Uncertainty and FDI adjustments

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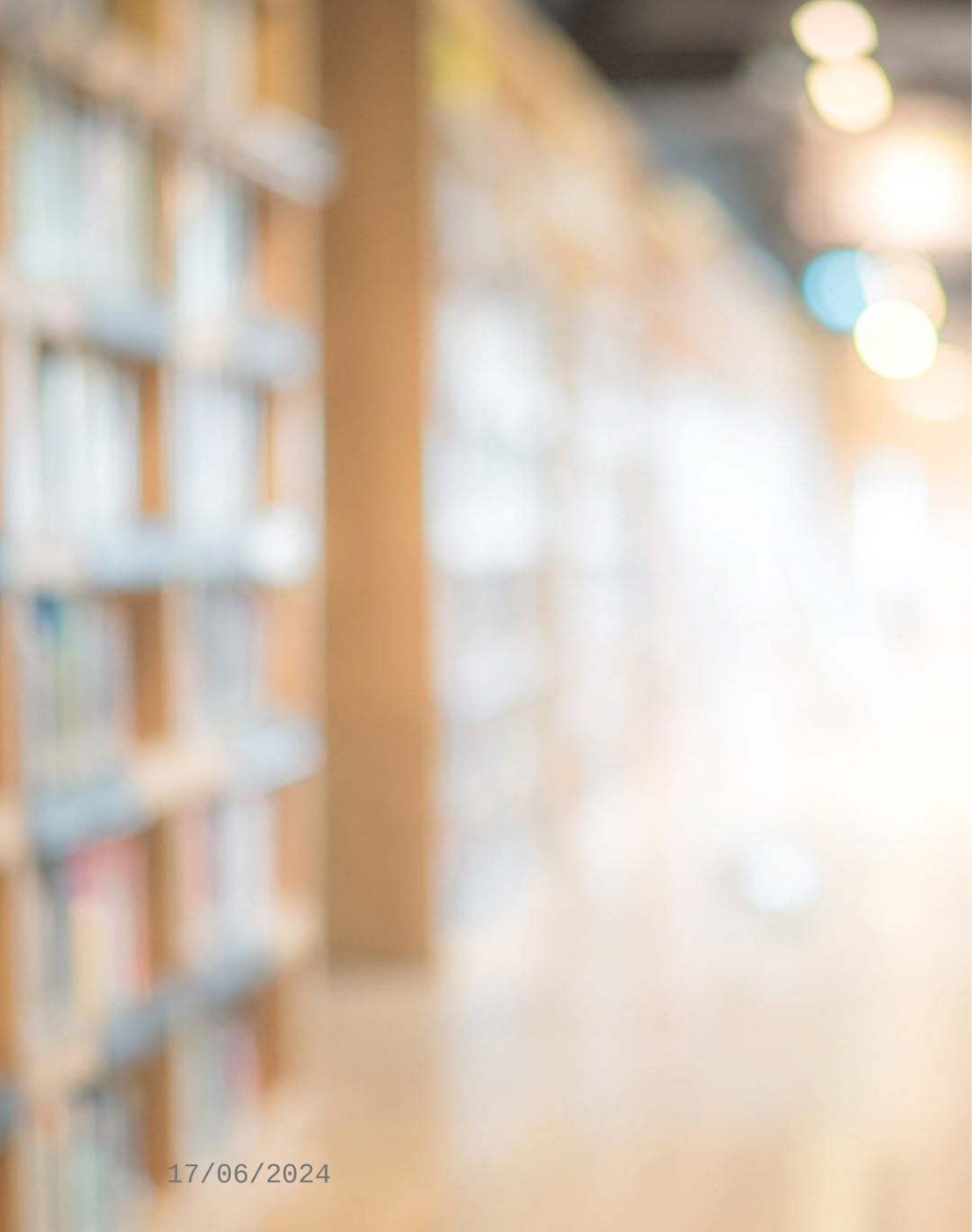
KDI Journal of Economic Policy Conference
Seoul, 14 June 2024



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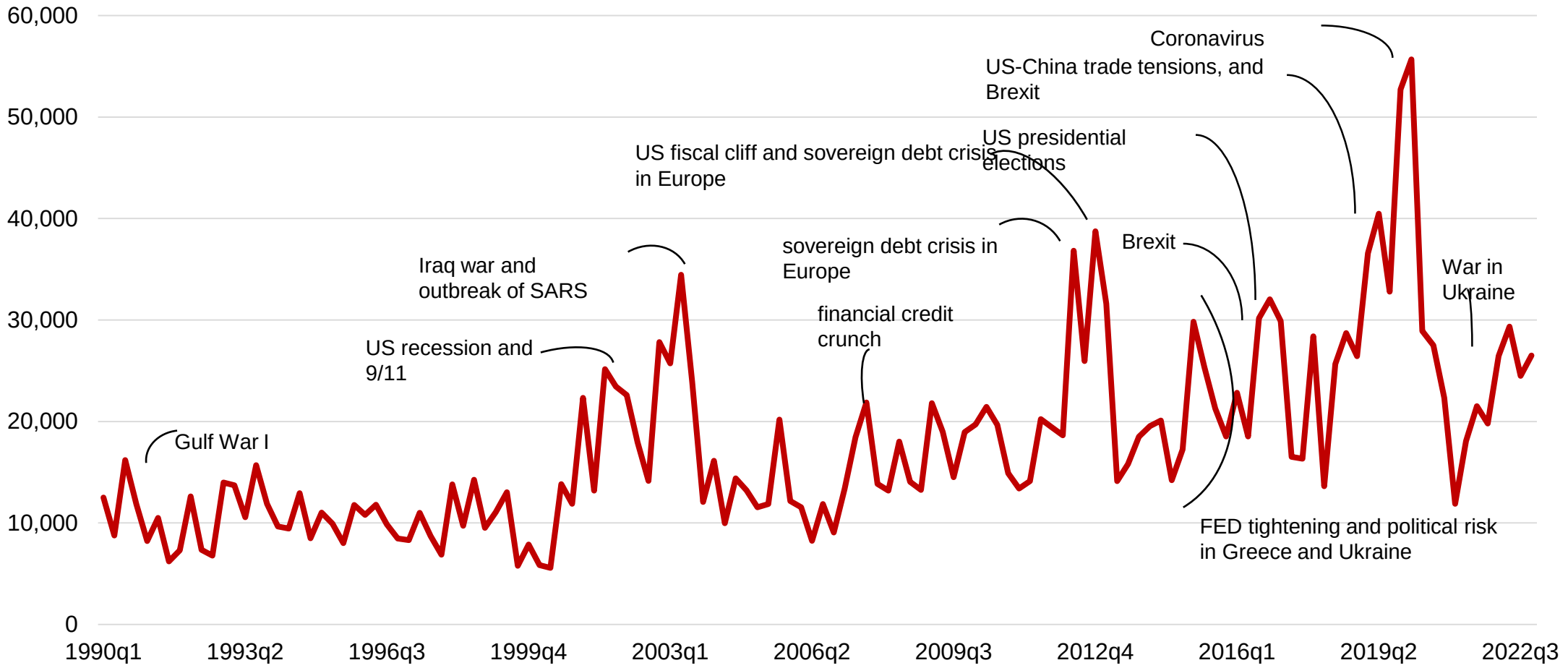
Introduction

- Rising and widespread global uncertainties
  - US-China trade tension: reshoring, re-orientation of the value chain, anti-globalization sentiment.
  - Covid-19: severe supply and demand disruption
  - Climate change: efforts to reduce detrimental environmental impact of trade and industrial activities
  - Ukraine-Russia: energy and food crises, trade measures for environmental purposes

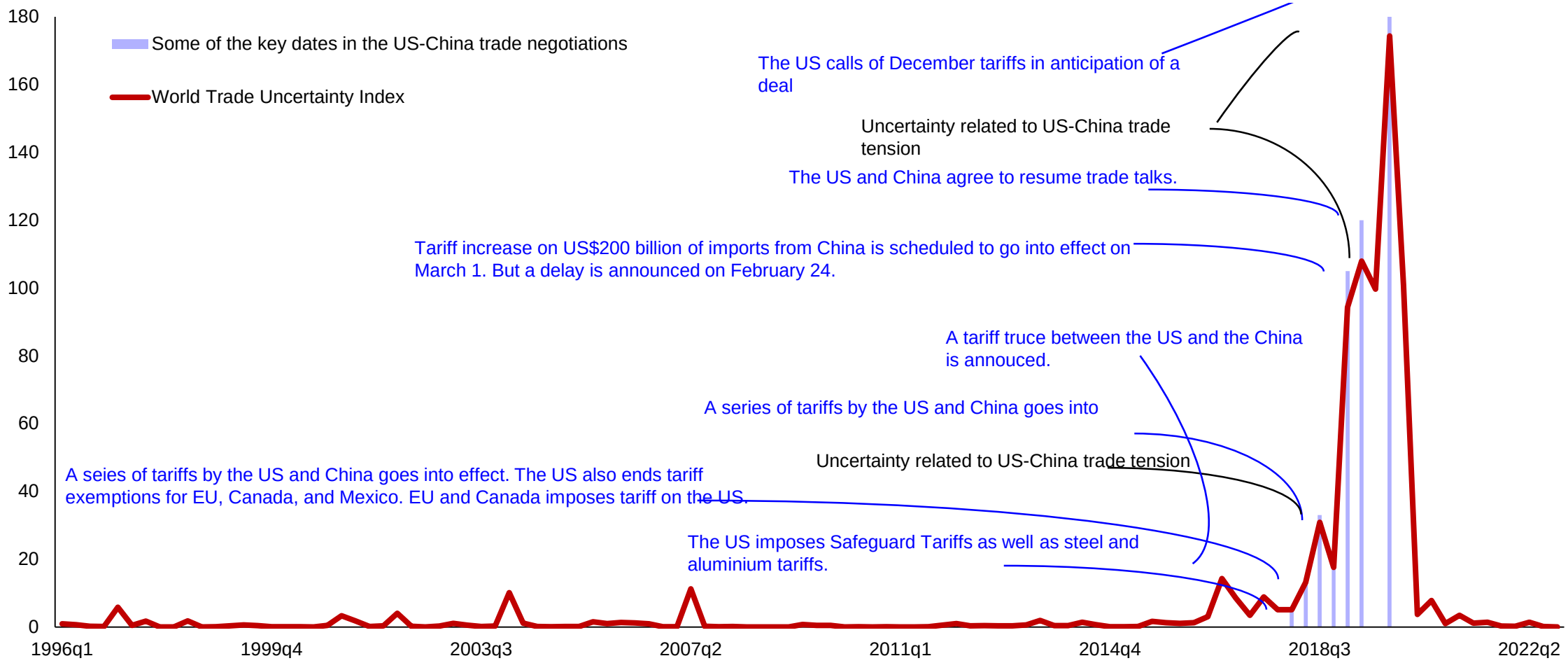
World Uncertainty Index



Source: Ahir, H, N Bloom, and D Furceri (2022), "World Uncertainty Index", NBER Working Paper
Note: GDP-weighted world uncertainty

World Trade Uncertainty Index

Source: Ahir, H, N Bloom, and D Furceri (2022), “World Uncertainty Index”, NBER Working Paper



Introduction

- Contribution of FDI to economic growth is well-documented
  - Market for final products
  - Job creation
  - Technology transfer
  - Knowledge spillover
- The existing literature has devoted significant efforts on examining the determinants of FDI inflows and analyzing various factors affecting the decision of FDI firms
- Few research on FDI and uncertainty, especially at firm-level

Introduction

- Supply chain disruptions and rising uncertainty have brought the risks and potential benefits and costs of geoeconomic fragmentation to the center of the policy debate (IMF, 2023). Companies and policymakers are increasingly looking at strategies to make supply chains more resilient by moving production home or to trusted countries.
- Understanding MNEs’ responses to rising uncertainty is crucial to facilitate policy design to support firms effectively, or, for host countries, to attract more FDI
- Important for supply chain participation and resilience

Research objectives

- This research aims to examine FDI firms' response to uncertainties.
- We ask if FDI firms adjust their extensive margins (the number of markets invested) and intensive margins (the scale of FDI projects in each market) in response to changes in the uncertainties across different host markets.
- We utilize an extensive firm-level dataset covering all FDI projects globally from January 2015 to December 2024, combined with a quarterly database on world uncertainty by Ahir, Bloom and Furceri (2022).

Our contribution

We provide empirical evidence of the impact of uncertainty on foreign direct investment (FDI) using detailed, up-to-date *firm- project-level* data.

Information about firms' announcements →capture early responses to uncertainty.	Global coverage, updated until 2023q4 →US-China trade war, covid-19, UK-Russia war	High-frequency data (analysis conducted at a quarterly level)→capture high uncertainty fluctuations across time.

Global data allows examination of FDI diversion, i.e, relocation of FDI across host markets

Literature Review

- Uncertainty- Concept and Measurement
  - Conventional measures
    - Volatility of financial variables such as the stock market or credit rating indicates investor mood or risk aversion (Asamoah et al., 2016; Bloom, 2009; Cai et al., 2018; Choi & Furceri, 2019).
    - Politics-related measures: Elections and political risk were also investigated as potential sources of uncertainty (Gulen & Ion, 2015; Honig, 2020; Julio & Yook, 2016).
    - Huang, Wu, Yu, and Zhang (2015) use crises occurrences as a proxy for political risk
  - More innovative: news-based measures: Text mining technique based on certain criteria related to uncertainty
    - Baker et al. (2006): Economic Policy Uncertainty Index
    - Caldara and Iacoviello (2022): Geopolitical risk index (adverse geopolitical events and associated risks)
    - Ahir et al. (2018): World Uncertainty Index

Literature Review

- FDI relocation/diversion
  - Belderbos and Zou (2006) document the magnitude and pattern of foreign divestment and relocation by Japanese electronics firms in East Asian countries during 1995-2003.
  - Flaaen, Hortacsu, and Tintenot (2020) find that the US antidumping duties against South Korea and China accompanied downward or minor price movements and production relocation to other export platform countries.

Literature Review

- Uncertainty and trade, FDI and supply chain
  - Fajgelbaum, Goldberg, Kennedy, Khandelwal, and Taglioni (2023) examine the impact of the US-China trade war on trade opportunities for bystander countries and find that it generally enhanced trade opportunities for most countries rather than just causing shifts in trade patterns across destinations.
  - Using quarterly data on the foreign affiliates of Japanese MNCs, Sun, Tao, Yuan, and Zhang (2019) show that, relative to affiliates in other Asian countries, Chinese affiliates, especially those with high exposure to trade with North America, see a decline in sales after the trade war.
  - Grossman, Helpman, and Redding (2024) estimate that the US tariffs on China result in a welfare loss of 0.12 percent of GDP, with substantial contribution from changes in input sourcing and search costs.

Data

- Firm-project level data: Financial Times’ fdimarkets database

  - Records announced greenfield investments globally from various data sources: media sources, industry organizations and investment promotion agencies, market research, and publications companies, etc., at the project level. The complete database provides monthly information covering manufacturing and services sectors from January 2003, divided into company and project databases.

  - The company database contains information about the FDI firms, including their year of establishment, total capital, revenue, and employment at the most recent update, as well as aggregate statistics on their FDI projects. However, the firm’s characteristics data is not available for all firms.

  - The project database contains information on each individual project, including the names of the parent company and the FDI firm, their location, sector and activity, employment, and capital of the projects. Detailed textual information about the project is also explained.

Data

- Firm-project level data: Financial Times' fdimarkets database

  - We extract raw information for manufacturing activities from January 2015 to December 2023. Based on the description, we match the sectors from FDImarket to the 2-digit International Standard Industrial Classification (ISIC) revision 4.

  - We aggregate this project database to quarterly data at the firm-destination country level. We also link the project database to the company database using the company's ID.

Data

- World Uncertainty Index
  - We utilize the World Uncertainty Index Database by Ahir, Bloom, and Furceri (2018). Quarterly data for 143 countries from 1996Q1 to 2023Q4 is available.
  - The index is developed using a text mining technique based on all the country reports from the Economic Intelligent Unit. In particular, the number of times uncertainty is mentioned in the EIU country reports. Keywords include words “uncertain,” “uncertainty,” and “uncertainties.”
  - Then, the raw counts are scaled by the total number of words in each report to make the WUI comparable across countries.

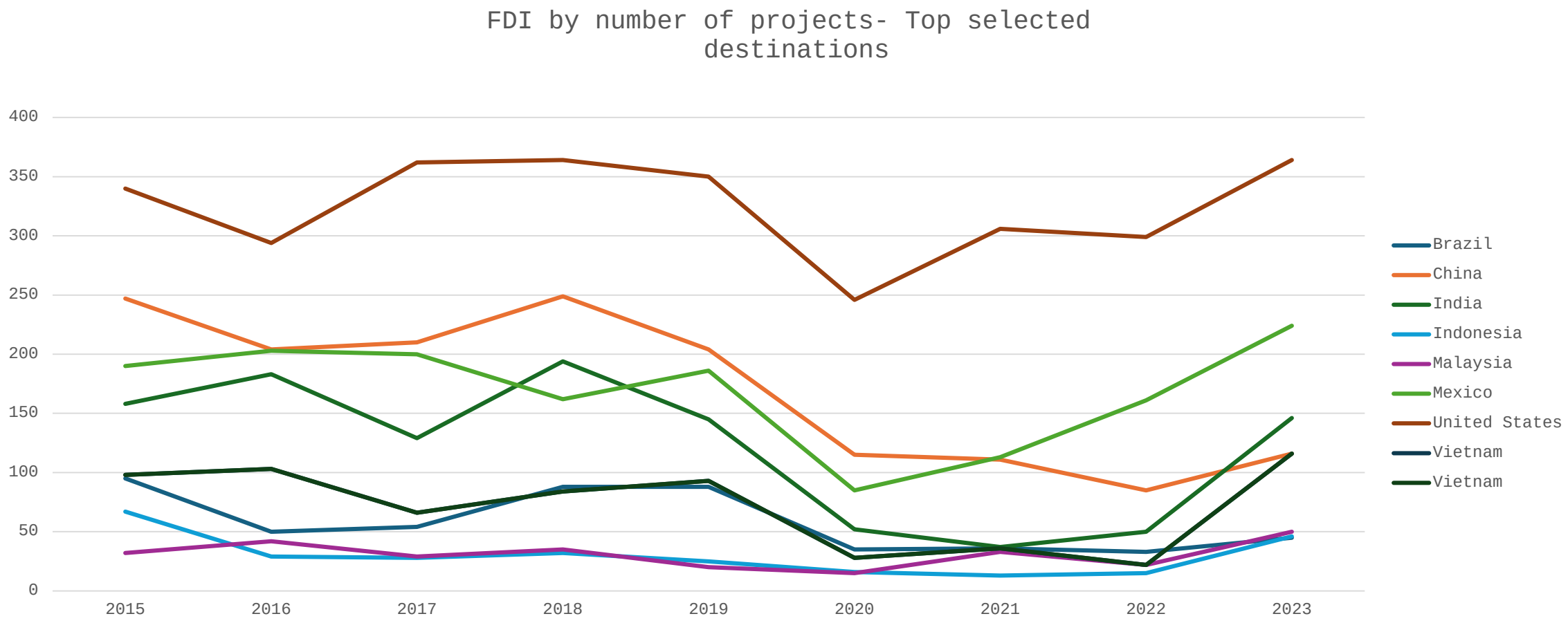
Methodology

$$\ln(Cap_{isdt}) = \alpha_i + \theta lnWUI_{dt,t} + \beta(lnWUI_{dt,t} * lnNb.Host_{ist}) + \delta X_{dt,t} + \gamma_t + \varepsilon_{i,t} \quad \textbf{(Eq. 1)}$$

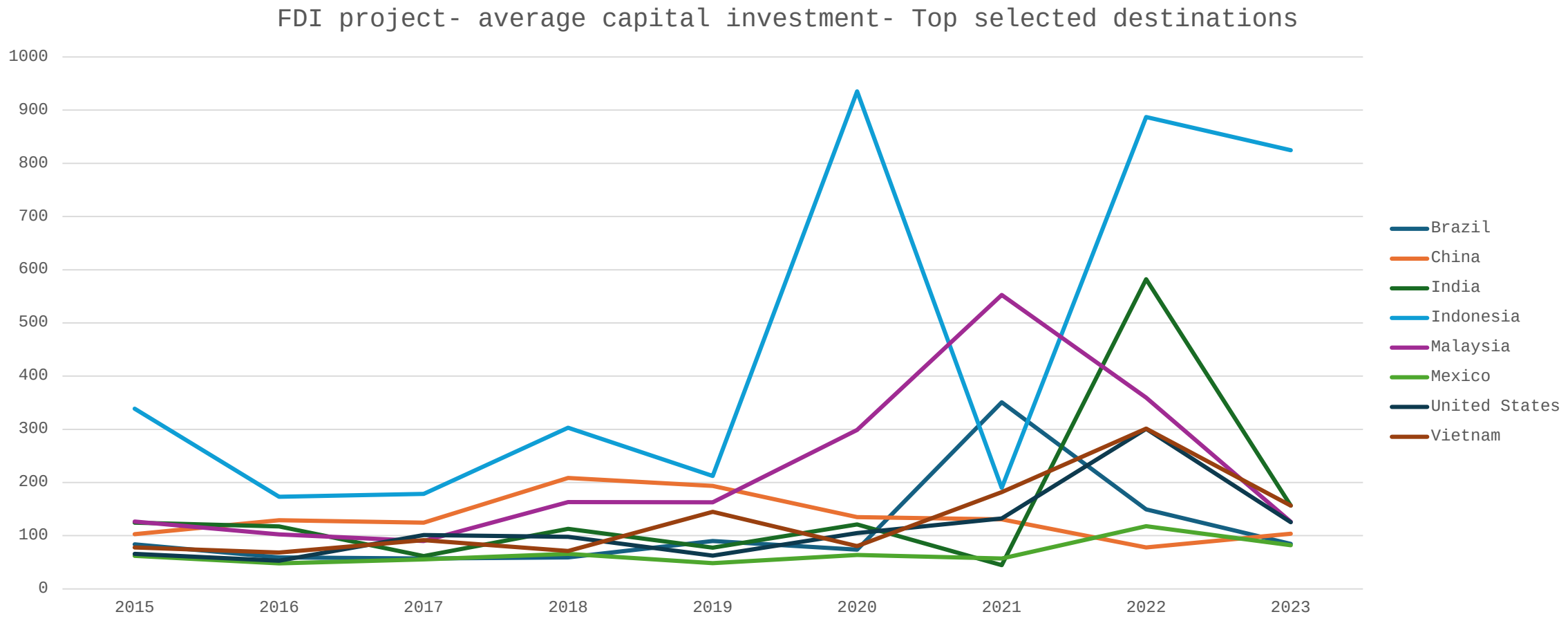
$$\ln(Job_{isdt}) = \alpha_i + \theta lnWUI_{dt,t} + \beta(lnWUI_{dt,t} * lnNb.Host_{ist}) + \delta X_{dt,t} + \gamma_t + \varepsilon_{i,t} \quad \textbf{(Eq. 2)}$$

$$\ln(Project\_nb_{isdt}) = \alpha_i + \theta lnWUI_{dt,t} + \beta(lnWUI_{dt,t} * lnNb.Host_{ist}) + \delta X_{dt,t} + \gamma_t + \varepsilon_{i,t} \quad \textbf{(Eq. 3)}$$

Descriptive statistics



Descriptive Statistics



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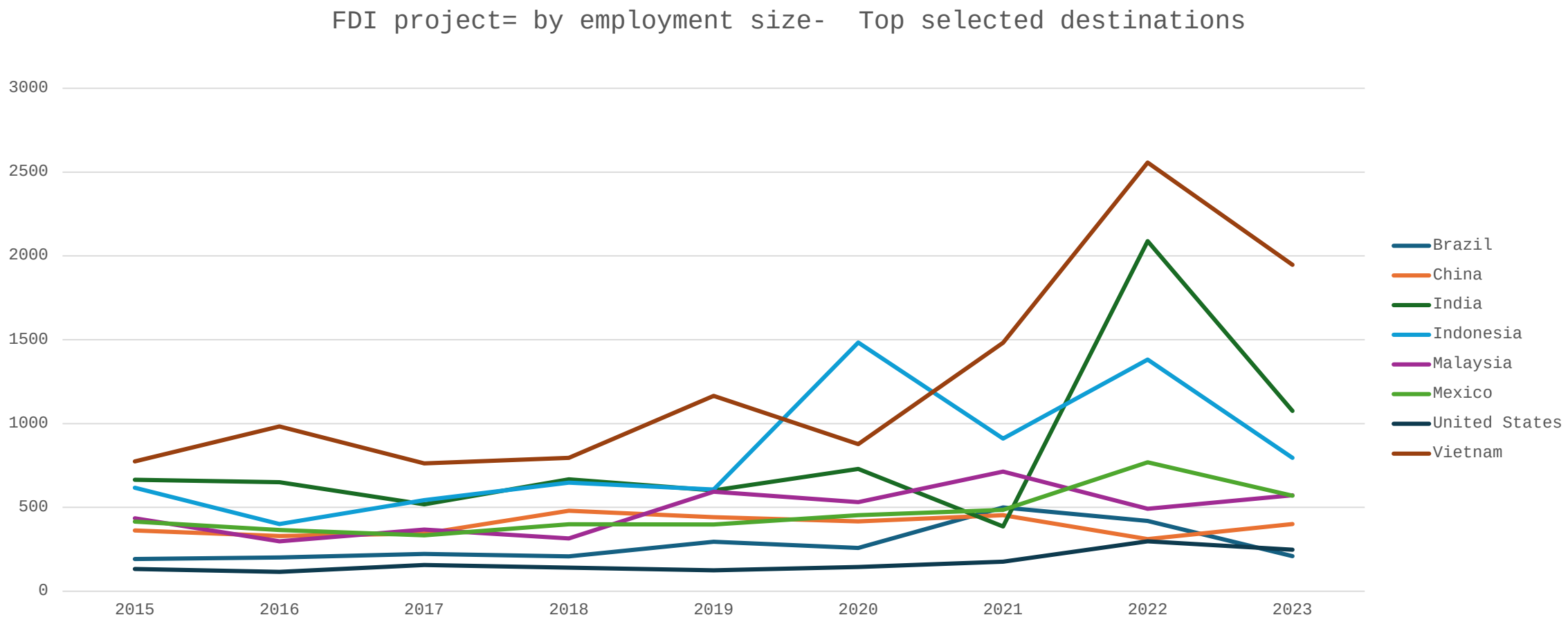

Summary Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
realcap_qt	19,977	120.9368	656.5356	0.014442	31648.97
job_qt	20,012	337.98	1038.421	0	77444
proj_nb_dt	20,012	31.9932	27.80197	1	111
wui_dest	20,012	0.276565	0.239509	0	1.921885
realgdp_dest	12,039	1340034	1831436	2586.482	4961792
host_nb	20,012	12.81401	20.20772	1	121
wui_dt*host_nb	20,012	0.439968	0.457459	0	4.969491

Baseline results

VARIABLES	Dep var: lncap_qt	Dep var: lnjob_qt	Dep var: lnpro_nb_dt
lnwui_dest	-2.710***	-2.269***	0.650***
	(0.0855)	(0.0862)	(0.0618)
wui_dt*host_nb	0.828***	0.494***	-0.0563**
	(0.0312)	(0.0314)	(0.0225)
Constant	3.668***	5.074***	2.937***
	(0.0170)	(0.0171)	(0.0123)
Observations	19,977	20,012	20,012
R-squared	0.049	0.034	0.008
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1			

Model with control variables

VARIABLES	Dep var: lncap_qt	Dep var: lnjob_qt	Dep var: lnpro_nb_dt
lnwui_dest	-2.434***	-1.315***	0.519***
	(0.0984)	(0.0983)	(0.0481)
wui_dt*host_nb	0.884***	0.504***	-0.0578***
	(0.0356)	(0.0355)	(0.0174)
lngdp_dest	0.0540***	-0.0962***	0.482***
	(0.00702)	(0.00702)	(0.00343)
Constant	2.816***	5.863***	-3.196***
	(0.0920)	(0.0920)	(0.0450)
Observations	12,029	12,039	12,039
R-squared	0.060	0.035	0.626

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model with time FE

VARIABLES	Dep var: lncap_qt	Dep var: lnjob_qt	Dep var: lnpro_nb_dt
lnwui_dest	-2.379***	-1.188***	0.592***
	(0.105)	(0.104)	(0.0500)
wui_dt*host_nb	0.886***	0.509***	-0.0546***
	(0.0353)	(0.0352)	(0.0169)
lngdp_dest	0.0506***	-0.0992***	0.486***
	(0.00698)	(0.00698)	(0.00334)
Quarter dummies	Yes	Yes	Yes
Constant	2.795***	5.843***	-3.203***
	(0.115)	(0.115)	(0.0552)
Observations	12,029	12,039	12,039
R-squared	0.081	0.057	0.651

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model with time and sector FE

VARIABLES	Dep var: lncap_qt	Dep var: lnjob_qt	Dep var: lnpro_nb_dt
lnwui_dest	-2.076***	-0.962***	0.671***
	(0.100)	(0.0987)	(0.0493)
wui_dt*host_nb	0.707***	0.387***	-0.0846***
	(0.0347)	(0.0341)	(0.0171)
lngdp_dest	0.0605***	-0.0783***	0.490***
	(0.00658)	(0.00648)	(0.00324)
Quarter dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
Constant	2.512***	5.756***	-3.169***
	(0.134)	(0.132)	(0.0659)
Observations	12,029	12,039	12,039
R-squared	0.193	0.198	0.675

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Model with time, sector and country FE

VARIABLES	Dep var: lncap_qt	Dep var: lnjob_qt	Dep var: lnpro_nb_dt
lnwui_dest	-1.517***	-0.936***	0.0704***
	(0.111)	(0.101)	(0.0255)
wui_dt*host_nb	0.712***	0.431***	-0.0144*
	(0.0339)	(0.0307)	(0.00776)
lngdp_dest	0.196	-0.105	0.659***
	(0.186)	(0.169)	(0.0427)
Quarter dummies	Yes	Yes	Yes
Sector dummies	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes
Constant	1.346	5.998***	-4.487***
	(1.537)	(1.396)	(0.352)
Observations	12,029	12,039	12,039
R-squared	0.247	0.362	0.934

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Conclusion

- Using firm-level data, we try to identify FDI diversion – the phenomenon of companies redirecting FDI flows between countries in response to various factors, including uncertainty.
- By empirical evidence, we show that firms tend to divide risk by redirecting FDI from a small group of large projects to a larger group of small projects.
- We also find that the diversion of markets helps firms to mitigate uncertainty.
- Finally, firms prefer to invest in high value-added sectors rather than labor-intensive sectors.

Next steps

- Firm heterogeneity (employment size, revenue, age)
  - MNEs firms →large
- Robustness check
  - Endogeneity
  - Different measures of uncertainty