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Applied Microeconometrics

Group Project A

Insert Title

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Contents

List of Tables

1 Introduction

2 Theoretical Background/Literature Review

2.1 FDI

2.2 PSM

Since (I guess) we will be focussing on ATE rather than ATT, we need to satisfy the following two assumptions:

1. Assumption: **Unconfoundedness (CIA)**
   "*[G]iven a set of observable covariates X which are not affected by treatment, potential outcomes are independent of treatment assignment*" (**?**, p. 35)

2. Assumption: **Overlap**
   "*persons with the same X values have a positive probability of being both participants and nonparticipants*" **?**, p. 35

–> if Assumption 1 holds, all biases due to observable components can be removed by conditioning on the propensity score (Imbens, 2004).

Binary Treatment

Difference between logit and probit lies in the link function. Logit assumes a log-distribution of residuals, probit assumes a normal distribution. Heteroskedastic probit models can account for non-constant error variances –> Check for heteroskedasticity?

Multiple Treatments

The multinomial probit model is the preferable option compared to logit. Alternatively, just run several binary ones (more complicated but also more robust to errors).

Variable selection

- outcome variable must be independent of treatment conditional on the pscore (CIA)
- Only variables that influence simultaneously the participation decision and the outcome variable should be included (based on theory and empirical findings)
- variables should either be fixed over time or measured before participation (include only variables unaffeted by participation)

- choice of variables should be based on economic theory and previous empirical findings

Tests for variable selection

Strategies for the selection of variables to be used in estimating the propensity score:

3 Data and Descriptive Analysis

Our analysis is based on observational firm-level data. The dataset comprises 11,323 firms, of which 4,460 received FDI in 2016. The FDIs are categorized into three different types: Exports-oriented, technology intensive and domestic market seeking FDI. The outcome variable TFP was measured in 2017. The baseline variables were measured in 2015 (one year prior to receiving FDI) and comprise information on:

- Ownership (listed company, subsidiary, independent or state owned)
- Technology intensity (low, medium low, medium high or high-tech industries)
- Access to a port
- Wages (as log variable)
- Total Factor Productivity (TFP)
- Firm size (measured in number of employees, log variable)
- Debt (as log variable)
- Export intensity
- Whether the firm has invested in Research and Design

Table 1: Difference in Pre-Treatment Covariate Means

	(1) Control	(2) Treatment	T-test Difference (1)-(2)
Technology intensity	2.565	1.838	0.728***
	(0.014)	(0.015)	
Access to port	0.273	0.467	-0.194***
	(0.005)	(0.007)	
Log wages	7.529	7.031	0.498***
	(0.046)	(0.057)	
TFP	3.185	2.821	0.364***
	(0.025)	(0.030)	
Log employment	3.766	5.405	-1.639***
	(0.037)	(0.041)	
Log debts	0.511	0.493	0.019***
	(0.004)	(0.005)	
Export intensity	0.131	0.204	-0.073***
	(0.001)	(0.001)	
R&D dummy	0.117	0.128	-0.012*
	(0.004)	(0.005)	
Observations	6863	4460	

Notes: Columns (1) and (2) show the pre-treatment covariate means of the control and treatment group respectively. Standard errors are displayed in paratheses. The values displayed for t-tests are the differences in the means across the groups. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

Table 2: Impact of FDI on TFP

VARIABLES	NN1 ATE	NN1 ATT	NN5 ATE	NN5 ATT	IWP ATE	IPW ATT	AIWP ATE
r1vs0.FDI2016	0.257***	0.302***	0.246***	0.273***	0.245***	0.367***	0.292***
	(0.038)	(0.040)	(0.028)	(0.022)	(0.013)	(0.013)	(0.006)
0.FDI2016							
P0 Means					3.510***	3.247***	
					(0.020)	(0.033)	
Observations	11,323	11,321	11,321	11,323	11,323	11,323	11,323

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

4 Empirical Specification

4.1 Effect of FDI on TFP

5 Results

6 Discussion/Conclusion

For citation:
you have to add your reference firstly in bibCG. After having done so you can always include the reference in the actual file as follows:
?
(**?**, p. 35)

Thoughts on what we could write for discussion/limits of our study:

1. Do not know much about the context of the treatment (so cannot really rule out anticipation-effects?)
2. Would have been interesting to extend the study to several years after the treatment. Do effects persist? Do they vanish?

Appendix