

Econ 230B – Graduate Public Economics

The challenges of taxing capital in a globalized world

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Roadmap

Globalization raises three key challenges:

1. Profit shifting → can lead to large corp tax revenue loss
2. Tax competition → can lead government to adopt sub-optimally low corporate tax rates
3. No or imperfect information sharing → can prevent enforcement of residence-based personal capital taxes

1 Profit shifting

Reminder on source vs. residence based corporate taxes:

- Source (= *territorial*) taxation: profits taxed where prod. occurs
- Residence (= *worldwide*) taxation: profits taxed where owner lives
- Corporate taxes of most countries are source-based (with some residence elements, e.g., 10.5% GILTI minimum tax in US)
- Source-based taxation → incentives to shift profits to tax havens

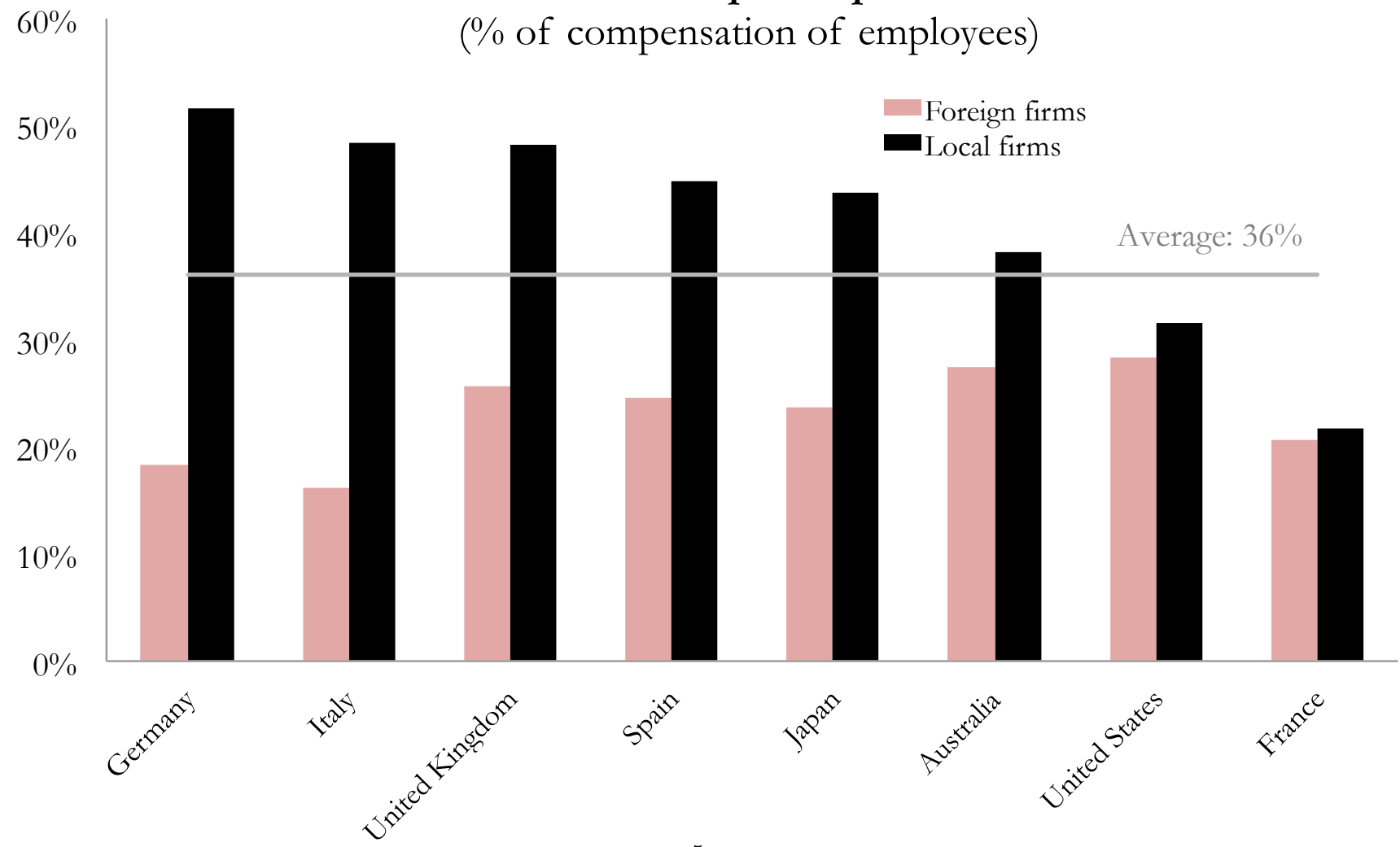
Macro evidence on profit shifting (Torslov et al., 2018)

Idea: study capital share of local vs. foreign firms across the world.

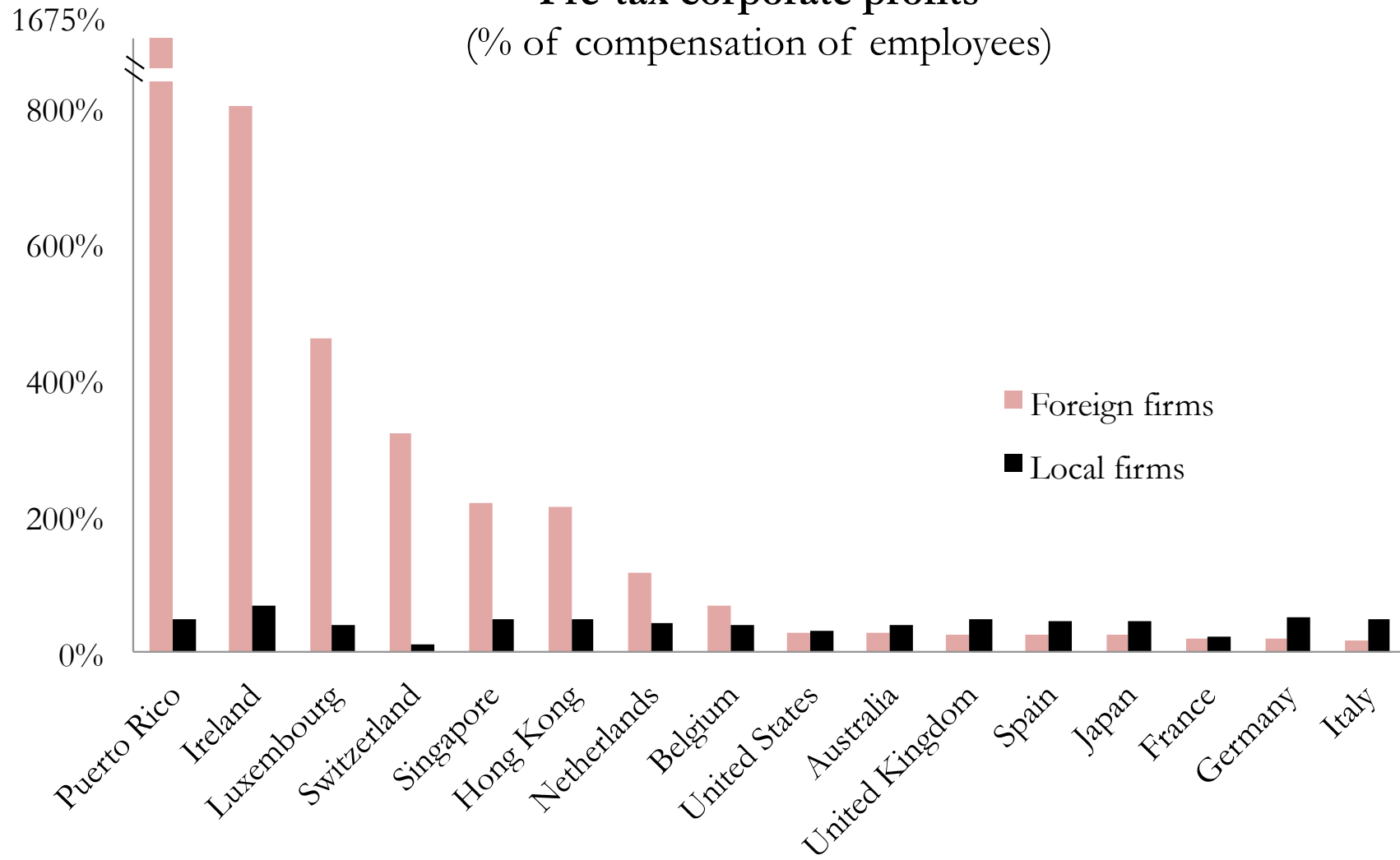
Striking global pattern:

- Foreign firms have lower α than local firms...
- ... Except in tax havens: hugely higher α
- Estimate of globally shifted profits: set profitability of foreign firms in havens equal to profitability of local firms in havens

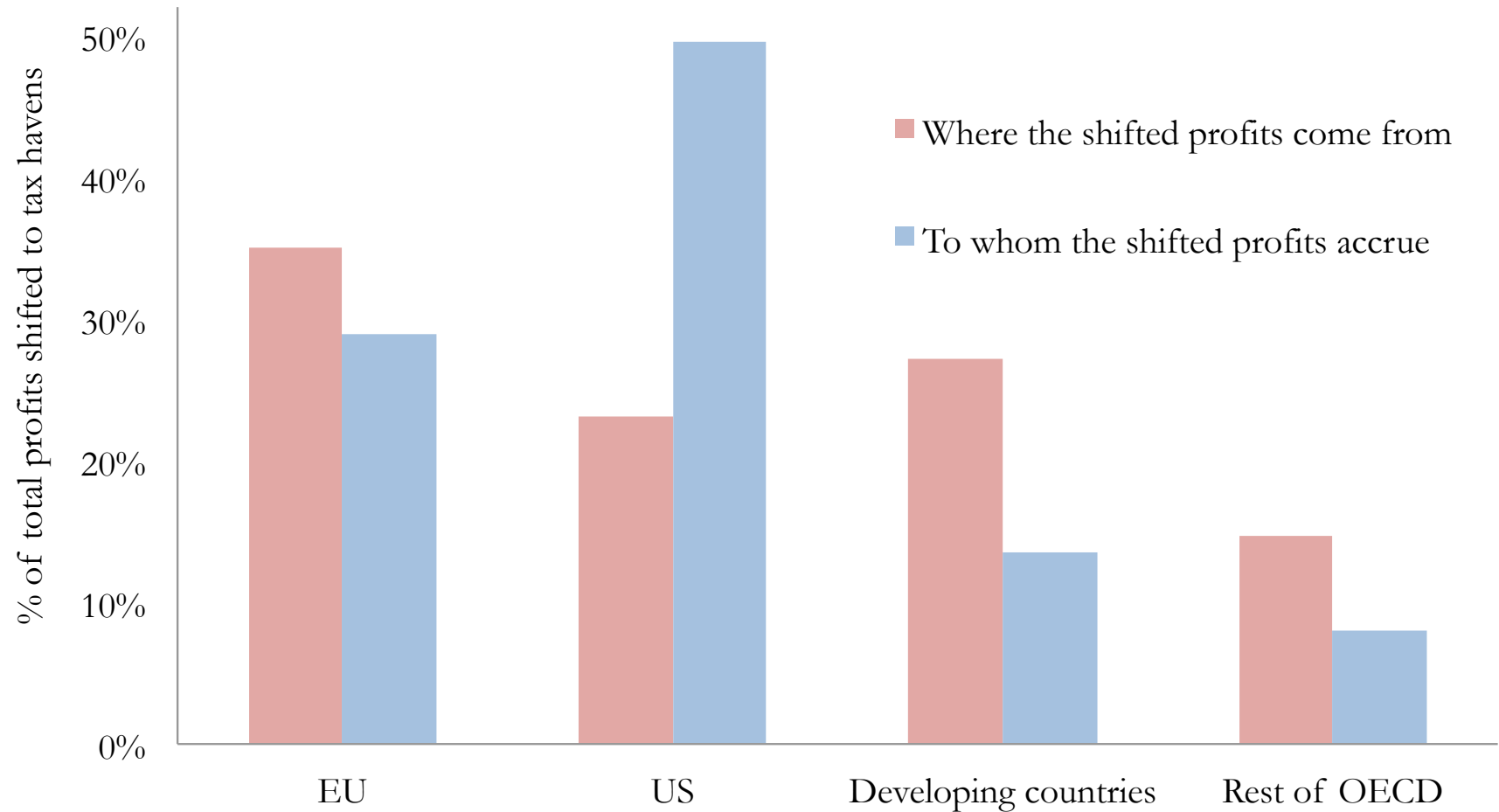
Pre-tax corporate profits
(% of compensation of employees)



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 (% of compensation of employees)



Allocating the profits shifted to tax havens



How profit-shifting works

Three ways to shift profits to low-tax countries:

- Manipulating intra-group import and export prices (*transfer prices*)
- Intra-group borrowing
- Locating intangibles in tax havens

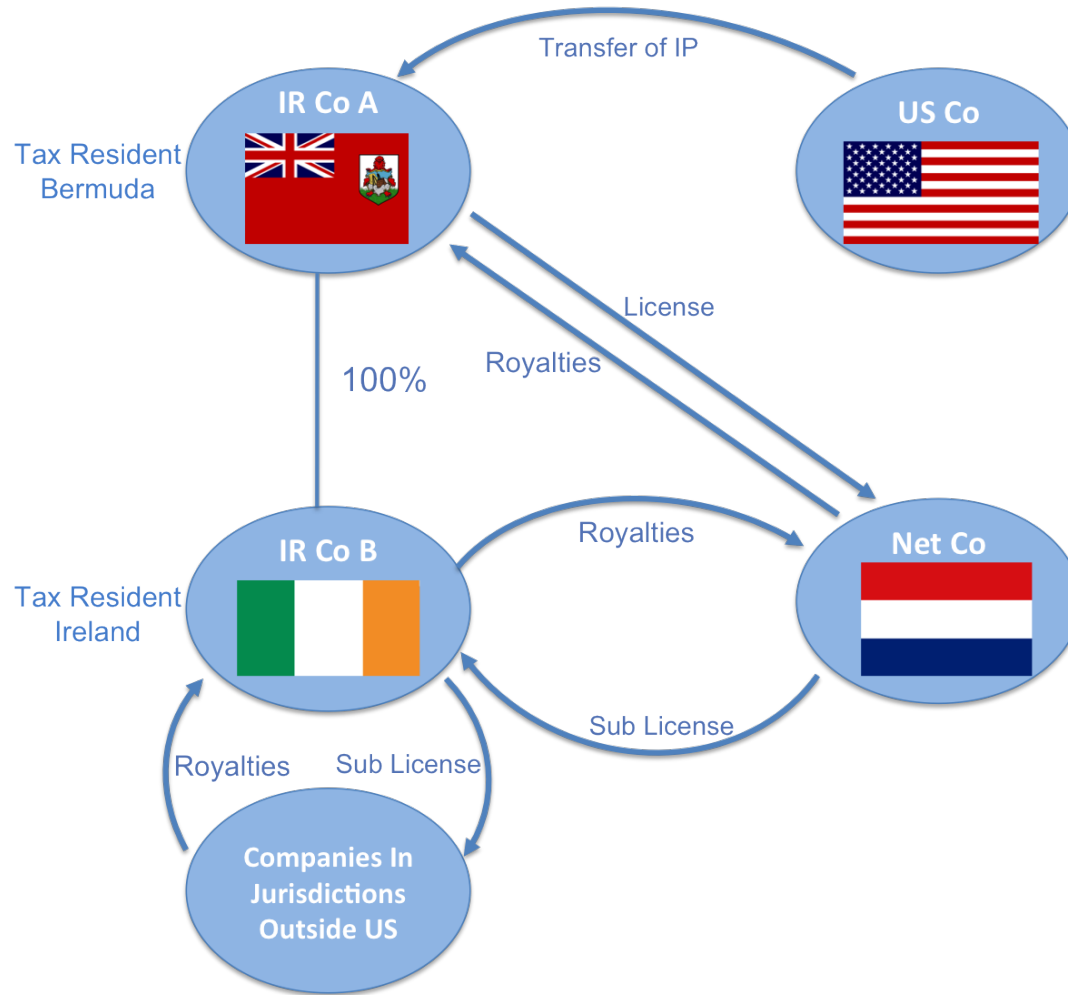
Heckemeyer & Overesch (2013): transfer price most important (but limited data on intangibles)

Transfer price manipulations

- Subsidiaries of a same group are supposed to compute their profits as if unrelated (*arm's length pricing*)
- In practice, relatively easy to manipulate transfer prices, and reference prices sometimes do not exist
- Sizable evidence that intra-group prices differs from arm's length prices (Clausing NTJ 2003)
- Intra-group price manipulation also a problem in purely domestic context (*tunneling*): Bertrand, Mehta and Mullainhathan (QJE'02)

Strategic location of debt and intangibles

- Booking assets in low-tax countries enables firms to deduct income in high-tax countries and earn interest & royalties in tax havens
- Problem is growing in importance with rise of intangible capital
- Anti-avoidance rules: thin capitalization, controlled foreign corporations
- Routinely avoided by exploiting inconsistency in tax laws across countries (*treaty shopping*)



The Double Irish Dutch Sandwich

Dharmapala and Riedel (JpubE 2013)

- Estimates extent of profit-shifting among sample of European multinationals (Amadeus)
- Strategy: measure reaction to a parent's earnings' shocks of the earnings of subsidiaries in other countries
- Earnings in low-tax countries respond more than earnings in high-tax jurisdictions → suggests shifting to low-tax countries
- Key channel of profit shifting: choice of borrowing location

Policies to prevent profit shifting

- Strengthening arm's length rules (OECD BEPS), monitoring transfer prices, increasing reporting requirements, hiring auditors...
- Theoretically, unclear whether this is useful: risk of wasteful expenditure of resources on both sides. Limited evidence on effectiveness.
- Formulary apportionment, DBCFT (see below)

2 Tax competition

How does tax policies in one country affect the options in other countries, and in turn their policies?

- Increasingly important question with globalization, increased factor mobility, more perfect international capital market
- See Lane and Milesi-Ferretti (2003, 2007) on rise of cross-border investment
- Similar issues between sub-national govts. (such as US states). Key difference: Federal gov. can help coordinate

Zodrow and Mieszkowski (1986) and Wilson (1986)

- n countries $i = 1, \dots, n$ with output per unit of labor $y_i = f_i(k_i)$
- Labor supplied inelastically by population h_i (immobile)
- Source taxes on capital at rate t_i , generating $t_i k_i$ in revenue
- Capital-owners can invest wherever they want \rightarrow after-tax return to capital has to be the same everywhere: $f'_i(k_i) - t_i = \rho \quad \forall i$
- Consumer has preferences over private good (x) & public good (r)
- Consumer welfare in i : $W_i = f_i(k_i) - f'_i(k_i)k_i + \rho \bar{k}_i + G_i(t_i k_i)$

- Government chooses tax rate to maximize welfare, taking tax rates of all other countries as given.
- Assume t_i increases. Then capital moves out of i to other countries until we're back to $f'_i(k_i) - t_i = \rho$ for all i
- So domestic capital falls in i , rises elsewhere and ρ falls
- FOC is:
$$\frac{\partial W_i}{\partial t_i} = -f''_i(k_i)k_i \frac{\partial k_i}{\partial t_i} + G'_i(t_i k_i) \left(k_i + t_i \frac{\partial k_i}{\partial t_i} \right) + \frac{\partial \rho}{\partial t_i} \bar{k}_i = 0$$
- Gov weighs the reduction in wage, increase in revenue, and reduced net income on wealth

Symmetric Nash equilibrium in pure strategies:

- FOC defines a best response function $t_i(t_{-i})$ relating gov maximizing tax rate to the tax rates t_{-i} set by all others
- The intersection of the best responses $t_i(t_{-i})$ characterizes an interior Nash equilibrium in pure strategies (when it exists)
- Is the equilibrium socially optimum?
- Consider how small increases in tax rate $dt_i = dt$ by all countries would affect welfare in country i at the Nash equilibrium

- This reduces ρ by dt and leaves total capital and its allocation unchanged, so $dW_i = [(k_i - \bar{k}_i) f_i''(k_i) - G_i'(t_i k_i) t_i] \frac{\partial k_i}{\partial t_i} dt$
- If countries are identical (same population, production function, same preferences) then in equilibrium $k_i = \bar{k}_i = \bar{k}$ and:

$$dW_i = -G_i'(t_i k_i) t_i \frac{\partial k_i}{\partial t_i} dt > 0$$

- All countries would benefit from a small uniform increase in all tax rates: the Nash equilibrium is not Pareto efficient

→ Core argument against international tax competition

Asymmetric equilibrium

- Country i gains from dt iff $(k_i - \bar{k}_i)f_i'' - G_i'(t_i k_i)t_i < 0$.
- This is always the case when $k_i > \bar{k}_i \rightarrow$ for capital importers, it's always good to have a coordinated increase in corporate taxes
- For capital exporters, it's unclear
- Depends, e.g., on how far they are from optimal provision of public goods
- See Keen and Konrad (HPE, 2013)

Empirical evidence on capital mobility

- A number of studies regress FDI on taxes, find elasticities close to or above 1 (see Zodrow 2010 for survey)
- Identification relies on orthogonality of tax rates to other factors (e.g., bureaucracy). No natural quasi-experimental variation
- Main response to differentials in τ_K seems to be artificial profit shifting rather than changes in K
- If policies successful at curbing profit shifting, mobility could \nearrow , pushing τ_K further toward 0 (Hong & Smart '10; Johannesen '10)

Capital mobility vs. profit shifting: the case of US multinationals (Wright-Zucman 2018)

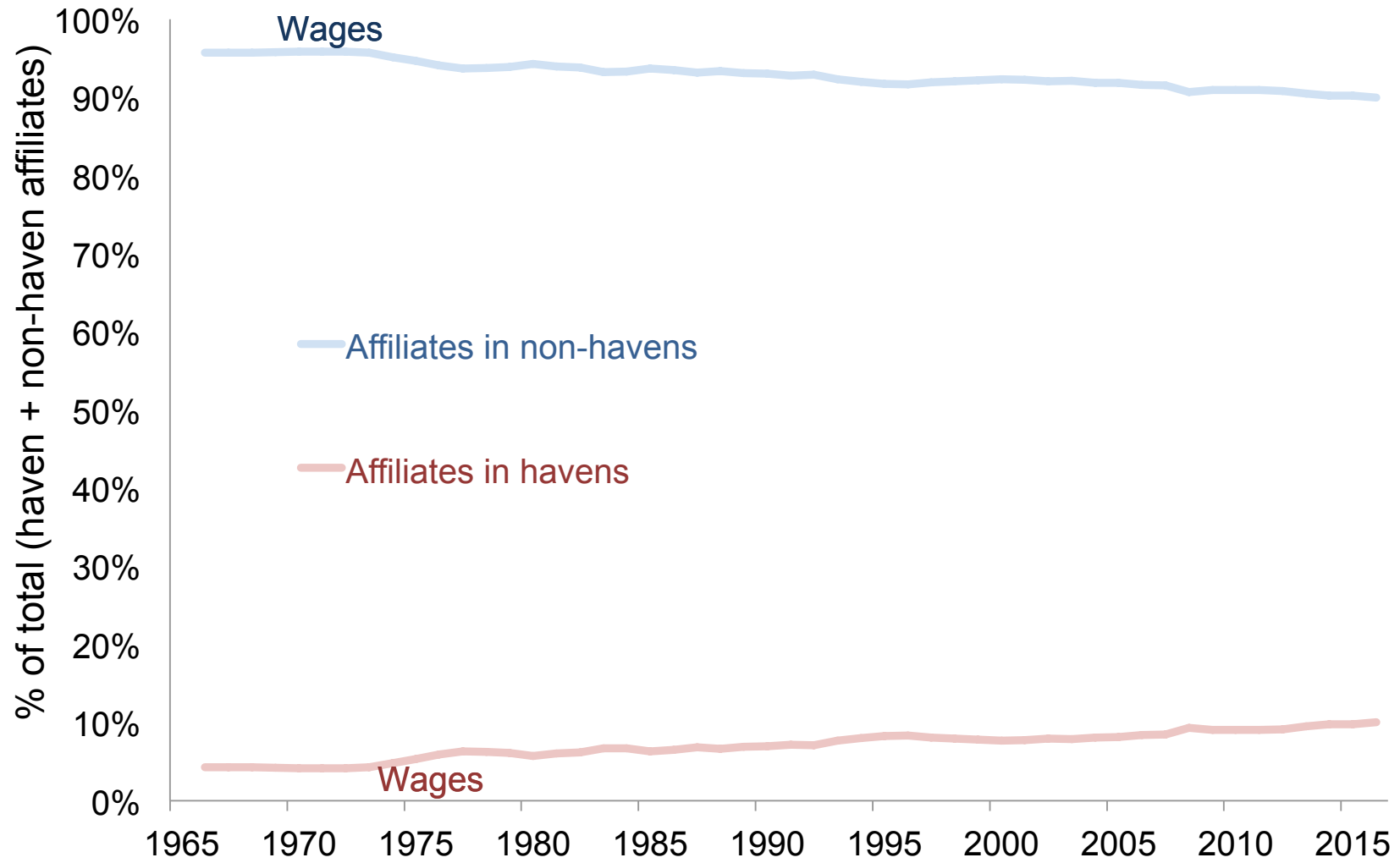
Study profits, wage, capital, rates of returns, and taxes of US multinationals back to 1966

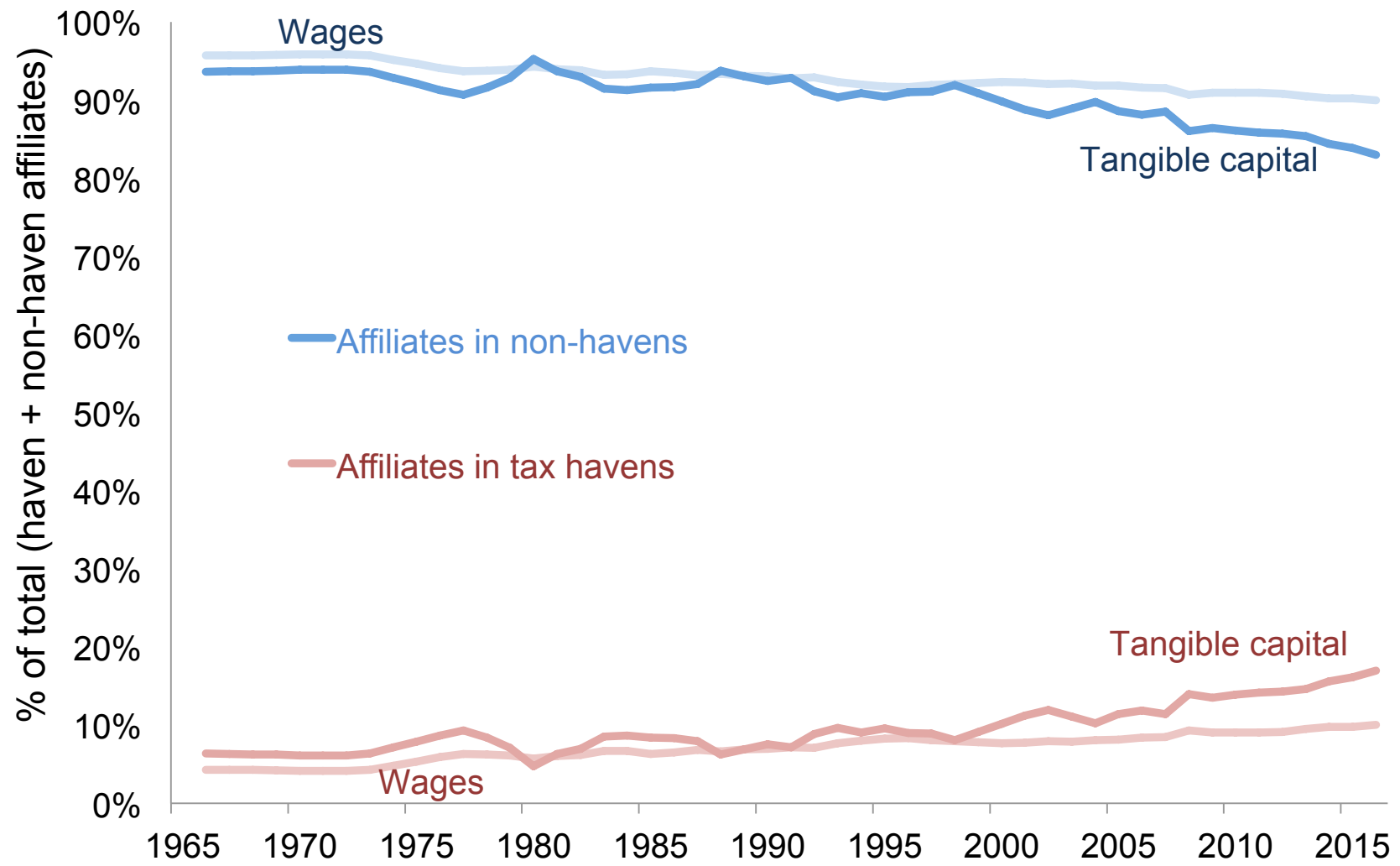
Key source: BEA survey of activities of US multinat'l

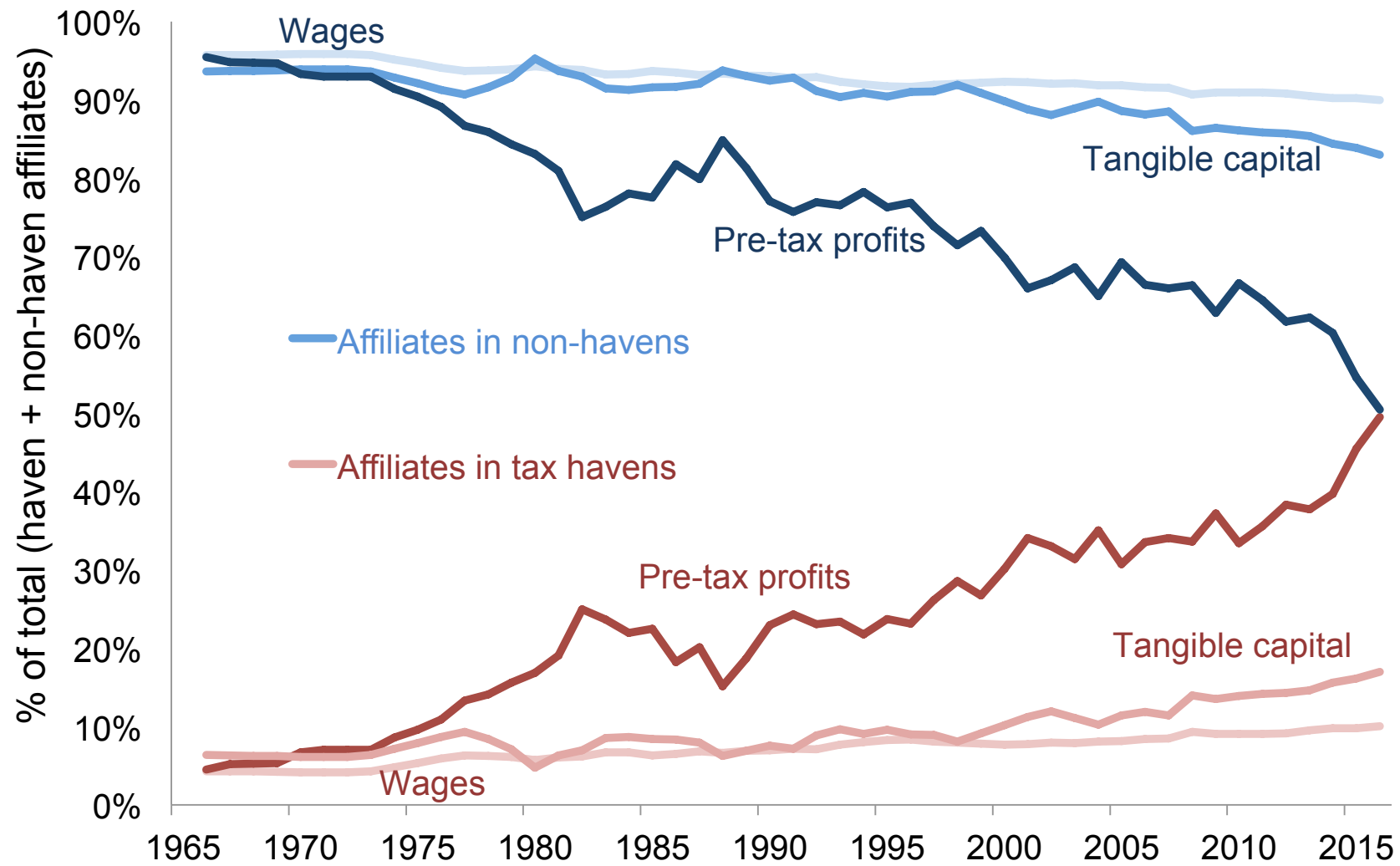
- Annual since 1982, every 5 years back to 1966

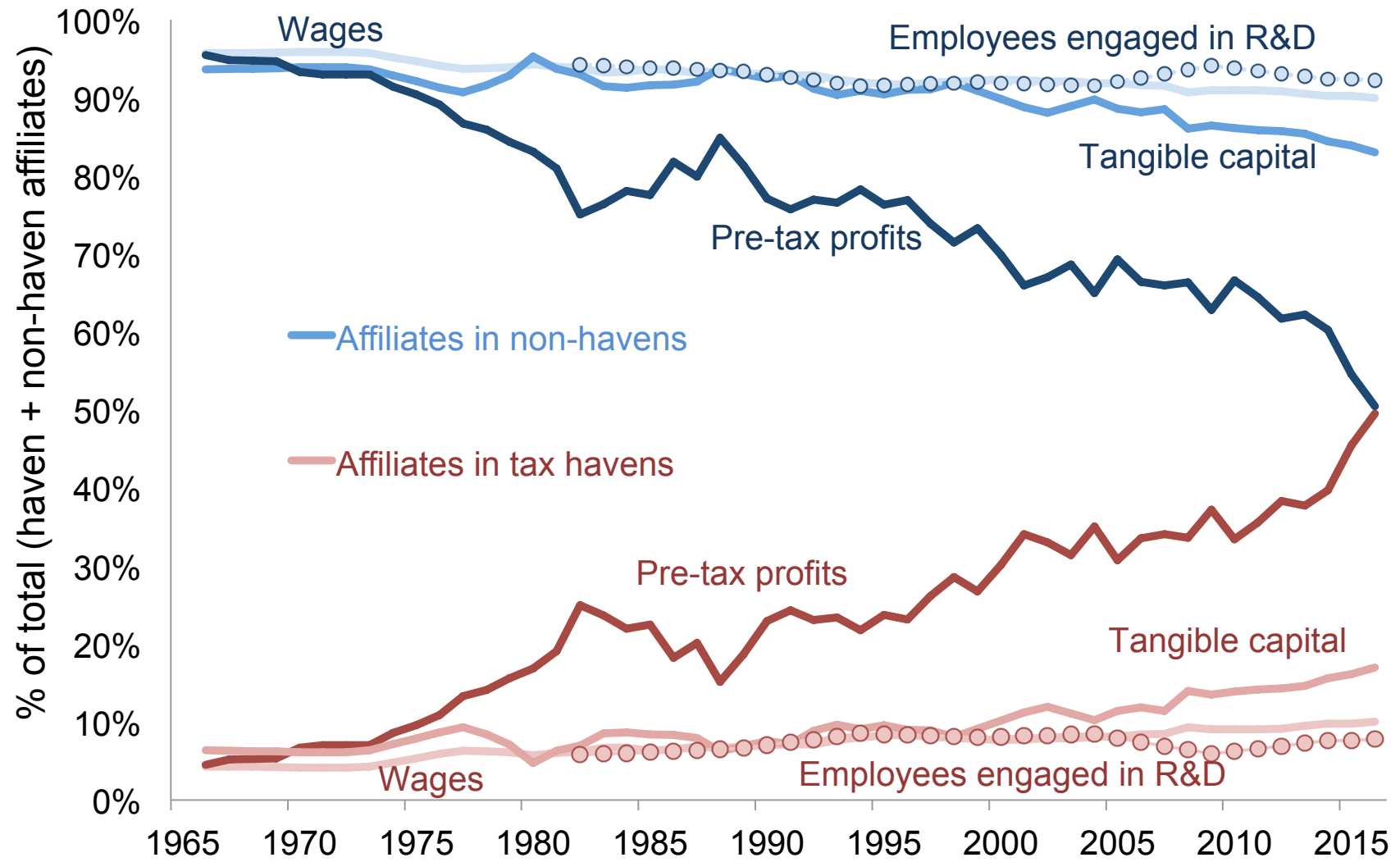
Supplement with IRS tabulations (form 5471)

- Main advantage: annual back to early 1960s

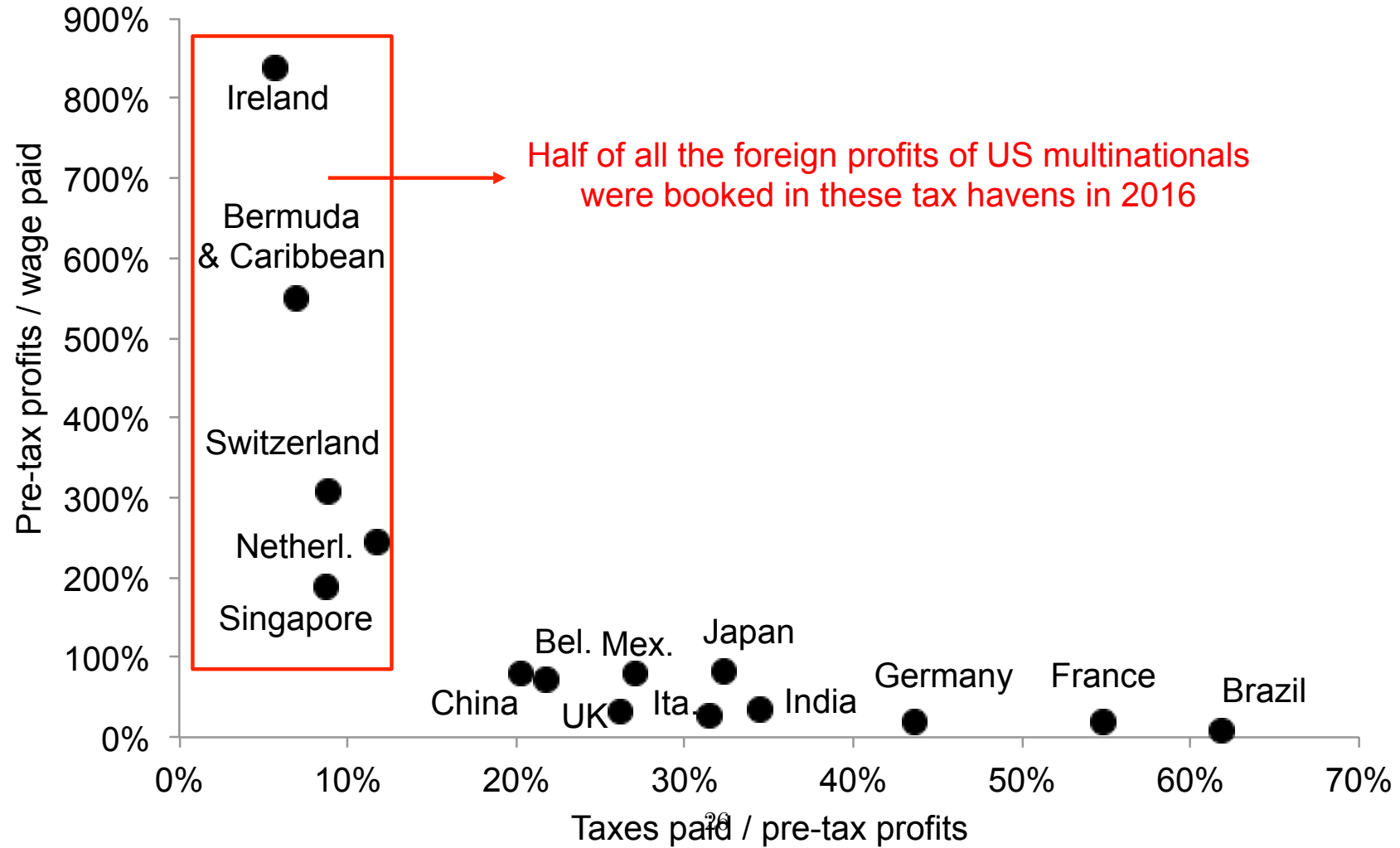








Where do US multinationals book their profits? (majority-owned affiliates of US multinationals, 2016)



Formula apportionment

- Tax base in country i based on shares of global sales, assets, and/or payroll made in i (Gordon and Wilson *Econometrica* '86)
- Used by US states for their own corporate taxes (Clausing '14)
- Key attraction: eliminates the opportunity for companies to engage in profit shifting
- Sales only apportionment removes incentives to move K abroad
- Potential problem of sales through low-tax resellers

Corporate tax integration

- Shareholders receive credits for previously paid corporate taxes
- Corporate tax becomes like a withholding pre-paid tax that is refunded when dividends are paid out to individuals
- Removes incentives to shift profits and move capital abroad
- Existed in Europe; still exists today in Canada, Mexico, Australia
- Can be combined with apportionment to ensure proper withholding at corporate level

Border adjustment (Auerbach 2010)

- Include in corporate tax base value of all imports and deduct the value of all exports
- Similar to VAT border-adjustment (Auerbach & Holtz-Eakin '16)
- In theory, \$ FX must adjust leaving trade balance unchanged
- Like sales apportionment and integration, border adjustment removes incentives to shift profits or move capital abroad
- If combined with full expensing and no interest deduction: DBCFT

Economically DBCFT at $\tau = 20\%$ is equivalent to:

1. Abolish corporate income tax
2. Introduce a value-added-tax on consumption at 20% rate
3. Subsidize labor earnings at 20% rate (like a giant payroll tax cut)

1. is regressive and makes US a corporate tax haven

2. + 3. is equivalent to a tax on existing wealth (progressive)

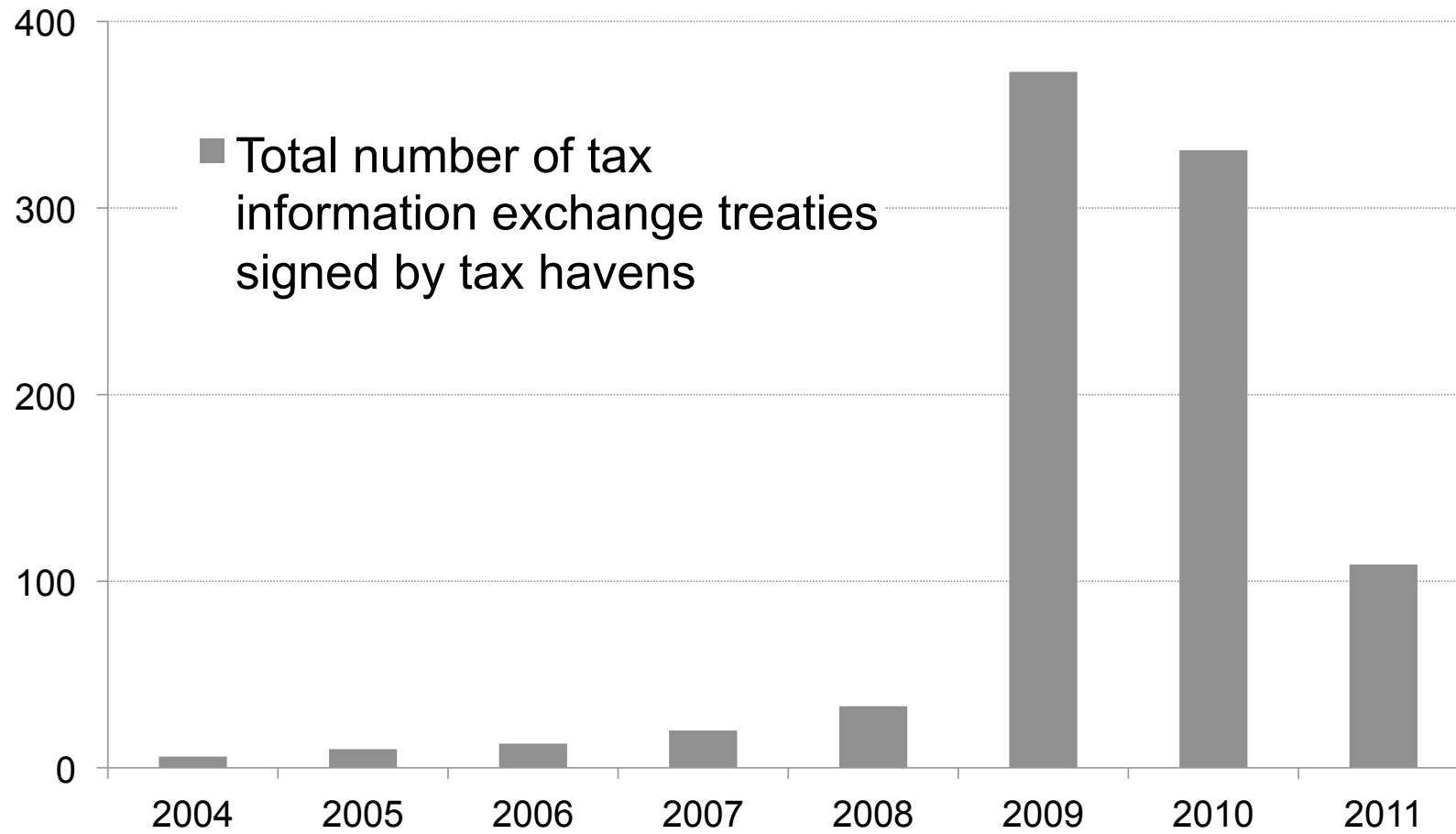
Uncertainties: FX adjustment, foreign business to consumers sales (problem also for VAT), WTO compatibility, long-term revenue effects

3 Cross-border information sharing

- Globalization makes it easy to own assets abroad. Offshore wealth $\approx 8\%$ of world's household financial wealth (Zucman QJE 2013)
- Without third-party reporting on these assets, very easy to evade residence-based taxes (on personal capital income and wealth)
- Traditionally, tax havens exchanged no/very little information
- This is changing (Fatca and similar laws in other OECD countries)
- Two key limits: incomplete cooperation & incentives of tax havens

Pitfalls of incomplete coop. (Johannesen & Zucman '14)

- April 2009: G20 countries force tax havens to sign bilateral information exchange treaties
- But to be compliant a tax haven needs to sign only 12 treaties
- Bilateral data from Bank for International Settlements show bank deposits shifted to havens with no treaty
- Key to have global cooperation (can be enforced with sanctions)



Research design: panel regressions with country-pair fixed effects

$$\log(\text{Deposits}_{ijq}) = \alpha + \beta \text{Treaty}_{ijq} + \gamma_{ij} + \theta_q + \epsilon_{ijq}$$

- i : source country (e.g., France)
- j : host country (e.g., Switzerland)
- Quarterly observations 2004-2011
- Time and country-pair fixed effects

Dependent variable: deposits of savers of country i in banks of country j

VARIABLES	BANK: havens SAVER: non-havens	BANK: havens SAVER: non-havens
Treaty between i and j	-0.1156** (0.0349)	
Treaty (Contemp)		0.0223 (0.6331)
Treaty (+1 quarter)		-0.0927 (0.1300)
Treaty (+2 quarters)		-0.1306** (0.0449)
Treaty (+3 quarters)		-0.1724*** (0.0057)
Treaty (>3 quarters)		-0.1818** (0.0137)
Observations	30,960	30,960
Countrypair FE	YES	YES
Time FE	³⁵ YES	YES

Robust p-values in parentheses, clustered at the country-pair level

Dependent variable: deposits of savers of country i in banks of country j

VARIABLES	BANK: havens SAVER: non-havens	BANK: havens SAVER: non-havens
Treaty between i and j	-0.1659*** (0.0052)	-0.0498 (0.4286)
Saving tax directive (STD)	-0.2161*** (0.0004)	-0.2198*** (0.0003)
# of treaties signed by i with havens other than j	0.0059** (0.0402)	
# of treaties signed by i with havens other than $j \times \text{Treaty}_{ijq}$		0.0001 (0.9719)
# of treaties signed by i with havens other than $j \times (1 - \text{Treaty}_{ijq})$		0.0120*** (0.0033)
Observations	30,960	30,960
Countrypair fixed effects	YES	YES
Time fixed effects	YES	YES

Robust p-values in parentheses, clustered at the country-pair level

References

Auerbach, Alan J. “A Modern Corporate Tax”, Center for American Progress and the Hamilton Project, 2010 (web)

Auerbach, Alan J. and Douglas Holtz-Eakin “The Role of Border Adjustment in International Taxation”, working paper, 2016 (web)

Bertrand, Marianne, Paras Mehta and Sendhil Mullainathan “Ferretting Out Tunneling: An Application to Indian Business Groups”, *Quarterly Journal of Economics* 2002 (web)

Clausing, Kimberly A., “Tax-motivated Transfer Pricing and US Intrafirm Trade Prices” *Journal of Public Economics*, 2003 (web)

Dharmapala Dhammika, and Nadine Riedel, “Earnings Shocks and Tax-Motivated Income-Shifting: Evidence from European Multinationals,” *Journal of Public Economics*, 2013 (web)

Gordon, Roger and John D. Wilson, “An Examination of Multijurisdiction Corporate Income Taxation Under Formula Apportionment”, *Econometrica*, 1986 (web)

Gordon, Roger and James Hines, "International Taxation," *Handbook of Public Economics*, vol. 4, 2002 (web)

Hong, Qing and Michael Smart, "In praise of tax havens: International tax planning and foreign direct investment", *European Economic Review*, 2010 (web)

Johannesen, Niels "Imperfect tax competition for profits, asymmetric equilibrium and beneficial tax havens" *Journal of International Economics*, 2010 (web)

Johannesen, Niels, and Gabriel Zucman "The End of Bank Secrecy? An Evaluation of the G20 Tax Haven Crackdown" *American Economic Journal: Policy*, 2014 (web)

Keen, Michael and Kai Konrad, "The Theory of International Tax Competition and Coordination," *Handbook of Public Economics*, vol. 5, 2013 (web)

Lane, Philip and Gian Maria Milesi-Ferretti, "International Financial Integration", IMF Staff Papers, 2003 (web)

Lane, Philip and Gian Maria Milesi-Ferretti, "The External Wealth of Nations Mark II," *Journal of International Economics*, 2007 (web)

Slemrod, Joel and John D. Wilson, "Tax competition with parasitic tax havens", *Journal of Public*

Economics, 2009 (web)

Torslov, Thomas, Ludvig Wier and Gabriel Zucman, “The Missing Profits of Nations”, NBER working paper 2018 (web)

Wilson, J. D. “A theory of interregional tax competition.” *Journal of Urban Economics*, 1986

Wright, Thomas, and Gabriel Zucman. 2018. ‘The Exorbitant Tax Privilege’, working paper. (web)

Zodrow, George R. “Capital mobility and capital tax competition.” *National Tax Journal*, 2010

Zodrow, George R. and Mieszkowski “Pigou, Tiebout, Property Taxation, and the Under-provision of Local Public Goods” *Journal of Urban Economics*, 1986 (web)

Zucman Gabriel, “The Missing Wealth of Nations: Are Europe and the US net Debtors or net Creditors?”, *Quarterly Journal of Economics* 2013, (web)

Zucman, Gabriel, “Taxing Across Borders: Tracking Personal Wealth and Corporate Profits”, *Journal of Economic Perspectives*, 2014 (web)

Zucman, Gabriel, *The Hidden Wealth of Nations*, University of Chicago Press, 2015 (web)