

Resource discoveries and FDI bonanzas

Gerhard Toews
University of Oxford

Pierre-Louis Vézina
King's College London

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New discoveries of natural resources in several African countries including Ghana, Uganda, Tanzania and Mozambique raise an important question: will these windfalls be a blessing that brings prosperity and hope, or a political and economic curse, as has been the case in so many countries?

Joe Stiglitz (2012)

*What happens to a **developing** economy following a large oil or gas discovery **before production starts**?*

What we know

- The *prospect of resource wealth* unleashes political forces (Venables, 2016).
- In countries with large discoveries (public) investment increases right after the *news shock* hits, creating a *pre-boom boom* (Arezki et al., 2017).

⇒ Discoveries have economic consequences, before production starts.

What we do

- 1 We look at the effect of large oil or gas discoveries on foreign direct investment (FDI) into developing economies.
- 2 Using Mozambique as a case study we explore the consequences of FDI on local labour markets.

Why FDI?

- FDI is a key part of economic development (Hirschman, 1957)
 - Important source of finance for developing countries;
 - Transfers technology, skills, management practices;
 - Creates higher-paid jobs.

Why we care?

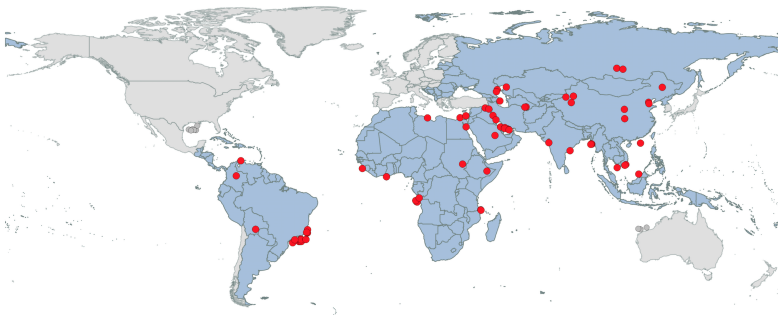
- 1 We know little about the effect of news in developing economies where FDI is likely the main source of investment.
- 2 In light of the resource curse it is important to evaluate whether oil and gas discoveries attract or deter FDI.

Results preview

In the 2 years following a large discovery:

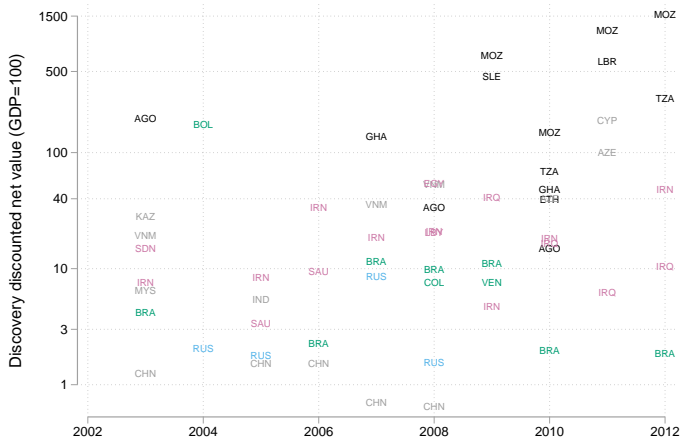
- Non-extraction FDI inflows increase by 73%
- Number of FDI projects increase by 37%
- Number of sectors and source countries increase by 20%
- Number of jobs created increase by 20%

Discoveries in non-OECD countries (since 2003)



Source: Horn, M. and Myron K. 2011. Giant Oil and Gas Fields of the World. *Giant* means at least a total of 500 million barrels of ultimately recoverable oil equivalent

Data on large discoveries



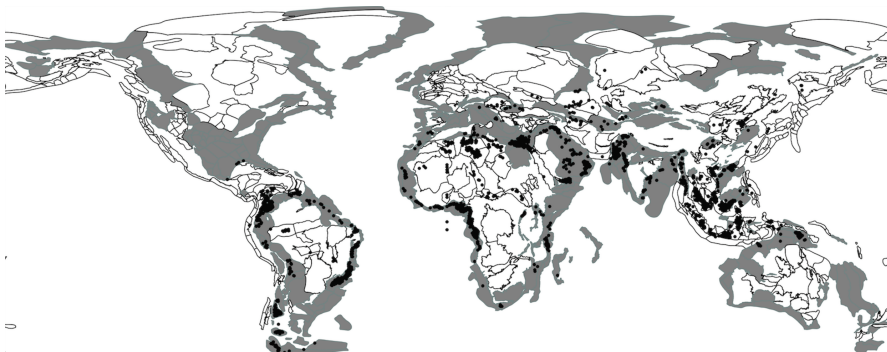
Are large discoveries random?

- Probability of a large discovery is 2-3%;
- Several studies treat large discoveries as an exogenous source of variation (Arezki et al., 2017; Tsui, 2011; Lei and Michaels, 2014).
⇒ Timing of giant oil discoveries is plausibly exogenous and unpredictable due to the uncertain nature of exploration.

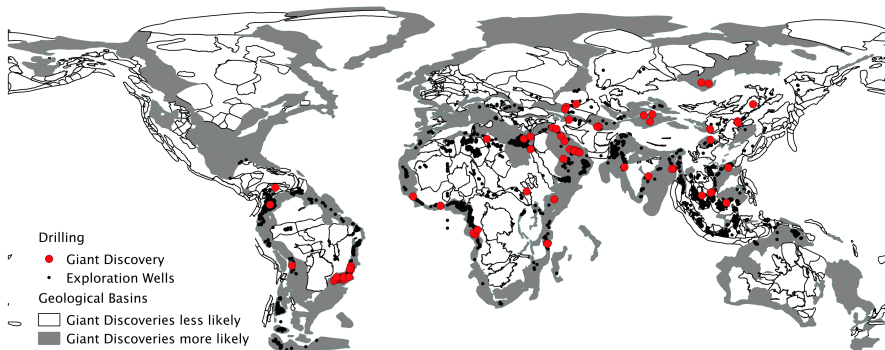
Structural Basins



Drilling in non-OECD countries



Giant discoveries in non-OECD countries



Are large discoveries random?

An example of the uncertain nature of explorations:

- In 2010 Lundin Petroleum made the largest discovery of the year (and one of the biggest ever for Norway).
- It was found within 3 meters of where Elf Aquitaine drilled but failed to find oil in 1971.

Estimation

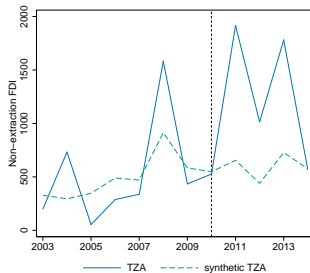
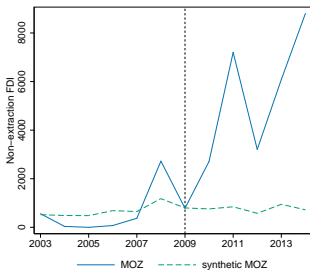
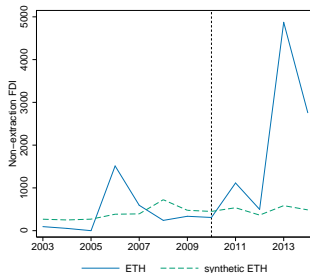
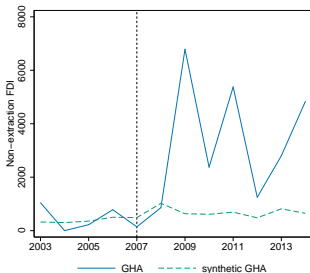
$$FDI_{it} = \beta D_{it} + \alpha_i + \sigma_t + \epsilon_{it}$$

D_{it} which is dummy equal to 1 in the year of the discovery and the two subsequent years.

Country fixed effects (α_i) pick up factors that vary little year-on-year such as institutions or market potential.

Global factors such as the oil price are picked up by year fixed effects (σ_t).

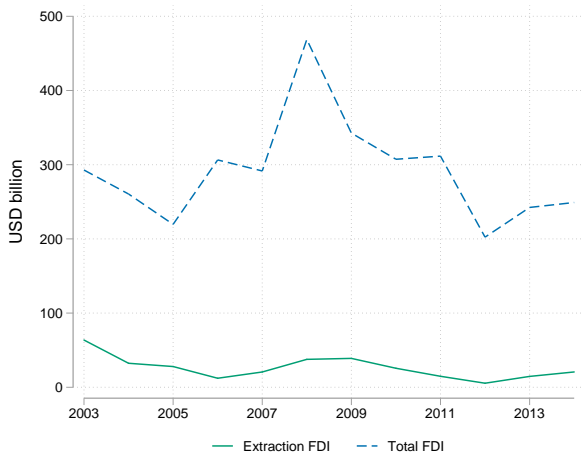
Discovery countries vs. synthetic counterfactuals



Data on FDI

- ① Source: fDiMarkets (part of the Financial Times Group);
- ② Data at the project level on value of investment and jobs created;
- ③ As a **novelty**, the data allows us to decompose FDI into extensive and intensive margins (number of projects vs. average value of projects, as well as number of sectors and source countries).

FDI to discovery countries



Note: Extraction FDI is as defined by fDi Intelligence.

Results - Non-extraction FDI

	(1)	(2)	(3)	(4)
	FDI (USD million)	Nb projects	Avg project size	Jobs created
Discovery in past 2 years	0.594** (0.264)	0.303** (0.126)	0.314 (0.211)	0.549* (0.251)
N	1080	1080	1080	1080
R-sq	0.72	0.90	0.41	0.75

Results - Extensive margin

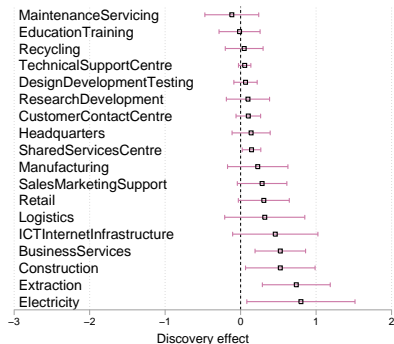
	(1)	(2)	(3)
	Nb source countries	Nb sub-sectors	Nb sectors
Discovery in past 2 years	0.188** (0.078)	0.193* (0.088)	0.158** (0.071)
N	1080	1080	1080
R-sq	0.86	0.89	0.86

Discovery effect on FDI by business activity

Largest city



Rest of country



Robustness

- Previous number of giant discoveries
- Change the counterfactual
- Something specific about the countries (eg openness) ▶ Randomization
- Flexible specification ▶ Leads and Lags
- Different time horizon ▶ Time Horizon
- UNCTAD Data ▶ UNCTAD
- Heterogeneity ▶ Heterogeneity

Conclusion

- Large oil and gas discoveries lead to FDI bonanzas;
- FDI in non-extractive sectors increases by around 70%;
- Driven by the extensive margin, i.e. by new projects, in new sectors, from new source countries;

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Gerhard Toews
University of Oxford

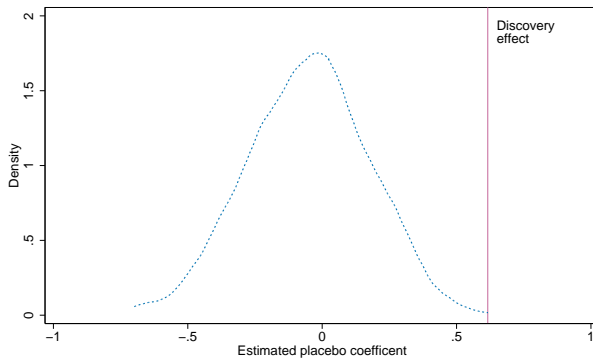
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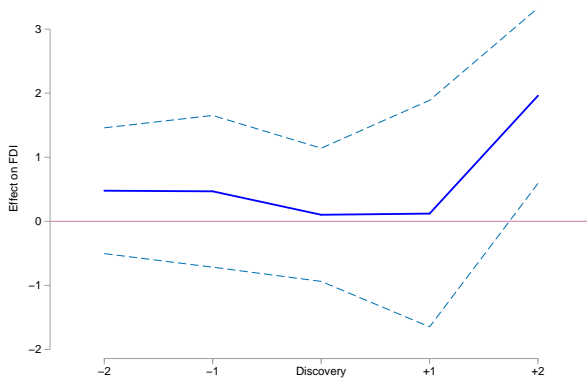
Estimation

- To include the zeros in the FDI data we use an inverse hyperbolic sine transformation (Burbidge et al., 1988; MacKinnon and Magee, 1990);
- ... or a Poisson pseudo-maximum likelihood estimator (Silva and Tenreyro, 2006).
- We cluster standard errors two ways, by year and country.

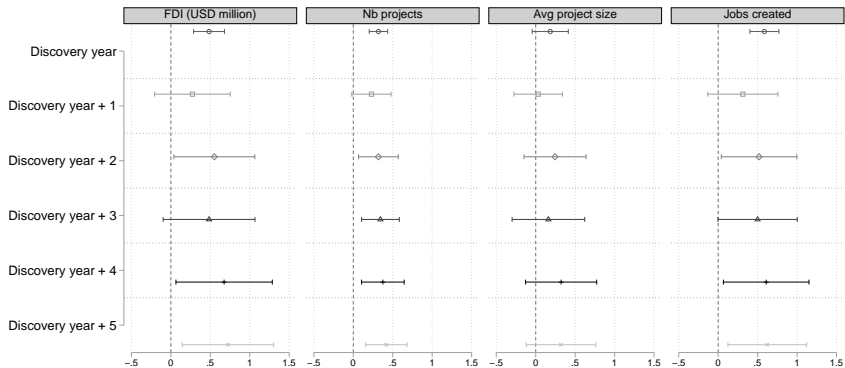
100 placebo discovery effects (Within country shuffles)



Leads and lags: First discoveries



Discovery effect on FDI: Varying time horizons



Robustness to UNCTAD data and longer time period

Period 1970-2014			
	(1)	(2)	(3)
	FDI	FDI	FDI
Discovery in past 2 years	0.484** (0.185)	0.486** (0.185)	0.434** (0.166)
N	8731	7523	6527
R-sq	0.73	0.74	0.75
Sample countries	Non-OECD	Exploration	Discovery
Period 2003-2014			
	(1)	(2)	(3)
	FDI	FDI	FDI
Discovery in past 2 years	0.488 (0.301)	0.460 (0.299)	0.525 (0.307)
N	1992	1080	300
R-sq	0.81	0.74	0.65
Sample countries	Non-OECD	Exploration	Discovery

Heterogeneity of the FDI effects across countries

