

Empirical Financial Economics: Part 3

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March 26, 2021

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Tonight's Lecture

- Corporate tax havens and transparency
- Historical slave trade and firm access to finance
- Reaching for yield

Section 1

Corporate Tax Havens and Transparency

Required Reading

- Bennedsen, M. and Zeume, S., 2018. Corporate tax havens and transparency. *The Review of Financial Studies*, 31(4), pp.1221-1264.

Background

- Tax havens are jurisdictions that have corporate or personal tax rates so low that foreign individuals choose to artificially set up business there so as to shield this income from higher tax rates at home or wherever they are doing business.
- The numbers are huge:
 - Zucman (QJE 2013) suggests 8% of global financial wealth of households is held in tax havens.
 - Jansky and Palansky (ITPF 2019) estimate that \$420 billion in corporate profits are shifted each year from 79 countries they examine, amounting to almost 1% of GDP each year, with \$125 billion tax revenue lost (10% of corporate tax revenue).
 - Torslov, Wier and Zucman (2019) estimate the amount of profits shifted to tax havens to be around \$667 billion each year—around 36% of total profit, similarly finding a global tax loss of 9%.
- But tax havens are often more than tax-saving facilities—they are often used to allow managers or controlling shareholders to derive private benefits from the firm, going against the interests of noncontrolling shareholders.

This paper

- This paper tries to examine this **expropriations** effect by measuring the impact of an increase in transparency on firm value.
- The transparency shock is the passage of bilateral Tax Information Exchange Agreements (TIEAs) that allow for the exchange of information relevant to civil and criminal tax investigations.
- While TIEAs do not directly affect firm profits, they do affect possibility of firms' tax-saving schemes being uncovered, and should cause a negative impact on firm value.
- In contrast, if managers use tax havens to hide or steal company resources, then TIEAs increase the likelihood of this activity being uncovered, increasing the value of the firm.

The quasi-experimental setting

- The authors argue that the passage of TIEAs is an ideal quasi-experimental setting because they are *bilateral*, and they were 500 passed at different points in time over the period 2000 to 2012.
- TIEAs affect firms with HQs in one signatory to the treaty who have operations located in the other signatory (the tax haven).
- It leaves untroubled firms with HQs in the same country, but with operations in different tax havens.
- It also leaves firms with HQs in other countries unaffected.

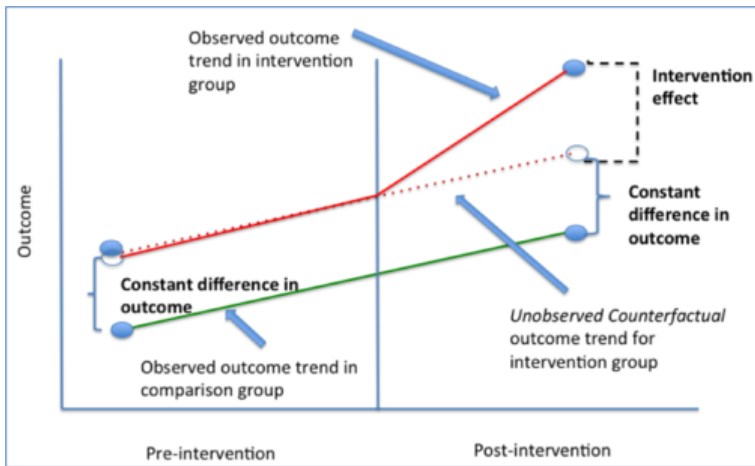
Their data

- They use data from paid data sources: Datastream.
- This has the universe of publicly listed active firms.
- They combine this with a publication called “Who Owns Whom” that provides corporate family trees.
- They use four different tax haven lists, as there is not an agreed-upon definition:
 - The OECD’s Gray List 2009 of tax havens which has 34 countries on it.
 - The Stop Tax Haven Abuse Act with 30 territories on it.
 - The original OECD Tax Haven list from 2001, with 42 territories.
 - A more practical list from Hines and Rice (1994).
- Anguilla (4); Antigua (4); Aruba (4); Bahamas (4); Barbados (3); Bermuda (3); BVI (4); Cayman (4); Dominica (4); Grenada (4); Montserrat (3); St Kitts (4); St Lucia (4); St Vincent (4); Turks & Caicos (4).

Difference-in-differences

- An event happens to one firm at time $t = 1$, but not to another firm.
- First we calculate the effect of the event on the first firm's outcome:
 $\text{Diff}_1 = Y_1(t = 1) - Y_1(t = 0)$.
- Then we calculate the effect of the event on the second firm's outcome:
 $\text{Diff}_2 = Y_2(t = 1) - Y_2(t = 0)$.
- The difference of these differences is *loosely* the causal effect of the event:
 $\text{Diff}_1 - \text{Diff}_2$.
- There are a few assumptions that need to hold for this to be a causal effect:
 - It requires that the two firms had “parallel trends” before the event.
 - It requires that the event happening to one firm rather than the other was unrelated to the outcome (Y).
 - It requires that the effect of firm 1's outcome does not impact firm 2's outcome.

Difference-in-differences



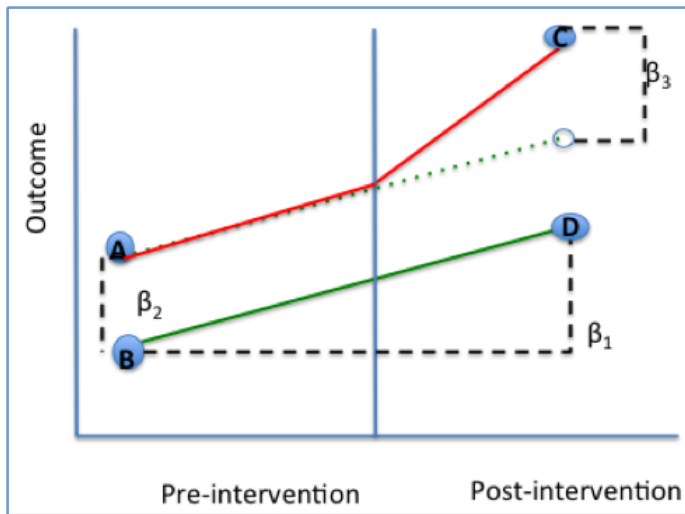
Difference-in-differences

- We can do this same thing in a panel regression approach:

$$Y = \beta_0 + \beta_1 \cdot \text{time} + \beta_2 \cdot \text{treated} + \beta_3 \cdot \text{time} \times \text{treated} + \varepsilon$$

- The values of these coefficients correspond to the simple example above:
 - β_0 is simply the baseline average of both these firms before the event.
 - β_1 is the time trend of the control firm.
 - β_2 is the difference between the treated and control firm *before* the event.
 - β_3 is the difference-in-difference estimate.
- We can also add covariates, to help us control for differences in the characteristics of the firms that might matter for the path of their outcome variables.

Difference-in-differences



Empirical strategy

- They estimate a generalised **difference-in-differences** approach:

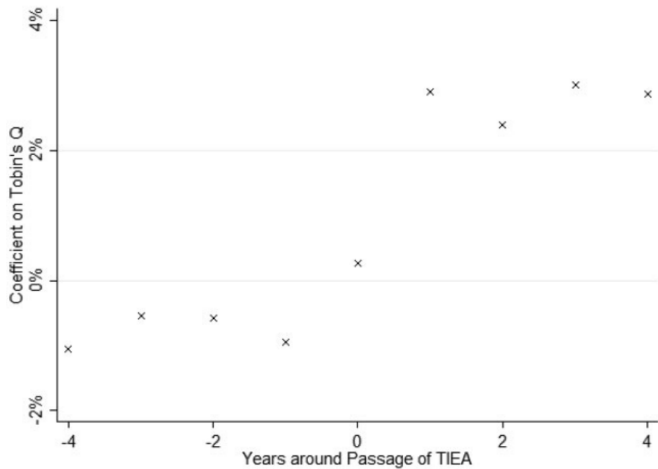
$$y_{isct} = \alpha_i + \alpha_i st + \beta \text{treated}_{ist} + \gamma \text{controls} + \varepsilon_{isct}$$

- The firm is indexed by i , the time by t , the sector they're operating in by s , and the headquarter country by c .
- This compares firms who are “treated” (ie. affected by a TIEA signing) to firms in the same industry who are not “treated”.
- The dependent variable is “firm value”, measured by Tobin's q :

$$\text{Tobin's } q = \frac{\text{firm market value}}{\text{asset replacement cost}}$$

which is the ratio between the market value of an asset and its replacement value.

Results of DiD



Results

- They find that Tobin's q increases by 2.5% after a TIEA is signed for companies affected, relative to companies not affected.
- They find that companies with more complex tax haven structures are affected by more.
- They find that firms affected by TIEAs move from countries with TIEAs to countries without.
- Firms with lower monitoring and governance by noncontrolling owners benefit more from the introduction of TIEAs.

Section 2

The Historical Slave Trade and Firm Access to Finance in Africa

Required Reading

- Pierce, L. and Snyder, J.A., 2018. The historical slave trade and firm access to finance in Africa. *The Review of Financial Studies*, 31(1), pp.142-174.

Background

- Firms that cannot access financing will have no choice but to miss out on profitable investment opportunities.
- Why is there so much variation in access to finance in African economies?
- This paper suggests that the historical effects of the slave trade in Africa persist until today, showing up in modern finance.
- This paper asks whether high historical levels of slave extraction are associated with high current barriers to external finance.

The mechanisms

- The authors argue that the slave trade dramatically altered cultural and institutional factors in the past; first by destroying existing institutions; second by destroying relationships across villages; third by creating a culture of betrayal and insecurity.
- The authors argue that these effects persist until today, relying on evidence that the regions which were more exposed to the slave trade continued to have greater levels of mistrust, among other things.
- Finally, they argue that these lower levels of trust can partially explain the lower levels of formal participation in the banking system, and of lower private credit.

Data

- The first dataset they use is Nathan Nunn's (2008) data set on the number of slaves extracted from different land areas between 1400 and 1900 for the four slave trades.
- This gives data on the log number of slaves extracted per square kilometre for 52 African countries.
- They use data from the World Bank Enterprise Survey between 2006 and 2010, providing 15,000 firm responses for 38 countries in Africa.

Empirical strategy

- They run firm-level regressions examining the probability of reporting access to finance as a major or severe business obstacle:

$$y_{ik} = \beta_0 + \beta_1 \ln(\text{slave exports/area})_k + \gamma \text{controls} + \varepsilon_{ik}$$

- The firm is indexed by i , the country is indexed by k , and controls include both firm-level and country-level controls.
- This is a **linear probability model**:
 - These can potentially produce nonsense predictions (e.g. probabilities < 0 or > 1)
 - Traditional t-tests for significance are invalid
 - It's easy to estimate and interpret, so economists ignore all warnings and use them anyway
 - We should be using probit or logit models instead

Slave exports and self-reported difficulty in access to finance

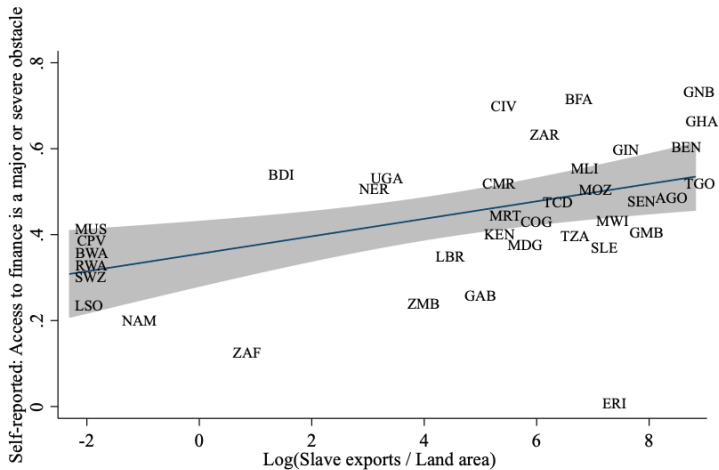


Figure 3

Data come from Nunn (2008) and the World Enterprise Survey. Small changes to the positions of the countries were made to prevent the overlapping of the country labels.

Results

- They find that 28% of countries with the lowest slave-extraction rates report access to finance as a major/severe obstacle.
- They find that 57% of countries with the highest slave-extraction rates report access to finance as a major/severe obstacle.
- They find that slave extraction implies lower access both to formal and informal credit.
- They also show that the lower use of financing is not a result of the lack of demand for credit.
- They re-estimate this model for a range of potential obstacles, showing that only access to finance and access to electricity are consistently linked to historical slave extraction.

Section 3

Low Interest Rates and Risk-Taking: Evidence from Individual Investment Decisions

Required Reading

- Lian, C., Ma, Y. and Wang, C., 2019. Low interest rates and risk-taking: Evidence from individual investment decisions. *The Review of Financial Studies*, 32(6), pp.2107-2148.

Background

- The global financial crises prompted monetary policy makers around the world to respond with interest rates that were as low as they could go.
- “Reach for yield” is described as increasing risk-taking when interest rates are low, holding constant the risk and excess return on risky assets.
- Reach for yield is actually one of the intended impacts of low interest rate policies, aiming to offset a “flight to safety” that happens in the midst of a crisis.

This paper

- In this paper, they examine whether people demonstrate a stronger preference for risky assets when the risk-free rate is low.
- They use a randomized experiment in order to identify whether people's preferences and psychology alters the way they perceive risk and return under different interest rate environments.

Experimental design

- Experiment similar to the simplest capital allocation model possible, where an individual chooses between a risk-free asset and a risky asset.
- Half the participants are randomly assigned to a high interest rate condition, and half to a low interest rate condition.
 - Risk-free rate of 5% and risky return of 10%
 - Risk-free rate of 1% and risky return of 6%
- In both conditions the excess returns on the risky asset is the same and the distribution is the same (volatility of 18%).
- In their experiment, they truncate the risky asset's normal distribution into nine potential outcomes.

Experimental design

- The experiments are really surveys conducted using Amazon's Mechanical Turk (MTurk) online platform for surveys and experiments, and then on Harvard Business School MBA students.
- They consider an experiment on MTurk where participants receive a fixed payment for hypothetical questions about investing \$100,000.
- They also consider an incentivised version where individuals receive both a participation payment and a bonus payment proportional to their investment outcomes. They are asked to invest 100,000 hypothetical francs.
- HBS MBA students receive a \$12 dining hall voucher and could earn a bonus payment proportional to their investment outcomes.

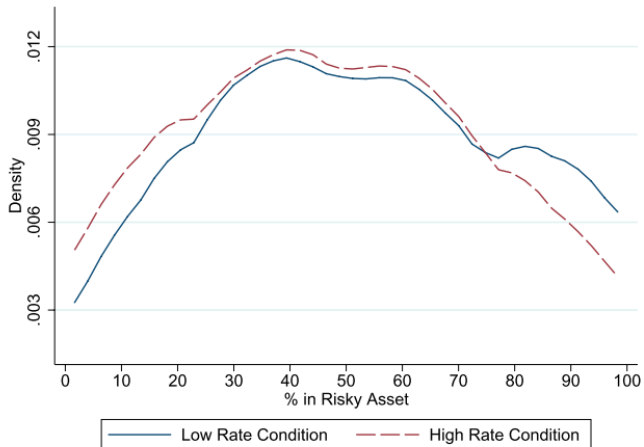
Empirical analysis

- To examine their results, the simplest thing is to consider the average percentage allocation to risky assets in the high interest rate condition to the the average percentage allocation to risky assets in the low interest rate condition.
- But people will always have different levels of risk aversion, so maybe we should check the overall distribution of these allocations.
- We can also examine these results in a regression analysis, controlling for individual characteristics that help make the comparison better:

$$\text{allocation}_i = \alpha + \beta \text{Low}_i + \gamma \text{controls} + \varepsilon_i$$

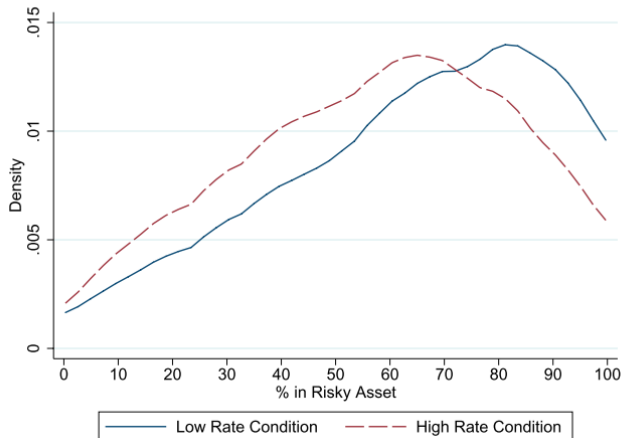
Distribution of allocations

A Experiment B1: MTurk, hypothetical



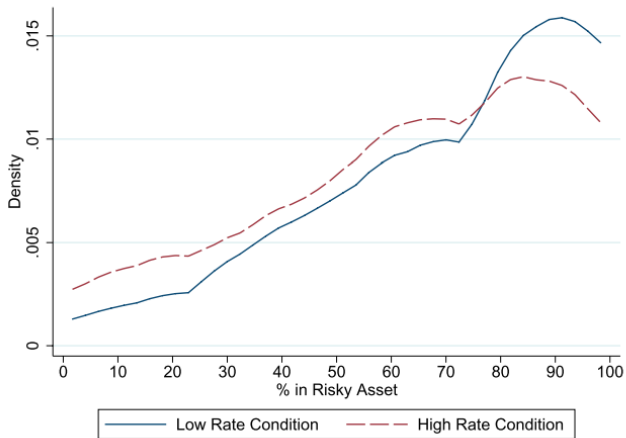
Distribution of allocations

B Experiment B2: MTurk, incentivized



Distribution of allocations

C Experiment B3: HBS MBA, incentivized



Results

- In the fixed payment MTurk experiment, the average allocation to the risky asset increases from 48.15% in the high rate condition to 55.32% in the low rate condition (difference = 7.17pp).
- In the incentivized MTurk experiment, the average allocation to the risky asset increases from 58.58% in the high rate condition to 66.64% in the low rate condition (difference = 8.06pp).
- In the HBS MBA experiment, the average allocation to the risky asset increases from 66.79% in the high rate condition to 75.61% in the low rate condition (difference = 8.83pp).
- Controlling for individual characteristics doesn't change these estimates by very much: 7.69pp, 8.14pp, and 8.76pp respectively.

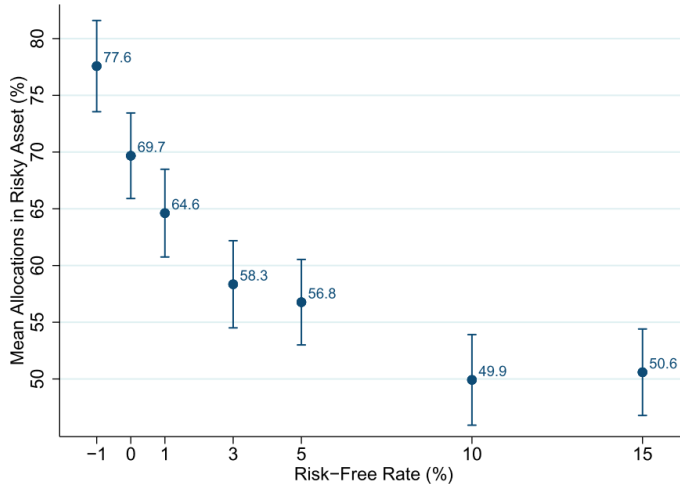
Results

- For an average of 60% allocated to the risky asset in the high rate condition, an 8pp increase is around a 15% increase in the amount invested in risky assets.
- This is equivalent to the average excess returns on the risky asset increasing by 0.7 percentage points in a mean-variance analysis problem.

Nonlinearity

- The authors further test two questions:
 - Is reaching for yield non-linear in the interest rate?
 - Do allocations to the risky asset increase with the interest rate when interest rates are sufficiently high?
- They consider a wider range of interest rate conditions, with the risk-free rate ranging from -1% to 15% .
- They uncover nonlinearity, but no reaching *against* yield.

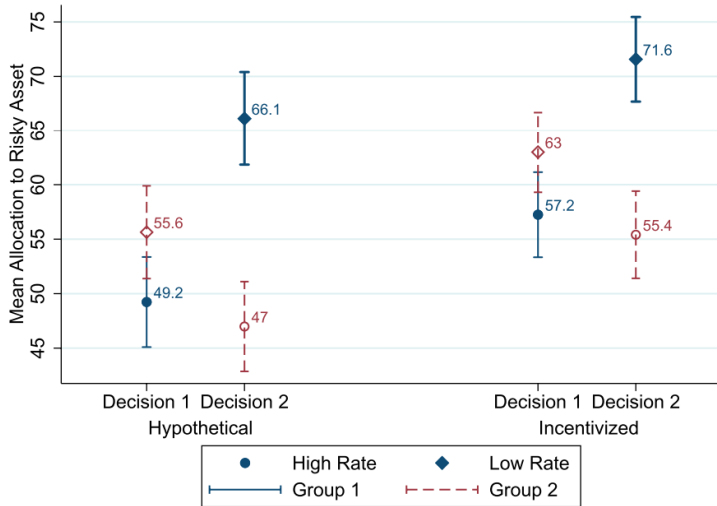
Nonlinearity in allocations



Historical dependence

- The authors also consider whether investment history and reference dependence affects investment decisions.
- They run a new experiment where participants play two rounds:
 - Half begin with the low interest rate condition then move to the high interest rate condition.
 - Half begin with the high interest rate condition then move to the low interest rate condition.
- They find that reaching for yield is present both within and across groups.
- More importantly, they find that those who have the high rate condition first have particularly high allocations to the risky asset in the low rate condition.

Historical dependence



Section 4

Summary

Summary

- There are a wide range of very interesting questions in financial economics, which can be answered by a wide range of methods.
- Most of these questions rely of some form of theoretical underpinning, along with a good knowledge of the world around us to examine these questions.
- Most of these methods are actually quite simple and quite intuitive, and help us to form some conclusions about the *causal effects* of events or policies.
- You don't need to become a researcher, but you need to at least be able to understand and synthesize the findings of researchers.

The End.