences
- corroborated by **falsification tests**: random industry, pre-period data

▸ Table

Endogeneity issues

Lagged independent variables, IV strategy, and diff-in-diff approach

- **Reverse causality** + **"bad controls"** (Angrist and Pischke, 2009)
  $\Rightarrow$ lagged right-hand side variables ▸ Table
- Isolate **supply-side** driven shocks of import competition
  - Share of imports from China in 8 other high-income countries (Autor et al, 2013; Iacovone et al., 2013; Chakraborty and Henry, 2019) ▸ Table
  - Identification relies on 3 (too strong?) assumptions
- Alternative: exploit the **granting of the PNTR** status by the US to China in 2000
  - Responsible for 1/3 of the growth of US expenditures in Chinese goods (Handley and Limao, 2017)
  - Treatment: difference between the NNTR and NTR tariff rates
  - Most of the variation comes from NNTR tariff rates, established in 1930

$$CTA_{ijt} = \beta_0 + \beta_1 PNTR_{jt} + \beta_2 X_{ijt} + \alpha_i + \delta_t + \epsilon_{ijt}$$

with $PNTR_{jt} = 1_{t \geq 2001} \left(NNTR_{j1999} - NTR_{j1999} \right)$ ▸ Table ▸ Parallel trends + placebo

  - Robust to the correction proposed by de Chaisemartin and D'Haultfoeuille (2020)

Outline of the talk

What is behind this average effect?

Profit shifting of multinational firms via intangible assets

- **MNEs** can avoid taxes more easily than domestic firms: growing evidence in the literature that they **shift profits** towards low-tax countries
  - ⇒ Is the average effect driven by MNEs?
  - ⇒ Yes! ▸ Table
  - ⇒ Robust to the definition of an MNE (Exhibit 21 SEC files)

- There are 3 main tools to shift profits: **royalty payments**, loans, and transfer prices
- Only the first channel can be identified in Compustat and the strategic location of intangibles is one of the dominant profit shifting channels (Heckemeyer and Overesch, 2017)
  - ⇒ Indirect effect of competition through intangible assets?
  - ⇒ Yes! ▸ Table
  - ⇒ Robust to the definition of an intangible (extended definition or focus on patents)

⇒ **China shock → MNEs invested in intangibles → MNEs shifted more profits**

Did MNEs invest in intangibles to shift more profits?

No, they did it to escape competition in the first place

- If MNEs invested in intangibles principally to shift more profits and save taxes, we should note more **foreign direct investments of MNEs in tax havens** after the shock
  - ⇒ Did MNEs intensify their network of subsidiaries in tax havens?
  - ⇒ No! ▸ Table
- Alternatively, investments in intangibles could help firms upgrade and thus **escape competition**
  - ⇒ Is the negative impact of the China shock on sales mitigated by intangibles?
  - ⇒ Yes! ▸ Table

⇒ The increase in corporate tax avoidance is **a "side" effect** of import competition

Outline of the talk

Summary of the paper

- The effect of competition on corporate tax avoidance is theoretically unclear in the existing literature
- This paper attemps to fill this gap by investigating the effect of rising **Chinese import competition** on **tax avoidance of US publicly listed firms**
- The paper documents a **positive**, **causal**, and **statistically robust** effect of trade-induced competition on corporate tax avoidance
- The China shock prompted **MNEs** to invest in **intangibles** and these assets allowed them to **shift more profits** towards low-tax countries
- However, this effect is quite **indirect**: these intangibles primarily aimed at alleviating losses rather than saving taxes

Thank you for your attention!

Questions, comments, and suggestions are welcome:
baptiste.souillard@ulb.be

Full paper (with more robustness tests!):
www.baptistesouillard.com

Corporate tax avoidance variables

Table 2 – Correlation between tax avoidance variables (within firms)

	ETR	*ETR2*	*CASHETR*	*CFM*
ETR	1.00			
ETR2	0.53	1.00		
CASHETR	0.26	0.41	1.00	
CFM	0.20	0.27	0.64	1.00

Notes. This table reports the average Pearson's correlation coefficients between the four tax avoidance variables (within firms). For a firm-year observation to be included in the computation of a correlation coefficient, the two tax avoidance variables must lie in the [0,1] interval.

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Import penetration ratio across sectors

- The penetration ratio of Chinese exports to the US of **hardwood veneer and plywood products** (SIC 2435) was 12 percent in 2005, i.e., about twice the average
- For **softwood veneer and plywood products** (SIC 2436), the import penetration ratio was **40 times smaller** in the same year (0.3 percent)

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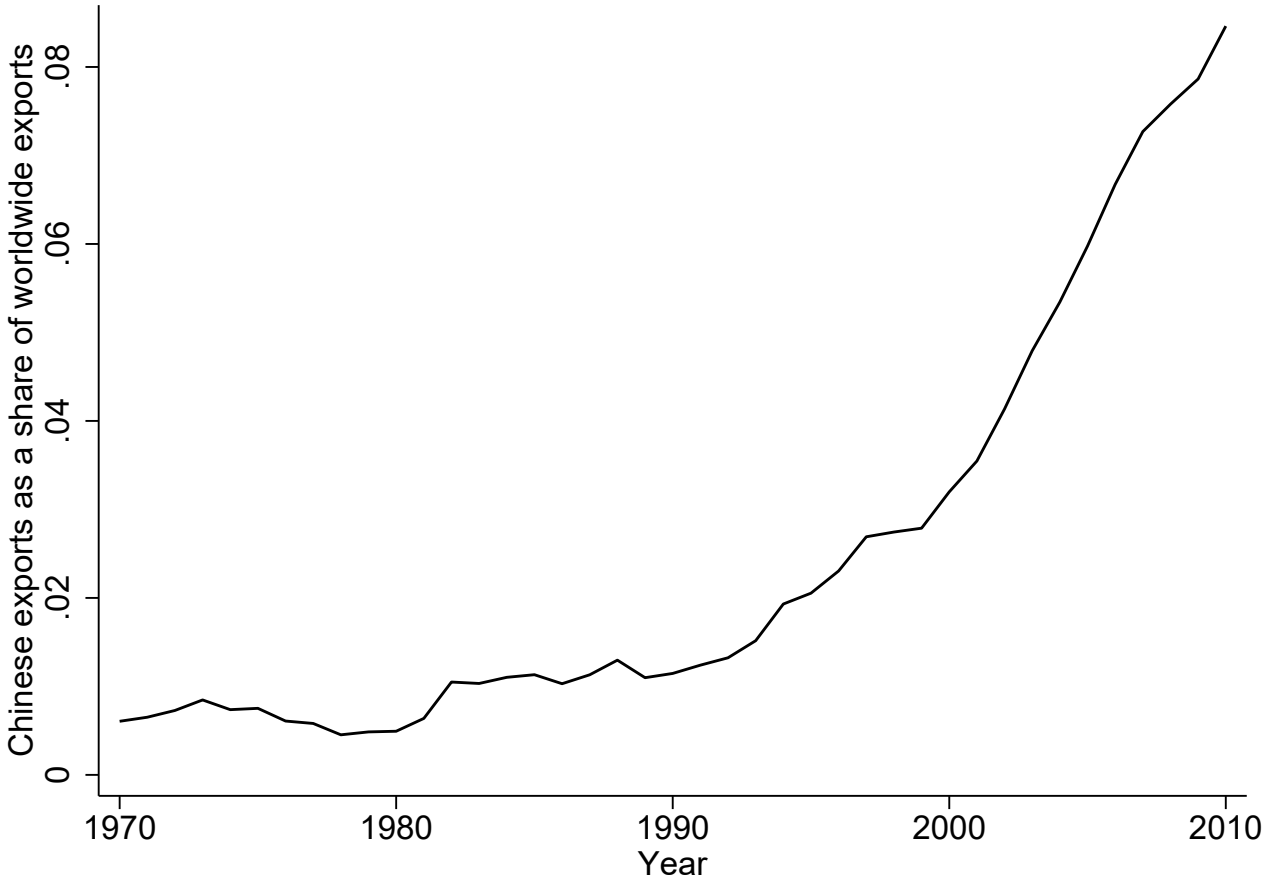
China's exports

Figure 2 – Exports from China between 1970 and 2010



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Correlation (1)

Table 3 – Import competition and corporate tax avoidance: macro-level regressions

	(1) $\overline{ETR_t}$	(2) $\overline{ETR2_t}$	(3) $\overline{CASHETR_t}$	(4) $\overline{CFM_t}$
$\overline{IMP_t}$	-1.36^a	-1.76^a	-1.73^a	-1.62^a
	(0.13)	(0.22)	(0.20)	(0.39)
Controls	No	No	No	No
Nb. of obs.	16	16	16	16

Notes. Standard errors are in parentheses. $^d p < 0.15$, $^c p < 0.10$, $^b p < 0.05$, $^a p < 0.01$.

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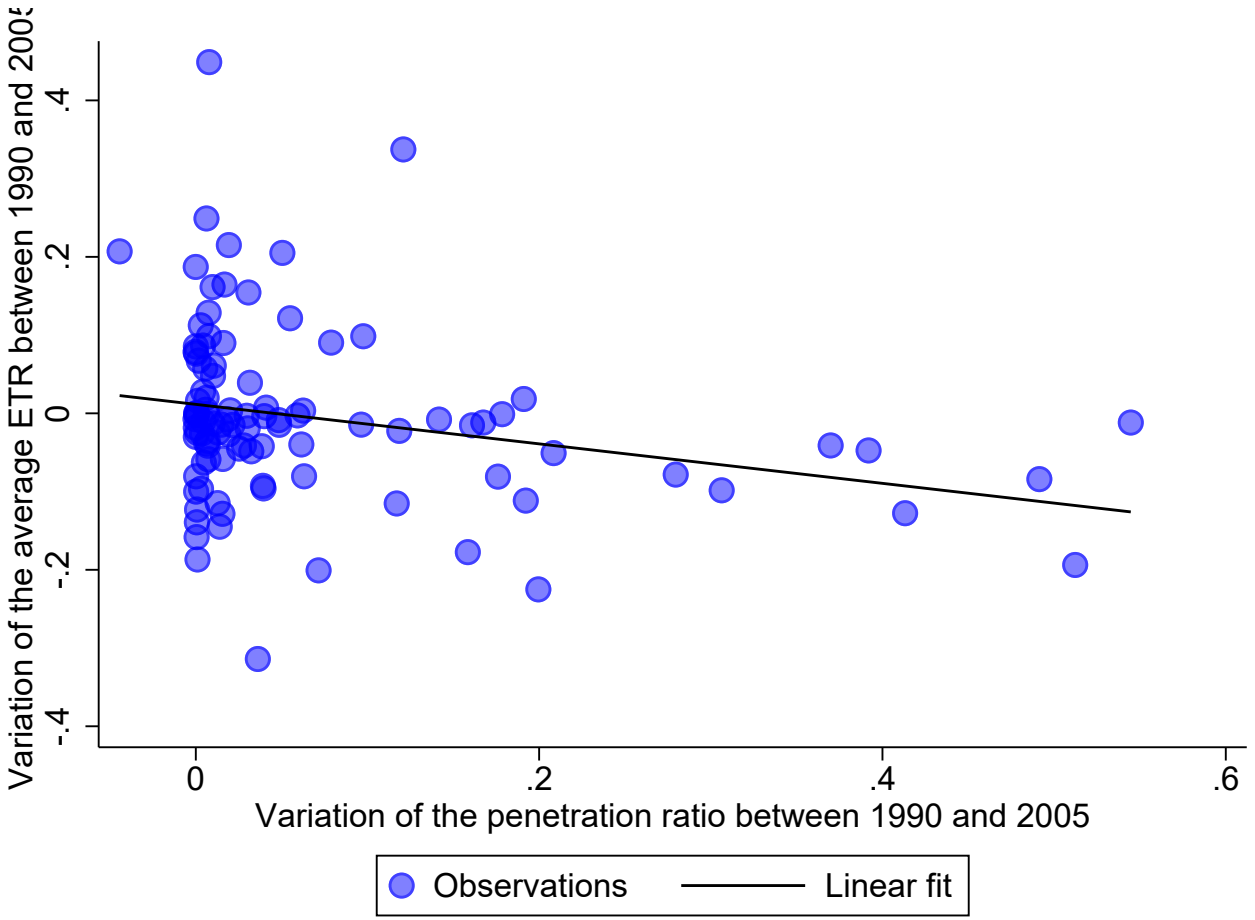
Correlation (2)

Figure 3 – Import competition and corporate tax avoidance: industry-level evidence



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Correlation (3)

Table 4 – Import competition and corporate tax avoidance: industry-level regressions

	(1) $\overline{ETR}_{jt}$	(2) $\overline{ETR2}_{jt}$	(3) $\overline{CASHETR}_{jt}$	(4) $\overline{CFM}_{jt}$
IMP_{jt}	-0.11^{d}	-0.11^{c}	-0.06	-0.12^{d}
	(0.07)	(0.06)	(0.06)	(0.08)
Year FEs	Yes	Yes	Yes	Yes
Industry FEs	Yes	Yes	Yes	Yes
Nb. of obs.	1,785	1,771	1,783	1,783

Notes. Standard errors, in parentheses, are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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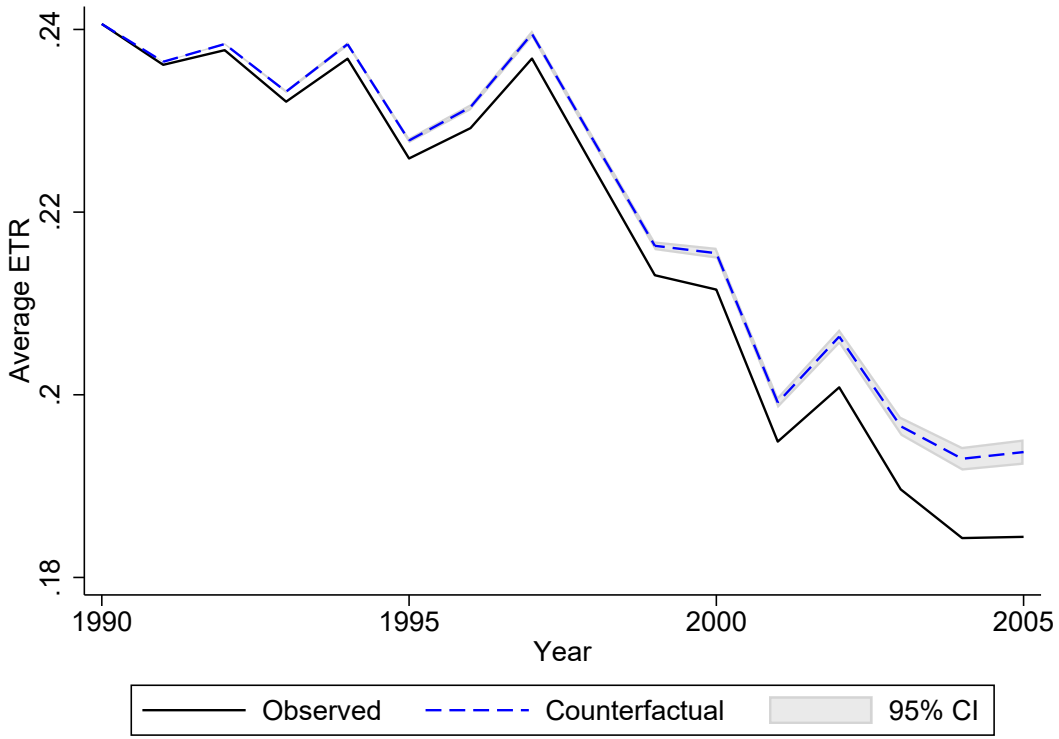
Baseline results

Figure 4 – Counterfactual analysis with back-of-the-envelope computations



- The average ETR would have been **0.93 percentage point** higher in 2005 if the penetration ratio of US imports from China had been constant → the China shock contributed **17 percent** to the decline in the average ETR observed between 1990 and 2005 ▸ Back

Robustness tests

Table 5 – Effect of import competition on corporate tax avoidance: robustness checks

	(1) *ETR*	(2) *ETR2*	(3) *CASHETR*	(4) *CFM*
Baseline estimates	-0.20^{a}	-0.18^{b}	-0.18^{a}	-0.26^{a}
Panel A: exclusion of outliers				
A1. Extreme values	-0.36^{a}	-0.30^{a}	-0.33^{a}	-0.43^{a}
A2. Negative profits	-0.15^{a}	-0.11^{c}	-0.17^{a}	-0.22^{a}
A3. Entries and exits	-0.22^{a}	-0.23^{a}	-0.17^{a}	-0.22^{a}
A4. Involved in M&A	-0.23^{a}	-0.19^{a}	-0.18^{a}	-0.27^{a}
Panel B: more controls				
B1. Trends in globalization	-0.17^{a}	-0.15^{b}	-0.19^{a}	-0.21^{a}
B2. Trends in globalization (USDIA included)	-0.20^{a}	-0.15^{c}	-0.18^{b}	-0.14^{b}
B3. State-year FEs	-0.20^{a}	-0.19^{a}	-0.16^{a}	-0.26^{a}
B4. State-year-MNE status FEs	-0.21^{a}	-0.18^{a}	-0.15^{a}	-0.27^{a}
Panel C: alternative specifications				
C1. SIC 3-digit industry	-0.15^{a}	-0.16^{a}	-0.10^{b}	-0.18^{a}
C2. 4-year periods	-0.30^{a}	-0.11	-0.17^{c}	-0.23^{a}
C3. 16-year differences	-0.18^{c}	-0.36^{a}	-0.16^{c}	-0.32^{b}
Panel D: falsification tests				
D1. Random industry	0.01	-0.02	-0.01	0.05
D2. Pre-period data	-0.11	-0.06	0.35	0.36

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Endogeneity issues (1)

Table 6 – Effect of import competition on corporate tax avoidance: endogeneity

	(1) *ETR*	(2) *ETR2*	(3) *CASHETR*	(4) *CFM*
Panel A: lagged controls				
A1. One-year lags	-0.21[a]	-0.16[b]	-0.19[a]	-0.30[a]
A2. Two-year lags	-0.21[a]	-0.14[d]	-0.19[a]	-0.27[a]
Panel B: 2SLS à la Autor et al. (2013)				
B1. First-stage results: IMP_{jt} on instrument				
Point estimate				
F-statistic				
B2. Second-stage results: CTA_{ijt} on $\widehat{IMP}_{jt}$				
Point estimate				
Panel C: PNTR as a quasi-natural experiment				
Controls	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes

Notes. Standard errors are clustered at the 4-digit 1987 SIC industry and not reported for space. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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Endogeneity issues (2)

Table 7 – Effect of import competition on corporate tax avoidance: endogeneity

	(1) *ETR*	(2) *ETR2*	(3) *CASHETR*	(4) *CFM*
Panel A: lagged controls				
A1. One-year lags	-0.21^{a}	-0.16^{b}	-0.19^{a}	-0.30^{a}
A2. Two-year lags	-0.21^{a}	-0.14^{d}	-0.19^{a}	-0.27^{a}
Panel B: 2SLS à la Autor et al. (2013)				
B1. First-stage results: IMP_{jt} on instrument				
Point estimate	0.63^{a}	0.63^{a}	0.62^{a}	0.63^{a}
F-statistic	32.65	33.16	29.12	30.23
B2. Second-stage results: CTA_{ijt} on $\widehat{IMP}_{jt}$				
Point estimate	-0.31^{a}	-0.28^{b}	-0.28^{a}	-0.37^{a}
Panel C: PNTR as a quasi-natural experiment				
Controls	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes

Notes. Standard errors are clustered at the 4-digit 1987 SIC industry and not reported for space. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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Endogeneity issues (3)

Table 8 – Effect of import competition on corporate tax avoidance: endogeneity

	(1) *ETR*	(2) *ETR2*	(3) *CASHETR*	(4) *CFM*
Panel A: lagged controls				
A1. One-year lags	-0.21^{a}	-0.16^{b}	-0.19^{a}	-0.30^{a}
A2. Two-year lags	-0.21^{a}	-0.14^{d}	-0.19^{a}	-0.27^{a}
Panel B: 2SLS à la Autor et al. (2013)				
B1. First-stage results: IMP_{jt} on instrument				
Point estimate	0.64^{a}	0.63^{a}	0.62^{a}	0.63^{a}
F-statistic	32.65	33.16	29.12	30.23
B2. Second-stage results: CTA_{ijt} on $\widehat{IMP}_{jt}$				
Point estimate	-0.30^{a}	-0.28^{b}	-0.28^{a}	-0.37^{a}
Panel C: PNTR as a quasi-natural experiment	-0.06^{b}	-0.08^{c}	-0.01	-0.07^{d}
Controls	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes

Notes. Standard errors are clustered at the 4-digit 1987 SIC industry and not reported for space. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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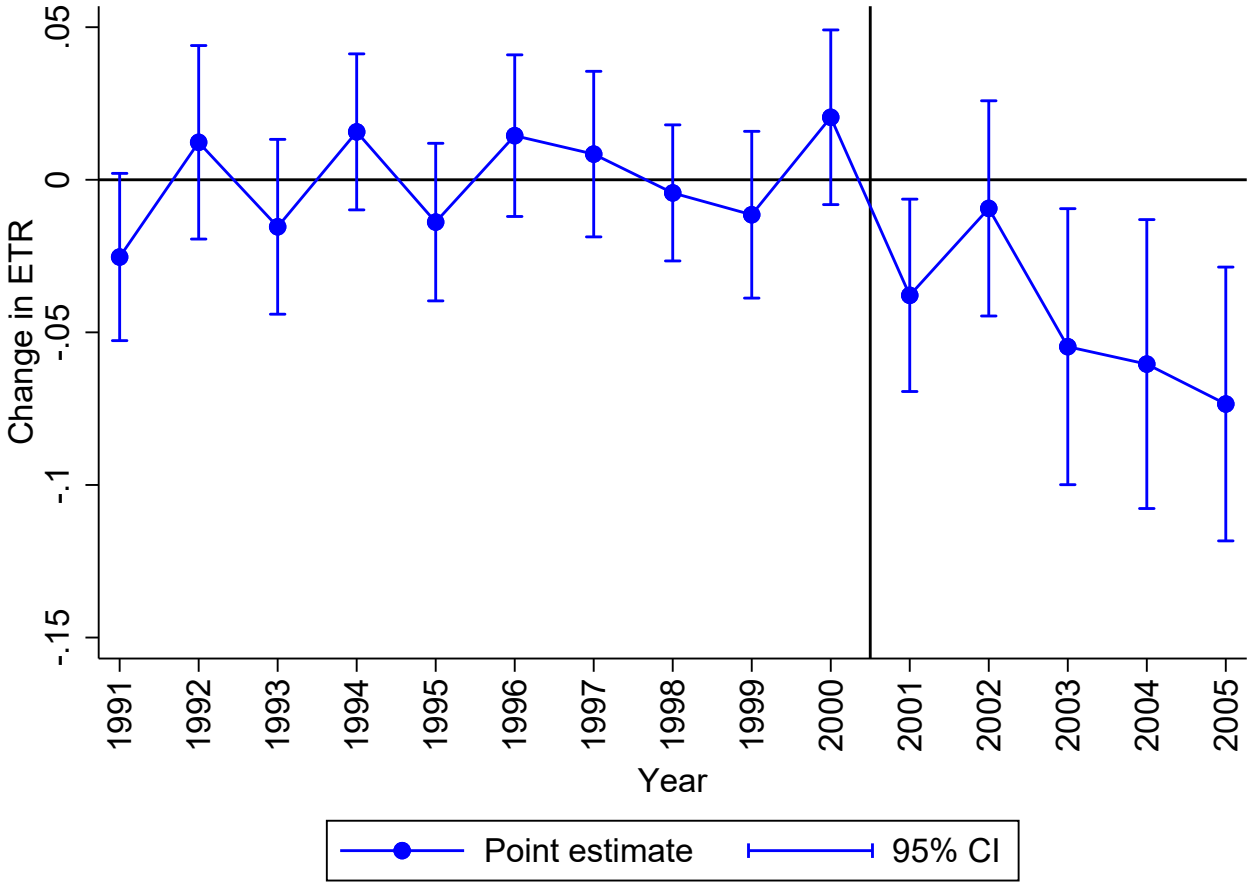
Endogeneity issues (4)

Figure 5 – Pre-trends in *ETR* and dynamics of the effect



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Mechanism (1)

Table 9 – Effect of import competition on corporate tax avoidance: mechanism

	(1) ETR_{ijt}	(2) ETR_{ijt}
$PNTR_{jt}$	-0.06^{b}	-0.02
	(0.03)	(0.03)
$PNTR_{jt} \times MNE_{ijt}$		-0.06^{a}
		(0.02)
Controls	Yes	Yes
Firm FEs	Yes	Yes
Year FEs	Yes	Yes

Notes. Standard errors are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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Mechanism (2)

Table 10 – Effect of import competition on corporate tax avoidance: mechanism

	(1) ETR_{ijt}	(2) ETR_{ijt}	(3) ETR_{ijt}	(4) ETR_{ijt}	(5) $intangibles_{ijt}$
$PNTR_{jt}$	-0.06^{b}	-0.02	-0.03	-0.03	0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
$PNTR_{jt} \times MNE_{ijt}$		-0.06^{a}			0.04^{c}
		(0.02)			(0.02)
$intangibles_{ijt}$			0.02	0.04^{a}	
			(0.01)	(0.02)	
$intangibles_{ijt} \times MNE_{ijt}$				-0.06^{b}	
				(0.03)	
Controls	Yes	Yes	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes

Notes. Standard errors are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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Mechanism (3)

Table 11 – Effect of import competition on corporate tax avoidance: a side one?

	(1) $TAXHAVEN^{ext}_{ijt}$	(2) $TAXHAVEN^{int}_{ijt}$
$PNTR_{jt}$	0.04	3.15
	(0.07)	(4.50)
$PNTR_{jt} \times intangibles_{ijt}$		
Controls	Yes	Yes
Firm FEs	Yes	Yes
Year FEs	Yes	Yes
Nb. of obs.	28,443	4,641

Notes. Standard errors, in parentheses, are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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Mechanism (4)

Table 12 – Effect of import competition on corporate tax avoidance: a side one?

	(1) $TAXHAVEN^{ext}_{ijt}$	(2) $TAXHAVEN^{int}_{ijt}$	(3) $sales_{ijt}$
$PNTR_{jt}$	0.04	3.15	-2,740.44^{b}
	(0.07)	(4.50)	(1,226.00)
$PNTR_{jt} \times intangibles_{ijt}$			1.44^{b}
			(0.70)
Controls	Yes	Yes	Yes
Firm FEs	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes
Nb. of obs.	28,443	4,641	30,141

Notes. Standard errors, in parentheses, are clustered at the 4-digit 1987 SIC industry. $^{d}p < 0.15$, $^{c}p < 0.10$, $^{b}p < 0.05$, $^{a}p < 0.01$.

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