

APPLIED MICROECONOMETRICS - ECON 4008

GROUP PROJECT A

The Effect of FDI on Firm Productivity -A Propensity Score Estimation Approach

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1. Introduction

The understanding of potential effects of Foreign Direct Investment (FDI) on a firm's productivity is of major concern to policy makers. FDI is commonly associated with higher firm productivity (Girma and Görg, 2007). Recent literature trying to identify the causal mechanisms underlying this correlation has stressed the difficulties to pin down the size and direction of the relationship. Most argue that foreign investment positively impacts firm productivity. However, it is also possible that foreign investors choose more productive firms (Arnold and Javorcik, 2009).

The identification of the causal effect of FDI on a firm's performance, and in particular on its total-factor productivity (TFP) requires the counterfactual outcome. Although it is inherently unobservable, different methods can be used to take into account the biases stemming from this missing data problem, e.g. randomization, Difference-in-Differences (DiD), as well as Instrumental Variable and Propensity Score methods (Karpaty, 2007). A common method in the economic literature regarding the effects of FDI combines DiD with Propensity Score-based estimation. The latter is used in order to compare treated to untreated firms which are similar in their likelihood of receiving treatment, given a set of observable pre-treatment characteristics. DiD estimation on the other hand accounts for unobservable firm characteristics that are constant over time. Estimations combining both methods are expected to provide a robust Average Treatment Effect (ATE).

This methodology is used by Arnold and Javorcik (2009); Karpaty (2007); Girma and Görg (2007) and Schiffbauer et al. (2017). Arnold and Javorcik (2009) find a positive and persistent effect of FDI on firm productivity, estimating a 13.5% increase in productivity of treated firms after three years. Karpaty (2007) finds a positive effect of foreign acquisitions on productivity of Swedish manufacturing plants, ranging between 7 and 8 percent for the DiD estimators. However, it took up to five years for productivity differences to occur. Girma and Görg (2007) use plant-level data from the UK's electronics and food industries and find substantial heterogeneity across industries, especially with respect to the onset of positive effects on TFP growth. Koch and Smolka (2019) combine DiD with Inverse Propensity Score Weighting (IPW). They use Spanish firm level data, providing evidence of an increase in output of ten percent, which is explained almost entirely through skill upgrading caused by foreign acquisition.

Using various propensity score estimators, we investigate the effect of FDI on TFP for a sample of 11,323 firms. In line with previous research, we identify a statistically and economically significant effect of FDI on firm productivity, with an ATE between 12 and 15 percent of a standard deviation. This result is robust to various model specifications,

although there seems to be some heterogeneity of the effect across different levels of technology intensity. We also examine the effects of the specific types of FDI, but find no evidence of differences in their impact on firm productivity.

The remainder of this paper is organized as follows: The data and empirical specification are presented in sections 2 and 3, respectively. The results and robustness checks are shown in section 4. Section 5 concludes.

2. Data and Descriptive Analysis

Our analysis is based on observational firm-level data from 2015 to 2017. The dataset comprises 11,323 firms, of which 4,460 received FDI in 2016. FDI can be divided into three subcategories. Table 1 shows the frequencies of each type of FDI in our sample. Among the recipients of FDI, most firms (1,965) received domestic market seeking FDI. 1,555 firms received technology intensive FDI and the remaining 640 firms received exports oriented FDI. The outcome variable TFP was measured in 2017, the year after treatment. We standardize TFP to a mean of zero and a standard deviation of one, making the interpretation more intuitive.

Table 1: Frequency of FDI Types

FDI type	Abs. Freq.	Rel. Freq.
No FDI		61%
Exports oriented FDI	$6,\!863$ 940	8%
Technology intensive FDI	$1,\!555$	14%
Domestic market seeking FDI	$1,\!965$	17%
Total	$11,\!323$	100%

A set of categorical and continuous control variables was measured in 2015, one year prior to the firms receiving FDI. Table 2 provides an overview of the categorical variables and their frequencies in our sample. The port variable indicates whether a firm has access to a port within 500km. The legal ownership of a firm is captured in the ownership variable. The technology intensity of the industry the respective firm is operating in, is measured in four categories from low- to high-tech. The R&D dummy indicates whether a firm has invested in Research and Development in 2015.

Table 2: Summary Statistics of Categorical Covariates

	Abs. Freq.	Rel. Freq.
$\mathbf{Port}^{\mathrm{a}}$		
No	7,366	65.05
Yes	$3,\!957$	34.95
Ownership		
Listed company	909	8.03
Subsidiary	2,630	23.23
${ m Independent}$	$4,\!593$	40.56
State owned	$3,\!191$	28.18
Technology Intensity		
Low-tech	4,194	37.04
Medium low-tech	1,685	14.88
Medium high-tech	$3,\!539$	31.25
${ m High\text{-}tech}$	$1,\!905$	16.82
$\mathbf{R\&D^b}$		
No	$9,\!951$	87.88
Yes	1,372	12.12

^a Indicates whether a firm has access to a port within 500km.
^b Indicates whether a firm has invested in R&D in 2015.

Table 3: Summary Statistics of Continuous Covariates

	Mean	Median	Sd	Min	Max
Wages	$1,967^{a}$	1,538	$50,990^{a}$	0.00065	$5,519,000^{\mathrm{a}}$
TFP	3.041	3.032	2.047	-5.359	11.36
Employment	$7,\!111$	81.39	$117,\!155$	0.00197	$8,\!824^{\rm a}$
Debt	1.762	1.649	0.634	0.819	3.668
Export intensity	0.159	0.154	0.0798	0.0103	0.483

Note: All variables in levels.

^a In Thousands

The summary statistics of the continuous variables, i.e. wages, total-factor productivity (TFP), firm size¹, debts and the firms' export intensity are displayed in Table 3. The variables wages and employment and, to a lesser extent, debts show large differences between their mean and median values. To reduce the influence of extreme values potentially causing this divergence one can take the logarithm of these variables. However, including the log transformed employment variable yields worse covariate balance in all estimated models. We therefore include the untransformed employment variable in the subsequent analysis, despite noting at least one extreme value in this variable (see Figure 1). We test the robustness of our models to the exclusion of observations with extreme values in the employment variable in section 4.

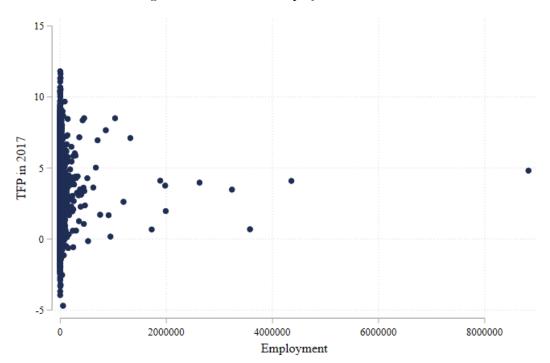


Figure 1: Outliers in Employment Variable

¹Since the original variable is only available in logarithmic form and lacks an indicator for the unit of measurement we assume it is measured in number of employees.

To further motivate the use of propensity scores in estimating the effect of FDI on a firm's TFP, we show the differences in means between firms that received FDI and firms that did not in Table 4. The t-tests show significant differences in all observable characteristics, suggesting that there might be selection into treatment.

Table 4: 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***
1	(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.

3. Empirical Specification

If FDI was not randomly assigned to firms, a simple comparison of treated and untreated firm outcomes would yield a biased treatment effect. Instead, we use propensity score estimation to compare the outcomes of similar firms. For this purpose we estimate the likelihood of treatment for each firm, i.e. the propensity score. It is based on a set of observable characteristics that influence both the outcome and the likelihood of treatment.

We assume that conditional on these confounders, the treatment is independent of the potential outcome, i.e. the Conditional Independence Assumption (CIA) is satisfied.

Our propensity score is estimated via a logit regression of the binary treatment variable on ownership, technology intensity, a Research&Development dummy, the logarithm of wages, TFP, employment and debts in 2015. We use the same specification of covariates for all estimators, unless stated otherwise. We do not include the export variable as a matching covariate, assuming that exports do not increase firm productivity. Only covariates that influence the likelihood of treatment and the outcome of interest need to be included (?). Although there is some debate about the direction of causality between exports and productivity, Wagner (2007) argues in his literature review that productivity increases exports, but not the other way around. The exclusion of the export variable significantly improves covariate balance. We do not include the port variable for the same reason. Figure 2 shows evidence of sufficient propensity score overlap for a matching analysis. The covariate balances of the different models is discussed in more detail below.

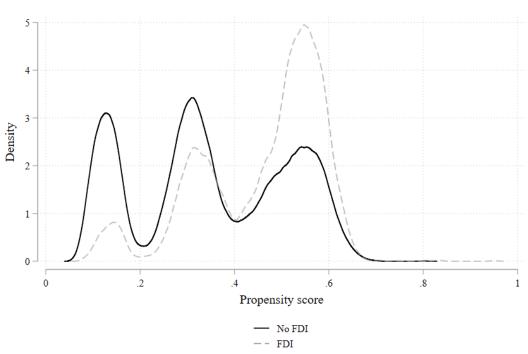


Figure 2: Propensity Score Overlap in Main Model

The first two models are estimated using the nearest-neighbour matching with replacement. The outcomes of treated observations are compared to those of the closest control observations in terms of propensity scores. We estimate these models with one and five nearest neighbours, respectively. For the latter we add a caliper cutoff at 0.05. We also fit inverse probability weighting models (IPW), which weigh observations by the inverse probability of being in their observed treatment group. Further, we estimate the treatment effect using the augmented inverse probability weighting model (AIPW), which adds covariate adjustment to the weighting. Thus, as long as either the propensity score or the covariate adjustment model is correctly specified, the results of the AIPW are unbiased (Imbens and Rubin, 2015, p. 393). The point of using multiple estimators is to ensure that the investigated effect is robust to the use of different estimation methods.

4. Results

4.1. Effect of FDI on TFP

The main findings of this paper are displayed in Table 5. It reports the Average Treatment Effects of FDI on TFP. Across different estimators we find large and highly significant coefficients, indicating that receiving FDI increases TFP of companies on average. The reported coefficients differ only slightly in magnitude.

Table 5: ATE of FDI on TFP

	NN1	NN5	IPW	AIPW
	(1)	(2)	(3)	(4)
FDI2016	0.130***	0.114***	0.122***	0.142***
	(0.015)	(0.011)	(0.007)	(0.003)
PO Means			-0.068***	-0.057***
			(0.010)	(0.009)
Observations	11,323	11,318	11,323	11,323

Note: This table reports the standardized coefficients of several matching estimators. All matching was done with replacement. Columns (1) and (2) show the coefficients of the one and five nearest neighbour propensity score matching respectively. For the NN5 matching, a caliper was set to .05. Columns (3) and (4) display the coefficients of the inverse probability and augmented inverse probability matching estimators respectively. The covariate adjustment model specification is the same as that of the propensity score model. Standard errors are displayed in parentheses. ***, ***, and * indicate significance at the 1, 5, and 10 percent critical level.

Column (1) shows the results of a one-to-one propensity score matching with replacement. Had all firms in our sample received FDI, the TFP would have increased by 13 percent of a standard deviation on average. Slightly lower results are obtained from a propensity score matching with five nearest neighbors and a caliper of 0.05 in column (2). The caliper cutoff excluded five observations. The estimate of the IPW in column (3) is also somewhat below that of column (1). The estimate of the doubly robust AIPW-estimator is slightly larger than that of the first model, but all estimates differ by no more than 3 percent of a standard deviation.

Checking the covariate balances of our models, the standardized differences and variance ratios are within a very good range for all models. We prefer the one-to-one propensity score matching as it gives us the best covariate balance of all the estimators. The maximum standardized difference among all covariates is four percent and the largest variance ratio is 1.7, with all others being close to one (see A.2).

4.2. Robustness of Results

Alternative Specifications

In order to test for the sensitivity of our main findings to alternative model specifications, we perform several robustness checks for the nearest-neighbour matching estimator with one neighbour. The results are reported in Table 6. The positive and significant effect of FDI on TFP persists through all specifications, confirming our main results that foreign investment increases the productivity of domestic firms. In column (1), we add interaction terms of the dummy variables with the continuous regressors to our set of covariates. This is widely practiced to improve covariate balance (Caliendo and Kopeinig, 2008). However, in our case we do not find notable improvements but worse balances for some covariates. In fact, the covariate balance of the included interaction terms was not within an acceptable range.² The estimated ATE of FDI on productivity slightly increases by 0.022 standard deviations compared to the effect reported in column (1) of Table 5.

²The same holds true when interacting only dummy variables, only continuous variables or all variables.

Table 6: Robustness of Results

	$\begin{array}{c} \text{Including} \\ \text{Interactions} \\ (1) \end{array}$	Excluding Outliers (2)	Including Port (3)	Effect on the Treated (4)
ATE	0.152*** (0.016)	0.127*** (0.015)	0.125*** (0.019)	
ATT				0.127*** (0.017)
Observations	11,323	11,321	11,323	11,323

Note: All specifications are variations of our main model using the Propensity Score Matching method with one nearest neighbour and replacement. Covariates in the main model included: Ownership, Technology Intensity, Research&Development, logarithm of Wages, Total Factor Productivity, Employment and Debts. In column (1), the main model is augmented by interactions of the dummy variables (Ownership, Technology Intensity, Research & Development) with continuous variables (Logarithm of wages, Total Factor Productivity, Employment and Debts). The specification in column (2) excludes two observations with values of Employment 2015 above four million. In column (3) we include a dummy variable indicating whether a port lies within 500km of the firm as an additional covariate. Column (4) reports the average treatment effect on the treated. Standard errors are displayed in parentheses. ***, ***, and * indicate significance at the 1, 5, and 10 percent critical level.

As we decided not to log transform the employment variable, our results could further be biased by its outliers (see Figure 1). While most of the firms' employee numbers are concentrated around the mean of 7,111, we are concerned about two observations with extreme values, with eight and four million employees respectively. To check whether these outliers influence our main findings, we restrict the sample to firms with less than four million employees. The results reported in column (2) show no significant change in the treatment effect when excluding the two extreme observations.

We have also assumed that the presence of a port within 500 km of the firm does not influence productivity. Although one could argue that having access to a port might increase productivity e.g. by facilitating market access, we find no evidence of this. Column (3) reports only a small change in the estimate of 0.5 percent of a standard deviation when including the port dummy in our set of covariates.

Column (4) reports the Average Treatment Effect on the Treated (ATT) of the propensity score matching with one neighbor and replacement. While the ATE measures the average effect of FDI for the hypothetical case that all firms received FDI, the ATT estimates the effect only on those firms that actually received treatment. Because selection into treatment is non-random, we might find different effects of treatment on

the treated. It could, for example, be higher if those firms receiving treatment are also the ones benefiting more from it in terms of productivity. However, our estimate in column (4) reports an ATT that is very similar to the average treatment effect. This suggests that although there was selection into treatment, our propensity score model yields similar results as under randomization, where ATE and ATT are equal.

Effects by Technology Intensity

FDI flows vary strongly between different sectors (see, for example, Javorcik (2004); Keller and Yeaple (2009); Haskel et al. (2007)). In our sample, firms are divided into four industry groups, ranging from low-tech to high-tech industries. While foreign investors target only 13 percent of firms in high-tech industries, more than half of the firms in low-tech industries have received FDI in 2016.³ Empirical evidence suggests that the effect of FDI on firm productivity is heterogeneous, depending on a firm's technology intensity. For instance, Keller and Yeaple (2009) find a strong effect of FDI on the productivity of domestically owned firms in the high-tech sector but only a very small, if any, effect on low-tech industries. To test for this possibility, we estimate the ATE of FDI on productivity separately for each industry and report the results in Table 7. Standard errors have increased slightly, but the results are still highly significant.

Table 7: ATE by Technology Intensity of Industry

	J.	0./	J	J
		Medium	Medium	
	Low-Tech	Low-Tech	High-Tech	High-Tech
	${\rm Industry}$	$\operatorname{Industry}$	$\operatorname{Industry}$	$\operatorname{Industry}$
	(1)	(2)	(3)	(4)
FDI2016	0.160***	0.086***	0.172***	0.180***
	(0.020)	(0.028)	(0.019)	(0.054)
Observations	4,194	1,685	3,539	1,905

Note: The table reports the standardized ATE coefficients for subsamples of firms with different levels of technology intensitiy. Standard errors are displayed in paratheses. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

The impact of FDI does indeed vary across industries. Our estimates support the finding of Keller and Yeaple (2009) that firms in high-tech industries benefit the most, as FDI increases productivity of these firms by 18 percent of a standard deviation, five

³See Appendix A.1.

percentage points more than our results for the full sample would suggest. Somewhat surprising is that the estimates for the low-tech industry are also higher than in our main specification. The medium low-tech industry, instead, benefits much less than the other industries. It experiences an increase in TFP of only 8.6 percent of a standard deviation when receiving FDI.

The weighted average of these estimates yields an ATE of FDI on TFP of 0.158 standard deviations.⁴ This effect slightly differs from our main result due to the fact that matching is now performed within industry only. Although matched neighbours might be more 'distant' regarding other covariate values, we can ensure that each treated firm is allocated to a control observation with the same technology intensity. Despite the smaller sample sizes, the covariate balances remain good overall.

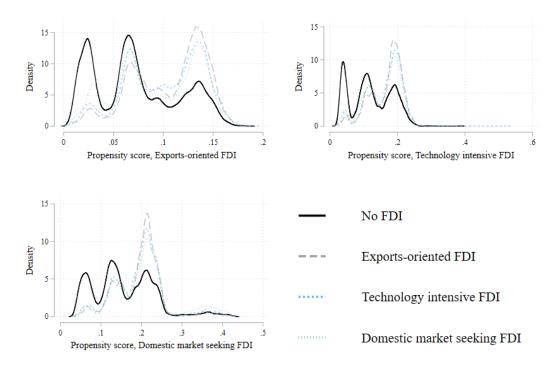
4.3. Analysis by Type of FDI

We continue our analysis by looking at potential heterogeneity of the treatment effect across types of FDI. We test the possibility that one specific type of investment single handedly drives our previous results. It is possible that, for example, only exports-oriented FDI increases factor productivity while the other two types have little or no impact. This would violate the Stable Unit Treatment Value Assumption (SUTVA), necessary for causal effect stability.

We estimate an augmented IPW model with multi-valued treatment effects. The proposensity score and regression adjustment model specifications are the same as that of our main mdoel. The model yields good covariate balance (see A.2). We further estimate an IPW model to check if it returns similar estimates without regression adjustment. The covariate balance in this model is practically the same. Finally, we specify a set of AIPW models, each comparing only one type of treatment to non-treated observations. This allows for the IIA assumption to be relaxed which is required for mulitnomial logit models. The separate models have worse covariate balance than the multinomial ones but are still acceptable. The overlap assumption is satisfied for all treatment levels as can be seen in Figure 3.

⁴Weights are allocated according to relative subsample size.

Figure 3: Propensity Score by Treatment Level



In Table 8 the results from the type-wise analysis are shown. In the AIPW multinomial specification, the ATE of different types of FDI are within half a percent of each other. This suggests that all types of FDI increase factor productivity by the same margin. The estimated effect size is close to the one estimated for FDI in Table 5. In the IPW specification the differences are slightly larger but still within five percent of a standard deviation of each other. The separate logit models also yield essentially the same effect sizes as the multinomial specification. Since the AIPW estimator is doubly robust, assuming correctly specified covariate adjustment models, the results in columns (1) and (3) provide us with strong evidence of homogenous effects of different FDI Types on TFP.

Table 8: ATE by Type of FDI

	(1)	(2)	(3)	(4)	(5)
	AIPW	IPW	AIPW	AIPW	$\overline{\mathrm{AIPW}}$
	Mlogit	Mlogit	Logit	Logit	Logit
Exports-oriented FDI	0.144*** (0.006)	0.157*** (0.032)	0.140*** (0.007)		
Technology intensive FDI	$0.139*** \\ (0.005)$	0.112*** (0.018)		0.139*** (0.005)	
Domestic market seeking FDI	0.143*** (0.004)	0.134*** (0.011)			0.143*** (0.004)
PO Means	-0.057*** (0.009)	-0.068*** (0.010)	-0.012 (0.011)	-0.025** (0.011)	-0.017 (0.011)
Observations	11,323	11,323	7,803	8,418	8,828

Note: Columns (1) and (2) report the coefficients of the multinominal augmented inverse probability and multinominal inverse probability matching estimators respectively. Columns (3)-(5) display the results of the augmented inverse probability matching estimator for subsamples of firms having received different types of FDI. Standard errors are displayed in paratheses. ***, **, and * indicate significance at the 1, 5, and 10 percent critical level.

5. Conclusion

Using Propensity Score-based estimators, we find a positive, economically and statistically significant effect of FDI on firm productivity. This effect is robust across various estimators as well as to different model specifications. We find evidence of heterogeneity across technology levels, however, this effect is not linearly increasing with technology intensity. The treatment effect is essentially the same for all types of FDI.

While our findings are broadly in line with the empirical literature, our ability to contextualize our results is limited by the lack of information about our data. For example, our dataset does not provide the geographical location of firms. The effect of FDI on TFP might be different in developed and less developed countries. Moreover, we lack a detailed industry classification of firms. We are thus unable to account for spillover effects on nearby firms or on firms within the same industries. This may lead to an underestimation of the ATE.

A DiD-Matching combination would have further allowed us to control for unobservable firm characteristics, however, this would exceed the scope of our analysis. Finally,

as mentioned in the literature review, the effects of FDI can change over time. We can only report estimates of the initial impact of FDI on TFP in the year after treatment. Thus we cannot make any claims about the persistence of the effect.

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A. Appendix

A.1. Treatment by Technology Intensity

		Control G:	roup	Т	reatment (Group
	(1)	(2)	(3)	(4)	(5)	(6)
	Abs.	Rel.(%)	$\operatorname{Cum}_{\cdot}(\%)$	Abs.	Rel.(%)	$\operatorname{Cum}_{\cdot}(\%)$
Technology Intensity						
Low-tech	1869	44.6	27.2	2325	55.4	52.1
Medium low-tech	904	53.6	40.4	781	46.4	69.6
Medium high-tech	2432	68.7	75.8	1107	31.3	94.5
High-tech	1658	87.0	100.0	247	13.0	100.0
Total	6863	60.6		4460	39.4	

Note: This table reports firm technology intensity by treatment status. The first three columns respectively display the absolute and relative frequencies, as well as the cumulative within-group relative frequencies for the control group. The same parameters are reported in columns (4)-(6) for the group of firms that received FDI in 2016.

A.2. Stata Output

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```
name: <unnamed>
log: C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometri
cs\fdimatching deleteEXP/log_fdi_matching.smcl
log type: smcl
opened on: 10 May 2020, 20:53:51
           clear all
package gr0070 from http://www.stata-journal.com/software/sj17-3
cap ssc install gr0070
9 .
10. //
11.
            package outreg2
cap ssc install outreg2
12.
13. //
14.
           package tabout cap ssc install tabout
21.
           global scripts "$root/02_scripts"
           global log "$root/03 log"
22.
           global results "$root/04_results"
23.
           use "$input/FDI_project"
26.
27.
28. *---
label var OWN "Ownership"
32.
33.
           label var TECH "Technology intensity"
           label var PORT "Access to port"
34.
           label var logwages2015 "Log wages"
35.
            label var TFP2015 "TFP"
37
           label var logemp2015 "Log employment"
           label var DEBTS2015 "Log debts"
```

```
label var EXP2015 "Export intensity"
39.
       label var RD2015 "R&D dummy"
       label var logwages2017 "Log wages"
41.
       label var TFP2017 "TFP"
42.
43.
44. *-----
45. * PART 1.3: Transforming variables
46. *------
47.
48.
       generate TFPS17= (TFP2017-3.656046)/2.056464
49.
       generate emp2015= exp(logemp2015)
50.
       generate wages15 = exp(logwages2015)
51.
       generate debts15 = exp(DEBTS2015)
53. save $input/fdi_matching_clean, replace file C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdima > tching_deleteEXP/01_input/fdi_matching_clean.dta saved
58.
       global F "OWN TECH RD2015"
60.
       global C "logwages2015 TFP2015 emp2015 DEBTS2015"
61.
65.
66.
             do $scripts/02_Descriptive_Analysis
Applied Microeconometrics
                            Empirical Project
                                     Do-File 02
                       Analysis of Dataset
                       PART 1: Overview
PART 2: Summary Statistics
PART 3: Balance Tables
             OUTLINE:
```

68. 69. describe

Contains data from C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microecon > ometrics\fdimatching_deleteEXP/01_input/fdi_matching_clean.dta obs: 11,323 vars: 21 10 May 2020 20:54 size: 713,349

storage type	display format	value label	variable label
float	%9.0q		firm identifier
byte	%9.0g		FDI/TREATMENT dummy in 2016
		FDITYPE	FDI type
		OWN	Ownership
			Technology intensity
			Access to port
			Log wages
			TFP
			Log employment
			Log debts
			Export intensity
			R&D dummy
			Log wages
			TFP
			log employment in 2017
			EXPORT INTENSITY in 2017
			R&D dummy in 2017
			Nub dummy III 201/
	float byte byte byte byte byte float float float float byte	float %9.0g byte %28.0g byte %28.0g byte %27.0g byte %27.0g float %9.0g	type format label float %9.0g byte %9.0g byte %28.0g FDITYPE byte %17.0g OWN byte %27.0g TECH byte %21.0g PORT float %9.0g

Sorted by: FDI2016

Frequencies of FDI types tab FDITYPE2016

Cum.	Percent	Freq.	FDI type
60.61 68.91 82.65 100.00	60.61 8.30 13.73 17.35	6,863 940 1,555 1,965	No FDI Exports-oriented FDI Technology intensive FDI Domestic market seeking FDI
	100.00	11.323	Total

```
73.
74. *---
75. *
76. *---
77.
78.
                PART 1.1: Correlations matrix
                         FDI2016 ///
OWN TECH PORT ///
logwages2015 TFP2015 emp2015 DEBTS2015 EXP2015 RD2015
                corr
   (obs=11,323)
```

	FDI2016	OWN	TECH	PORT	logwag~5	TFP2015
FDI2016 OWN TECH PORT logwages2015 TFP2015 emp2015 DEBTS2015	1.0000 0.1026 -0.3144 0.1984 -0.0633 -0.0868 0.0249 -0.0259	1.0000 -0.1797 0.0564 -0.0566 -0.0457 -0.0025 0.2636	1.0000 -0.4172 0.1843 0.1080 -0.0353 -0.0064	1.0000 -0.0694 0.0620 0.0319 0.0019	1.0000 0.0351 -0.0062 -0.0327	1.0000 -0.0035 -0.0423
EXP2015 RD2015	0.4480 0.0175	-0.1249 0.0070	0.3125 0.0093	0.2780 -0.0088	0.0453 0.0100	0.0409 0.0419

		emp2	015 DEB~2015	EXP2015	RD2015	
_	emp201 DEBTS201 EXP201 RD201	5 -0.00	026 1.0000 220 0.0668	1.0000	1.0000	
82.	* ******* // Co on sn ke	******* ontinuous utreg2 us um(detail eep(wages	************ variables ing "\$results) TFP2015 de ep(mean p50 s	s/02_Descr:	PART 2: S ******* iptive_An	Summary States ************************************
_	Percei	ntiles	Smallest	ет		
1 5 10 25	00 00 00	124 623 1245 3101	1 2 4 6	Obs Sum o	of Wgt.	11,323 11,323
50		6186	Largest	Mean Std.	Dev.	6181.449 3558.895
75 90 95 99	90	9252 11111 11735 12212	12330 12331 12332 12333	Varia Skewn Kurto	ness	1.27e+07 0042869 1.80306
_		FDI	/TREATMENT du	ummy in 201	16	
1 5 10 25	op op op	ntiles 0 0 0 0	Smallest 0 0 0 0	Obs Sum o	of Wgt.	11,323 11,323
50	&	0	Largest	Mean Std.	Dev	.3938885 .4886322
75 90 95 99	90	1 1 1 1	1 1 1 1	Varia Skewn Kurto	ance ness	.2387614 .4343395 1.188651
_			FDI typ	oe		
1 5 10 25	90 90 90	ntiles 0 0 0 0	Smallest 0 0 0 0	Obs Sum o	of Wgt.	11,323 11,323
50	8	0	Largest	Mean Std.		.8783008 1.192862
75 90 95 99	90 90	2 3 3 3	3 3 3 3	Varia Skewn Kurto	ance ness	1.42292 .8489698 2.022788

		Ownership		
1% 5% 10%	Percentiles 1 1 2	Smallest 1 1 1	Obs	11,323
25%	2	1	Sum of Wgt.	11,323
50%	3	Largest	Mean Std. Dev.	2.888987 .9071667
75% 90% 95% 99%	4 4 4 4	4 4 4 4	Variance Skewness Kurtosis	.8229515 4250337 2.357997
		Technology inte	nsity	
1% 5% 10% 25%	Percentiles 1 1 1 1	Smallest 1 1 1 1	Obs Sum of Wgt.	11,323 11,323
50%	2	Largest	Mean Std. Dev.	2.278636 1.130658
75% 90% 95% 99%	3 4 4 4	4 4 4 4	Variance Skewness Kurtosis	1.278387 .1369556 1.562267
		Access to po	rt	
1% 5% 10% 25%	Percentiles 0 0 0 0	Smallest 0 0 0 0	Obs Sum of Wgt.	11,323 11,323
50% 75%	0	Largest 1	Mean Std. Dev.	.3494657 .4768223
90% 95% 99%	1 1 1 1	1 1 1	Variance Skewness Kurtosis	.2273595 .6314342 1.398709
		Log wages		
1% 5% 10% 25%	Percentiles -1.638978 1.059369 2.408368 4.74146	Smallest -7.331795 -7.103724 -5.701573 -5.625238	Obs Sum of Wgt.	11,323 11,323
50%	7.338148	Largest	Mean Std. Dev.	7.332918 3.838861
75% 90% 95% 99%	9.902966 12.20624 13.65446 16.26827	20.87844 20.99824 21.31597 22.43151	Variance Skewness Kurtosis	14.73685 .0050248 3.044124
		TFP		
1% 5% 10% 25%	Percentiles -1.760341 3396301 .4065464 1.69375	Smallest -5.359266 -4.564884 -3.947462 -3.887785	Obs Sum of Wgt.	11,323 11,323

50%	3.032239	Largest	Mean Std. Dev.	3.041338 2.046604
75% 90% 95% 99%	4.417369 5.679015 6.381904 7.791977	10.39066 10.79894 10.82878 11.35702	Variance Skewness Kurtosis	4.188589 0117873 3.028324
		Log employmer	nt	
1% 5% 10% 25%	Percentiles -2.6342895589151 .5075461 2.341855	Smallest -6.228763 -6.20012 -6.185894 -6.092359	Obs Sum of Wgt.	11,323 11,323
50%	4.399255	Largest	Mean Std. Dev.	4.411473 3.040198
75% 90% 95% 99%	6.524904 8.279512 9.413677 11.393	14.9902 15.08997 15.28719 15.99303	Variance Skewness Kurtosis	9.242801 0080799 2.960453
		Log debts		
1% 5% 10% 25%	Percentiles 1750222 0806167 .029059 .2368089	Smallest199846419973921994081993328	Obs Sum of Wgt.	11,323 11,323
50%	.5004624	Tananah	Mean	.5040355
75% 90% 95% 99%	.7537385 .9722362 1.122765 1.254863	Largest 1.2992 1.29932 1.299587 1.299778	Std. Dev. Variance Skewness Kurtosis	.3525262 .1242747 .0806031 2.316729
		Export intensi	ity	
1% 5% 10% 25%	Percentiles .0190834 .0384401 .0575267 .0990072	Smallest .0103205 .0104334 .0104726 .0105073	Obs Sum of Wgt.	11,323 11,323
50%	.1543709	Largest	Mean Std. Dev.	.1593435 .0798147
75% 90% 95% 99%	.2130122 .2652063 .2949337 .3648675	.4667603 .4720742 .4777972 .4831533	Variance Skewness Kurtosis	.0063704 .4171633 2.827241
		R&D dummy		
1% 5% 10% 25%	Percentiles 0 0 0 0 0	Smallest 0 0 0 0	Obs Sum of Wgt.	11,323 11,323
50%	0	Largest	Mean Std. Dev.	.1211693 .3263383
75% 90% 95% 99%	0 1 1	1 1 1 1	Variance Skewness Kurtosis	.1064967 2.321808 6.390791

	Log wages			
1% 5% 10% 25%	Percentiles -2.120156 0123446 1.035314 2.910137	Smallest -6.185148 -6.022474 -5.493109 -5.369166	Obs Sum of Wgt.	11,323 11,323
50% 75% 90% 95% 99%	4.989117 7.136983 8.938831 10.04671 12.01537	Largest 15.41822 15.76589 16.21945 17.04211	Mean Std. Dev. Variance Skewness Kurtosis	5.010195 3.082818 9.503766 0073109 2.956235
		TFP		
1% 5% 10% 25%	Percentiles -1.170003 .2511905 1.018264 2.283582	Smallest -4.700881 -3.951226 -3.692741 -3.331597	Obs Sum of Wgt.	11,323 11,323
50%	3.664006	Largest	Mean Std. Dev.	3.656046 2.056464
75% 90% 95% 99%	5.041636 6.310671 7.028272 8.400249	11.30793 11.34453 11.62984 11.8114	Variance Skewness Kurtosis	4.229043 016582 3.017121
		log employment i	in 2017	
1% 5% 10% 25%	Percentiles -2.170581018102 1.038013 2.929524	Smallest -6.217651 -6.184767 -5.748356 -5.622331	Obs Sum of Wgt.	11,323 11,323
50%	5.0262	Largest	Mean Std. Dev.	5.030484 3.094736
75% 90% 95% 99%	7.173199 8.980158 10.10212 12.07887	15.48663 15.49919 15.74725 16.38825	Variance Skewness Kurtosis	9.57739 024026 2.950697
	1	EXPORT INTENSITY	in 2017	
1% 5% 10% 25%	Percentiles .0581937 .1113043 .1423226 .19367	Smallest .0187976 .0211925 .0216743 .0221602	Obs Sum of Wgt.	11,323 11,323
50%	.2606816	Largest	Mean Std. Dev.	.2696827 .1083555
75% 90% 95% 99%	.3300854 .4089049 .4650209 .5815625	.7790653 .7935594 .8165495 .9501169	Variance Skewness Kurtosis	.0117409 .6997986 4.15865
		R&D dummy in 2	2017	
1% 5% 10% 25%	Percentiles 0 0 0 0	Smallest 0 0 0 0 0	Obs Sum of Wgt.	11,323 11,323

50%	0	Largest	Mean Std. Dev.	.4074009 .4913723
75% 90% 95% 99%	1 1 1	1 1 1 1	Variance Skewness Kurtosis	.2414467 .3769168 1.142066
		TFPS17		
1% 5% 10% 25%	Percentiles -2.34677 -1.655684 -1.28267866739	Smallest -4.063736 -3.6992 -3.573506 -3.397892	Obs Sum of Wgt.	11,323 11,323
50% 75% 90% 95%	.0038706 .6737731 1.290869 1.639817	Largest 3.720892 3.738692 3.87743	Mean Std. Dev. Variance Skewness	1.64e-07 .9999998 .9999996 016582
99%	2.306971	3.965719	Kurtosis	3.017121
		emp2015		
1% 5% 10% 25%	Percentiles .07177 .5718291 1.66121 10.40051	Smallest .0019719 .0020292 .0020583 .0022601	Obs Sum of Wgt.	11,323 11,323
50%	81.39024	Tammaat	Mean Std. Dev.	7111.033 117154.6
75% 90% 95% 99%	681.9145 3942.272 12254.85 88698.71	Largest 3237150 3576776 4356531 8824411	Variance Skewness Kurtosis	1.37e+10 49.56077 3179.901
		wages15		
1% 5% 10% 25%	Percentiles .1941784 2.884551 11.1158 114.6014	Smallest .0006544 .000822 .0033407 .0036057	Obs Sum of Wgt.	11,323 11,323
50%	1537.861	Largest	Mean Std. Dev.	1966556 5.99e+07
75% 90% 95% 99%	19989.56 200032.7 851244.9 1.16e+07	1.17e+09 1.32e+09 1.81e+09 5.52e+09	Variance Skewness Kurtosis	3.59e+15 73.88568 6472.332
		debts15		
1% 5% 10% 25%	Percentiles .8394383 .9225472 1.029485 1.267199	Smallest .8188565 .8189443 .8192155 .8192772	Obs Sum of Wgt.	11,323 11,323
50%	1.649484	Largest	Mean Std. Dev.	1.76176 .6339302
75% 90% 95% 99%	2.124929 2.64385 3.073339 3.507359	3.666363 3.666803 3.667783 3.668482	Variance Skewness Kurtosis	.4018675 .7983175 3.165366

87. 88. // 89. Categorical variables tab PORT

Access to port	Freq.	Percent	Cum.
No ports within 500km Ports within 500km	7,366 3,957	65.05 34.95	65.05 100.00
Total	11,323	100.00	

90. tab OWN

	Ownership	Freq.	Percent	Cum.
_	Listed companies Subsidiaries Independent State	909 2,630 4,593 3,191	8.03 23.23 40.56 28.18	8.03 31.25 71.82 100.00
_	Total	11,323	100.00	

91. tab TECH

Cum.	Percent	Freq.	Technology intensity
37.04 51.92 83.18 100.00	37.04 14.88 31.25 16.82	4,194 1,685 3,539 1,905	Low-tech industries Medium low-tech industries Medium high-tech industries High-tech industries
	100.00	11,323	Total

tab RD2015 92.

Cum.	Percent	Freq.	R&D dummy
87.88 100.00	87.88 12.12	9,951 1,372	0 1
	100.00	11,323	Total

93.
94. *-----*
95. * PART 2.1: Checking for Outliers in employment variable
96. *------*
97.
98. set scheme plotplainblind

99. scatter TFP2017 emp2015, ytitle("TFP in 2017")

100 graph save \$results/02_Descriptive_Analysis/emp2015_outliers.gph, /// > replace (file C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdim > atching_deleteEXP/04_results/02_Descriptive_Analysis/emp2015_outliers.gph saved)

101 102 graph export \$results/02_Descriptive_Analysis/emp2015_outliers.png, ///
sas(png) replace
(file C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdim
satching_deleteEXP/04_results/02_Descriptive_Analysis/emp2015_outliers.png written in
PNG format)

```
103
104
                  PART 3: Balance Tables
106
107
                   By treatment variable TECH PORT /// logwages2015 TFP2015 logemp2015 DEBTS2015 EXP2015 RD2015, //
109 /
110 iebaltab
 > /
                          grpvar(FDI2016) ///
savetex("$results/02 Descriptive Analysis/baltest byfdi pre.
  > tex") ///
                           rowvarlabels texdoc replace
     Balance table saved to:
         C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2 Appl_Microeconometrics\
> fdimatching_deleteEXP/04_results/02_Descriptive_Analysis/baltest_byfdi_pre
         > .tex
111
112
113 //
                   By FDI type (treatment arms) [not reported in paper] TECH PORT \ensuremath{///}
114 iebaltab
                          logwages2015 TFP2015 logemp2015 DEBTS2015 EXP2015 RD2015, //
                          grpvar(FDITYPE2016) ///
savetex("$results/02_Descriptive_Analysis/baltest_fditype_pr
  > e.tex") ///
                          rowvarlabels texdoc replace
     Balance table saved to:
         C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2 Appl_Microeconometrics\
> fdimatching_deleteEXP/04_results/02_Descriptive_Analysis/baltest_fditype_p
         > re.tex
 end of do-file
116
119
120
           PART 3: Results
121
123 * PART 3.1: Effect of FDI on TFP 124 *-----
                   do $scripts/03a_Main_Results
126
MAIN RESULTS DO-FILE
                         Applied Microeconometrics
                                        Empirical Project
                                                     Do-File 03a
                                 Estimation of the effect of FDI on TFP.
                   PURPOSE:
                                  PART 1: Several ATE estimations for main model PART 1.1: NN1 Part 1.2: NN5 with caliper 0.05 Part 1.3: IPW
                   OUTLINE:
                                          Part 1.4: AIPW
```

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Covariate balance summary

	Raw	Matched
Number of obs =	11,323	22,646
Treated obs =	4,460	11,323
Control obs =	6,863	11,323

	Standardized	differences	Varia	ance ratio
	Raw	Matched	Raw	Matched
OWN Subsidiaries Independent State	018354 .0616272 .1016402	0175033 0068445 .0130378	.9769702 1.02321 1.100951	.9774223 .9972679 1.01213
TECH Medium low-t~s Medium high-~s High-tech in~s	.1206088 2329159 5425507	0400593 .0104791 .0051861	1.263082 .8156583 .2855456	.9244732 1.008514 1.009211
RD2015 1	.0356507	.016501	1.085768	1.039031
logwages2015 TFP2015 emp2015 DEBTS2015	1300321 178877 .0470091 0529435	.0174603 013165 .0271819 0040148	.9769191 .9473458 5.49725 1.051101	1.009556 .9917016 1.696765 1.017773

```
141
142 *-----*
143 * PART 1.2: NN5 with caliper 0.05
144 *-----*
>
```

```
// ATE cap drop osa1
145
146
147
                   cap drop p1*
                   cap teffects psmatch (TFPS17) ///
                                                                                        (FDI2016 i.($F) c.($C), logit), /// nneighbor(5) caliper(.05) osample(os
  > > > a1) generate(p1)
149
150
151
152
                                                                                        // 5 observations violate caliper
                   // Reestimate cap teffects psmatch (TFPS17) ///
                                                                                         (FDI2016 i.($F) c.($C), logit) if o
 > > sa1==0, ///
                                                                                         nneighbor(5) caliper(.05) generate
  > (p1)
  54
54 outreg2 using $results/05_Tables/Table2_TFP.tex, append dec(3) ///
> drop(i.OWN i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 i.TECH RD2015) ///
> nocon egdrop(TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
> g_deleteEXP/04_results/05_Tables/Table2_TFP.tex
dir : seeout
                   tebalance summarize
      Covariate balance summary
```

	Raw	Matched
Number of obs =	11,318	22,636
Treated obs =	4,456	11,318
Control obs =	6,862	11,318

	Standardized	differences	Vari	ance ratio
	Raw	Matched	Raw	Matched
OWN Subsidiaries Independent State	0190182 .0618259 .1020001	0205252 0100251 .0045727	.976131 1.023258 1.101344	.9738583 .9959379 1.004328
TECH Medium low-t~s Medium high-~s High-tech in~s	.1209652 2325048 5424366	0328628 .0081591 .0045745	1.263818 .816095 .2857586	.9372059 1.006628 1.008117
RD2015 1	.0359419	.0166292	1.086462	1.03894
logwages2015 TFP2015 emp2015 DEBTS2015	1300519 1787364 .0436824 0525752	.0082815 0294567 .0385463 0086042	.977301 .9475049 .5304931 1.051687	1.00904 .9850587 .4724067 1.01474

```
157
158 *---
159 *
160 *---
             PART 1.3: IPW
// ATE
cap drop osal
161
162
163
164
             teffects ipw (TFPS17) (FDI2016 i.($F) c.($C), logit), osample(osa1)
  Treatment-effects estimation

Estimator : inverse-probability weights

Outcome model : weighted mean

Treatment model: logit
                                                           Number of obs = 11,323
                                   Robust
Std. Err.
        TFPS17
                         Coef.
                                                           P>|z|
                                                                       [95% Conf. Interval]
  ATE
     FDI2016
(1 vs 0)
                       .1221664
                                   .0068002
                                                 17.97
                                                           0.000
                                                                       .1088383
                                                                                     .1354945
  POmean
FDI2016
                                                                     -.0872292 -.0493354
                     -.0682823 .0096669 -7.06 0.000
```

outreg2 using \$results/05_Tables/Table2_TFP.tex, append dec(3) ///

drop(i.OWN i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 i.TECH RD2015) ///
nocon eqdrop(TME1)

C:\Users\Emille\Documents\Emillie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin

g deleteEXP/04_results/05_Tables/Table2_TFP.tex 165

dir : seeout

166 167 tebalance summarize

Covariate balance summary

тy	Raw	Weighted
Number of obs = Treated obs = Control obs =	11,323 4,460 6,863	11,323.0 5,630.2 5,692.8

	Standardized	differences	Varia	ance ratio
	Raw	Weighted	Raw	Weighted
OWN Subsidiaries Independent State	018354 .0616272 .1016402	0075057 0006473 .0120719	.9769702 1.02321 1.100951	.990309 .9997498 1.011322
TECH Medium low-t~s Medium high-~s High-tech in~s	.1206088 2329159 5425507	.0037312 0001227 0102215	1.263082 .8156583 .2855456	1.007386 .9999017 .9817943
RD2015 1	.0356507	.0088614	1.085768	1.020464
logwages2015 TFP2015 emp2015 DEBTS2015	1300321 178877 .0470091 0529435	0016836 0199601 .0126666 0129979	.9769191 .9473458 5.49725 1.051101	1.003246 .9420373 1.243208 1.016256

```
168
169 *-
170 *
171 *-
                  PART 1.4: AIWP
172
173
                  // ATE cap drop osa1
                 teffects aipw (TFP2017 ($F)($C) )(FDI2016 i.($F) c.($C) )
   Treatment-effects estimation
                                                                             Number of obs =
                                                                                                                   11,323
  Estimator : augmented IPW
Outcome model : linear by ML
Treatment model: logit
                                              Robust
Std. Err.
          TFP2017
                                  Coef.
                                                                              P>|z|
                                                                                             [95% Conf. Interval]
                                                                      z
   ATE
        FDI2016
(1 vs 0)
                                              .0061911
                                                                 47.14 0.000
                                                                                             .2796885
                              .2918229
                                                                                                                .3039572
   POmean
          FDI2016
                             3.539684
                                               .0195128 181.40 0.000
                                                                                             3.501439
                                                                                                                3.577928
  77 outreg2 using $results/05_Tables/Table2_TFP.tex, append dec(3) ///
> drop(i.OWN i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 i.TECH RD2015) ///
> nocon eqdrop(OME0 OME1 TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
> g_deleteEXP/04_results/05_Tables/Table2_TFP.tex
dir : seeout
178
179
                tebalance summarize
     Covariate balance summary
                                                                                               Weighted
                                                                                               11,323.0
5,630.2
5,692.8
                                                                             11,323
4,460
6,863
                                           Number of obs = Treated obs = Control obs =
```

	Standardized	differences	Vari	ance ratio
	Raw	Weighted	Raw	Weighted
OWN Subsidiaries Independent State	018354 .0616272 .1016402	0075057 0006473 .0120719	.9769702 1.02321 1.100951	.990309 .9997498 1.011322
TECH Medium low-t~s Medium high-~s High-tech in~s	.1206088 2329159 5425507	.0037312 0001227 0102215	1.263082 .8156583 .2855456	1.007386 .9999017 .9817943
RD2015 1	.0356507	.0088614	1.085768	1.020464
logwages2015 TFP2015 emp2015 DEBTS2015	1300321 178877 .0470091 0529435	0016836 0199601 .0126666 0129979	.9769191 .9473458 5.49725 1.051101	1.003246 .9420373 1.243208 1.016256

```
180
181
182
  end of do-file
183
184 *-----
185 * PART 3.2: Robustness Checks 186 *----
                 do $scripts/03b Robustness Checks
Applied Microeconometrics
                                      Empirical Project
                                                 Do-File 03b
                 PURPOSE:
                                Robustness Checks.
                               PART 1: Including Interactions
PART 2: Excluding Outliers
PART 3: Including PORT
PART 4: ATT
PART 5: Analysis by TECH
PART 6: Appendix: Frequency of FDI by TECH
                 OUTLINE:
   *******************
   PART 1: Including Interactions
190
191
          cap drop osal
192
          cap drop p1*
193
          teffects psmatch (TFPS17) ///
                                        (FDI2016 i.($F)##c.($C), logit),
                                                                         ///
                                         osample(osa1) generate(p1)
                                           Number of obs = Matches: requested =
 Treatment-effects estimation
                                                                  11,323
 Estimator : propensity-score matching
Outcome model : matching
Treatment model: logit
                                                       min =
                                                        max =
                          AI Robust
      TFPS17
                   Coef.
                                            P>|z|
                                                     [95% Conf. Interval]
                          Std. Err.
                                        z
      FDI2016
    (1 vs 0)
                 .1520598
                          .0157615
                                      9.65 0.000
                                                     .1211679
                                                                .1829518
          tebalance summarize
   Covariate balance summary
                                               Raw
                                                       Matched
                        Number of obs = Treated obs = Control obs =
                                            11,323
4,460
6,863
                                                        22,646
11,323
                                                        11,323
```

	T			
	Standardized Raw	differences Matched	Varia Raw	nce ratio Matched
OWN Subsidiaries Independent State	018354 .0616272 .1016402	0301379 0196548 .0280783	.9769702 1.02321 1.100951	.9615233 .9919582 1.026604
TECH Medium low-t~s Medium high-~s High-tech in~s	.1206088 2329159 5425507	016179 0260248 .0375841	1.263082 .8156583 .2855456	.9683774 .9785426 1.067129
RD2015 1	.0356507	.0341887	1.085768	1.080693
logwages2015 TFP2015 emp2015 DEBTS2015	1300321 178877 .0470091 0529435	.0235087 .0069241 .0220187 .0128246	.9769191 .9473458 5.49725 1.051101	1.036729 .980012 3.424582 .9874191
OWN# logwages2015 Subsidiaries Independent State	0501523 .0095374 .0578536	0264313 0051365 .0245939	.8787442 .9615021 1.020548	.957907 1.062062 1.011841
OWN# TFP2015 Subsidiaries Independent State	064156 0408866 .0558077	0361761 0118797 .0348481	.8276227 .8831729 1.040186	.9193172 1.000839 1.056287
OWN# emp2015 Subsidiaries Independent State	.0333955 .0268385 .0189749	.0270158 0058267 .00586	17.59077 3.91432 .5735634	16.69265 .9369739 .6417643
OWN# DEBTS2015 Subsidiaries Independent State	0444712 0148901 .0840856	0346152 0132875 .0313432	.8861299 .9654587 1.078225	.9220981 .9511524 1.038717
TECH# logwages2015 Medium low-t~s Medium high-~s High-tech in~s	.0985765 1947846 4878963	0130018 0207019 .0551011	1.221177 .7998561 .2637228	.95976 .9750318 1.200365
TECH# TFP2015 Medium low-t~s Medium high-~s High-tech in~s	.0592069 2626395 4825334	0168126 030936 .0340785	1.09476 .6142341 .2214855	.9223716 .9223356 1.141804
TECH# emp2015 Medium low-t~s Medium high-~s High-tech in~s	.0099385 .0215945 .023925	0232465 .0060306 .0399947	.1033668 .4923478 2.37245	.0229633 .1691328 1.036049
TECH# DEBTS2015 Medium low-t~s Medium high-~s High-tech in~s	.0875624 1987245 4597713	0089829 0020756 .0262805	1.216558 .7404538 .2304414	.9383764 1.01959 1.072064
RD2015# logwages2015				

```
1
             .0055913
                       .0333829
                                     .9912599 1.099438
 RD2015#
TFP2015
1
             .0080044
                       .0475566
                                   .9791256 1.254495
  RD2015#
emp2015
             .0639848
                       .0382383
                                      31.03198 8.471608
RD2015#
DEBTS2015
              .0328123
                       .0266122
                                      1.167688 1.085422
      1
```

199	***********	********
200	* PART 2: Excluding Outl	iers
201	**************	********
202		
203	cap drop osal	
204	cap drop p1*	
205	cap teffects psmatch (TFPS17) ///	
>		(FDI2016 i.(\$F) c.(\$C), logit) if e
>	mp2015<4000000, ///	
>		osample(osa1) generate(p1)
206		

7 tebalance summarize

Covariate balance summary

ry	Raw	Matched
Number of obs = Treated obs = Control obs =	11,321 4,458 6,863	22,642 11,321 11,321

	Standardized	differences	Varia	ance ratio
	Raw	Matched	Raw	Matched
OWN Subsidiaries Independent State	0186455 .0615581 .1019412	0214674 0041437 .0054729	.9766001 1.023189 1.101223	.9725788 .9983425 1.005197
TECH Medium low-t~s Medium high-~s High-tech in~s	.1208152 2326559 5424529	0380474 .0078187 .0047152	1.263528 .8159034 .2856663	.9282785 1.006379 1.00837
RD2015 1	.0358227	.0032695	1.086184	1.007708
logwages2015 TFP2015 emp2015 DEBTS2015	1301697 1790158 .0415358 0528498	.0098616 01456 .0517651 0106762	.9772428 .9477123 1.120857 1.051515	.9891245 .9622371 1.126963 .9991066

```
208
      Outreg2 using $results/05_Tables/Table6_Robustness.tex, append dec(3) ///
drop(i.OWN i.TECH logwages2015 TFP2015 emp2015 DEBTS2015 RD2015) ///
nocon eqdrop(TME1)
C:\Users\Emille\Documents\Emille\Documents\Emille\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
decomposition of the property of the
209
      dir : seeout
214
215 global P "OWN TECH RD2015 PORT"
216
217
                                    cap drop osal
218
                                    cap drop p1*
                                    219
                                                                                                                                                                                                                                                                         ///
220
 221
                                      tebalance summarize
           Covariate balance summary
                                                                                                                                                                                                     Matched
                                                                                        Number of obs = Treated obs = Control obs =
                                                                                                                                                              11,323
4,460
6,863
                                                                                                                                                                                                        22,646
11,323
11,323
                                                                   Standardized differences
Raw Matched
                                                                                                                                                                              Variance ratio
Raw Matched
                                                  OWN
                   Subsidiaries
Independent
                                                                                                              -.0200286
.0032353
-.0052983
                                                                            -.018354
.0616272
                                                                                                                                                              .9769702
1.02321
                                                                                                                                                                                                  .97423
1.001221
                                       State
                                                                             .1016402
                                                                                                                                                              1.100951
                                                                                                                                                                                                  .9948827
                                             TECH
            Medium low-t~s
Medium high-~s
High-tech in~s
                                                                                                              -.0586116
-.002487
.0329806
                                                                             .1206088
                                                                                                                                                              1.263082
                                                                                                                                                                                                  .8913964
                                                                         -.2329159
-.5425507
                                                                                                                                                              .8156583
.2855456
                                                                                                                                                                                                 .9979324
                                        RD2015
                                                                            .0356507
                                                                                                                .0246992
                                                                                                                                                              1.085768
                                                                                                                                                                                               1.058193
                                              PORT
            Ports within~m
                                                                             .4092869
                                                                                                                                                              1.253595
                                                                                                                  .0661913
                                                                                                                                                                                                1.041592
                      logwages2015
                                                                          -.1300321
                                                                                                                   .0176969
                                                                                                                                                               .9769191
                                                                                                                                                              .9473458
5.49725
1.051101
                                TFP2015
emp2015
DEBTS2015
                                                                                                                                                                                                  .9480748
3.052481
1.007143
                                                                            -.178877
                                                                                                               -.0131356
                                                                          .0470091
-.0529435
                                                                                                                 .0419073
```

```
222
223
  22
23 outreg2 using $results/05 Tables/Table6 Robustness.tex, append dec(3) ///
> drop(i.OWN i.TECH i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 RD2015) ///
> nocon eqdrop(TME1)
C:\Users\Emille\Documents\Emillie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
> g_deleteEXP/04_results/05_Tables/Table6_Robustness.tex
   dir : seeout
228
229
                cap drop osa1
230
                cap drop p1*
231
                cap teffects psmatch (TFPS17) ///
                                                                         (FDI2016 i.($F) c.($C), logit), atet
                                                                        osample(osa1) generate(p1)
232
233
                tebalance summarize
     Covariate balance summary
                                                                          Raw
                                                                                       Matched
                                       Number of obs = Treated obs = Control obs =
                                                                      11,323
4,460
                                                                                          8,920
                                                                                          4,460
                                                                        6,863
                                                                                          4,460
                              Standardized differences
                                                                             Variance ratio
                                                    Matched
                                                                             Raw
                                                                                       Matched
                                        Raw
        Subsidiaries
                                  -.018354
.0616272
.1016402
                                                                      .9769702
                                                                                      1.014212
                                                     .010732
         Independent
State
                                                  .0099883
                                                                      1.02321
1.100951
                                                                                      1.00318
                                                 -.0294066
                    TECH
     Medium low-t~s
Medium high-~s
High-tech in~s
                                  .1206088
                                                 -.0553476
                                                                      1.263082
                                                                                     1.017453
1.015497
                                -.2329159
-.5425507
                                                  .0145945
                                                                      .8156583
.2855456
                 RD2015
                                  .0356507
                                                  .0196597
                                                                      1.085768
                                                                                      1.045608
         logwages2015
TFP2015
emp2015
DEBTS2015
                                -.1300321
                                                   .0080137
                                                                      .9769191
                                                                                      .9922576
                                 -.178877
.0470091
-.0529435
                                                 -.0156447
.0210317
-.0152205
                                                                      .9473458
5.49725
1.051101
                                                                                      1.002034
2.356114
1.029529
234
                outreg2 using $results/05 Tables/Table6 Robustness.tex, append dec(3) /// drop(i.OWN i.TECH logwages2015 TFP2015 \overline{e}mp2015 DEBTS2015 RD2015) ///
  > nocon eqdrop(TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2 Appl_Microeconometrics\fdimatchin
```

> g_deleteEXP/04_results/05_Tables/Table6_Robustness_tex dir : seeout

```
246
         cap drop p1
       teffects psmatch (TFPS17) ///
247
                                          (FDI2016 i.($F) c.($C), logit) if TECH==1,
      ///
                                          osample(osa1) generate(p1)
 note: 1.TECH omitted because of collinearity
 Treatment-effects estimation
Estimator : propensity-score matching
Outcome model : matching
Treatment model: logit
                                             Number of obs = Matches: requested =
                                                                      4,194
                                                          min =
max =
                           AI Robust
Std. Err.
      TFPS17
                    Coef.
                                              P>|z|
                                                        [95% Conf. Interval]
 ATE FDI2016 (1 vs 0)
                  .1600066
                           .0195613
                                        8.18 0.000
                                                     .1216672
                                                                 .1983461
```

248 249

tebalance summarize

	Kaw	Matched
Number of obs =	4,194	8,388
Treated obs =	2,325	4,194
Control obs =	1,869	4,194

	Standardized	differences	Varia	ance ratio
	Raw	Matched	Raw	Matched
OWN Subsidiaries Independent State	.0299781 .0057604 0250578	.0150625 0071951 0015653	1.036398 1.001373 .9786308	1.018467 .9984236 .9986098
RD2015 1	.0165825	0014964	1.041031	. 9963872
logwages2015	0219915	.0051526	1.012966	1.058301
TFP2015	.0072539	.0099917	.9676072	1.008227
emp2015	.0253438	0031803	4.356693	1.864609
DEBTS2015	0474876	.0088166	1.031416	.9736994

```
250
251
   outreg2 using $results/05_Tables/Table7_Robustness.tex, replace dec(3) ///
> drop(i.OWN i.TECH i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 RD2015) ///
> nocon eqdrop(TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
> g_deleteEXP/04_results/05_Tables/Table7_Robustness.tex
   dir : seeout
252
253 *=======
254 * (2) NN1 TECH=2
255 *======*
256
257
                   cap drop osal
258
                  cap drop p1
259
                 teffects psmatch (TFPS17) ///
                                                                          (FDI2016 i.($F) c.($C), logit) if TECH==2,
            ///
                                                                          osample(osal) generate(p1)
   note: 2.TECH omitted because of collinearity
   Treatment-effects estimation
Estimator : propensity-score matching
Outcome model : matching
Treatment model: logit
                                                                               Number of obs = Matches: requested =
                                                                                                                           1,685
                                                                                                        min =
max =
                                                AI Robust
Std. Err.
            TFPS17
                                                                                                  [95% Conf. Interval]
                                   Coef.
                                                                                  P>|z|
   ATE
          FDI2016
        (1 vs 0)
                                                                                                  .0315463
                                                                                                                      .1412652
                               .0864057
                                                    .02799
                                                                                0.002
                                                                      3.09
```

260 261 tebalance summarize

ar y	Raw	Matched
Number of obs = Treated obs = Control obs =	1,685 781 904	3,370 1,685 1,685

	Standardized	differences	Vari	ance ratio
	Raw	Matched	Raw	Matched
OWN Subsidiaries Independent State	0789459 .0356487 .094977	0222737 .0449057 0685426	.9057037 1.015483 1.082362	.9730349 1.019382 .9424559
RD2015 1	.0196745	.010822	1.04555	1.025096
logwages2015	0321255	.0186688	.9187912	.9609082
TFP2015	1550946	0443829	.9364425	.971122
emp2015	.0032877	.0284799	.0754936	.1191435
DEBTS2015	0426368	0683897	.9498591	.9548114

```
262
263
         outreg2 using $results/05_Tables/Table7_Robustness.tex, append dec(3) ///
drop(i.OWN i.TECH i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 RD2015) ///
cocon eqdrop(TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
discrepance account discrepance and applementation of the control of the control
          dir : seeout
264
265 *=======
266 * (3) NN1 TECH=3
267 *=======*
268
269
                                                         cap drop osal
270
                                                     cap drop p1
                                                    teffects psmatch (TFPS17) ///
                                                                                                                                                                                                                            (FDI2016 i.($F) c.($C), logit) if TECH==3,
                                     ///
                                                                                                                                                                                                                               osample(osal) generate(p1)
         note: 3.TECH omitted because of collinearity
         Treatment-effects estimation
Estimator : propensity-score matching
Outcome model : matching
Treatment model: logit
                                                                                                                                                                                                                                              Number of obs = Matches: requested =
                                                                                                                                                                                                                                                                                                                                                                                3,539
                                                                                                                                                                                                                                                                                                                       min =
max =
                                                                                                                                                  AI Robust
Std. Err.
                                     TFPS17
                                                                                                                                                                                                                                                     P>|z|
                                                                                                                                                                                                                                                                                                      [95% Conf. Interval]
                                                                                                           Coef.
        ATE FDI2016
                         (1 vs 0)
                                                                                                                                                                                                                                                                                                     .1355612
                                                                                                                                                                                                                                                                                                                                                                 .2086444
                                                                                               .1721028
                                                                                                                                                      .018644
                                                                                                                                                                                                                                                0.000
                                                                                                                                                                                                                  9.23
```

272 273 tebalance summarize

± y	Raw	Matched
Number of obs =	3,539	7,078
Treated obs =	1,107	3,539
Control obs =	2,432	3,539

	Standardized	differences Matched	Varia Raw	ance ratio Matched
	I/GW		I/CIW	Macched
OWN Subsidiaries Independent State	1276748 .0120872 .1432813	.0379035 0217603 0069098	.8473309 1.004115 1.136897	1.04502 .9928833 .9933102
RD2015 1	.0824806	.0169456	1.193028	1.038603
logwages2015 TFP2015 emp2015 DEBTS2015	.0255104 2410387 .074703 0640427	0187561 .0237954 .0528976 0229667	.9997901 .9260925 .6929332 1.051649	1.053611 .983687 .4838172 1.008139

```
274
275
  /4
/5 outreg2 using $results/05 Tables/Table7 Robustness.tex, append dec(3) ///
> drop(i.OWN i.TECH i.PORT logwages2015 TFP2015 emp2015 DEBTS2015 RD2015) ///
> nocon eqdrop(TME1)
C:\Users\Emille\Documents\Emille\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
> g_deleteEXP/04_results/05_Tables/Table7_Robustness.tex
   dir : seeout
276
277 *=====
278 * (4) NN1 TECH=4
279 *========*
280
281
                  cap drop osal
282
                 cap drop p1
283
                teffects psmatch (TFPS17) ///
                                                                      (FDI2016 i.($F) c.($C), logit) if TECH==4,
           ///
                                                                       osample(osa1) generate(p1)
   note: 4.TECH omitted because of collinearity
   Treatment-effects estimation
                                                                            Number of obs
                                                                                                                     1,905
                                                                            Matches: requested =
   Estimator : propensity-score matching
Outcome model : matching
Treatment model: logit
                                                                                                   min =
max =
                                              AI Robust
                                                                                             [95% Conf. Interval]
            TFPS17
                                  Coef.
                                                                              P> | z |
                                              Std. Err.
  ATE FDI2016
       (1 vs 0)
                              .1802721
                                              .0541962
                                                                  3.33
                                                                             0.001
                                                                                             .0740494
                                                                                                                .2864947
284
                  tebalance summarize
      Covariate balance summary
                                                                                                 Matched
                                                                                                   3,810
1,905
1,905
                                           Number of obs = Treated obs = Control obs =
                                                                               1,905
                                                                               247
1,658
                                Standardized differences
Raw Matched
                                                                                     Variance ratio
Raw Matched
                        OWN
                                    -.0779614
.0522384
                                                       .0826873
-.047133
                                                                              .8814802
1.044866
         Subsidiaries
                                                                                               1.126006
.9587982
          Independent State
                                                      -.0427479
                                      .1691889
                                                                              1.241433
                                                                                               .9400229
                   RD2015
                                      .0789006
                                                        .0224257
                                                                              1.201598
                                                                                               1.053092
          logwages2015
TFP2015
emp2015
DEBTS2015
                                   -.0580162
                                                         .1881349
                                                                              1.050215
                                                                                                1.12134
                                   -.2259366
.2584443
-.1862477
                                                        .0580305
.152738
.0230111
                                                                             1.027535
9.989972
1.1001
                                                                                               1.144253
1.226081
1.019314
```

-> tabulation of TECH by FDI2016

Key
frequency row percentage

	FDI/TREATME		
Technology intensity	0	1	Total
Low-tech industries	1,869	2,325	4,194
	44.56	55.44	100.00
Medium low-tech indus	904	781	1,685
	53.65	46.35	100.00
Medium high-tech indu	2,432	1,107	3,539
	68.72	31.28	100.00
High-tech industries	1,658	247	1,905
	87.03	12.97	100.00
Total	6,863	4,460	11,323
	60.61	39.39	100.00

```
298
299 tabout TECH FDI2016 using $results/05_Tables/Table7a_Robustness.tex, ///
> cells(freq row cum) format(0 1) style(tex) clab(No. Col_% Cum_%) replace
```

Table output written to: C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Mic > roeconometrics\fdimatching_deleteEXP/04_results/05_Tables/Table7a_Robustness.tex

```
& \multicolumn{9}{c}{FDI/TREATMENT dummy in 2016} \\
Technology intensity & \multicolumn{3}{c}{0} & \multicolumn{3}{c}{1} & \multicolumn{3}$
> {c}{Total} \\
$No.&Col \%&Cum \%&No.&Col \%&Cum \% \\\
\hline
Low-tech industries&1869&44.6&27.2&2325&55.4&52.1&4194&100.0&37.0 \\
Medium low-tech industries&904&53.6&40.4&781&46.4&69.6&1685&100.0&51.9 \\
Medium high-tech industries&2432&68.7&75.8&1107&31.3&94.5&3539&100.0&83.2 \\
High-tech industries&158&87.0&100.0&247&13.0&100.0&1905&100.0&100.0 \\
Total&6863&60.6&44460&39.4&&11323&100.0& \\
Total&6863&60.6&44460&39.4&&11323&100.0& \\
```

```
300
 end of do-file
301
302 *-----
303 * PART
304 *----305
          PART 3.3: Analysis by Type of FDI
                  do $scripts/03c_by_FDITYPE
306
Applied Microeconometrics
                                       Empirical Project
                                                   Do-File 03c
                                Estimation of the effect of different types of FDI o
                  PURPOSE:
 > n TFP.
                                 PART 1: Multinnominal Logit Models
1.1: AIPW
1.2: IPW
PART 2: Seperate Models
                  OUTLINE:
                                                 2.1 AIPW
   ******************
        PART 1: Mulitnominal Logit Models
309 *----
310 *
          PART 1.1:
311 *--
          teffects aipw (TFPS17 i.($F) c.($C) )(FDITYPE2016 i.($F) c.($C) )
 Treatment-effects estimation
Estimator : augmented IPW
Outcome model : linear by ML
Treatment model: (multinomial) logit
                                              Number of obs = 11,323
                            Robust
       TFPS17
                    Coef.
                                              P>|z|
                                                       [95% Conf. Interval]
 ATE
   FDITYPE2016
  FDITIFE (Exports -.. vs
  No FDI)
(Technolo..
                  .1435197
                           .0058746
                                       24.43 0.000
                                                      .1320058
                                                                 .1550337
    No FDI)
                  .1394529
                           .0045442
                                       30.69
                                             0.000
                                                       .1305465
                                                                  .1483593
  ( Domesti..
     No FDI)
                  .1432132
                            .0040598
                                       35.28
                                              0.000
                                                       .1352561
                                                                   .1511702
  POmean
  FDITYPE2016
No FDI
                                                      -.0751731
                -.0565761
                           .0094884
                                       -5.96 0.000
                                                                 -.0379792
```

314 315 tebalance summarize

Treatmen			Treatment Raw Weighte		Weighted
No FDI	=	6,863	2,845.1		
Exports-ori~I		940	2,863.3		
Technology ~I		1,555	2,800.4		
Domestic ma~I		1,965	2,814.2		
Total		11,323	11,323.0		

				
	Standardized	differences	Varia	ance ratio
	Raw	Weighted	Raw	Weighted
Exports-orien~I OWN Subsidiaries Independent State	.029319	0159056	1.037004	.9793819
	.0711904	0519146	1.026993	.977249
	.0619914	.0177173	1.064555	1.016531
TECH Medium low-t~s Medium high-~s High-tech in~s	.0789971	0130459	1.173675	.974177
	2663044	0193414	.7842619	.9838819
	5946766	.0430247	.222571	1.076075
RD2015 1	1977282	.0562092	.5536423	1.130642
logwages2015	1833482	0587338	.9447749	.9103155
TFP2015	2141912	.0133092	.9704629	1.001579
emp2015	.0249499	.0555541	.3077821	.5456246
DEBTS2015	0665162	.0400558	1.024821	.9617875
Technology in~I OWN Subsidiaries Independent State	0227822	.0149411	.9717411	1.019102
	.0312067	0110143	1.013148	.9956038
	.1341894	.0156322	1.12989	1.01462
TECH Medium low-t~s Medium high-~s High-tech in~s	.1501373	.0016789	1.327181	1.003328
	2403611	0011011	.8089302	.9991046
	5607553	0181223	.2633246	.9676973
RD2015 1	0894951	0019277	.7908312	.9955541
logwages2015	1365085	0151862	.9818968	1.023026
TFP2015	2091214	0276276	.9481316	.9447849
emp2015	.0498435	.0196187	10.65892	1.505357
DEBTS2015	0186904	0394986	1.105096	1.080391
Domestic mark~I				
OWN Subsidiaries Independent State	0381328 .0810348 .0945175	0094519 .0179192 .0001241	.9519123 1.02923 1.094776	.9877872 1.006665 1.000121
TECH Medium low-t~s Medium high-~s High-tech in~s	.1164522	.001678	1.254467	1.003325
	211331	.0001045	.8359902	1.000089
	5049792	011019	.3324869	.9803731
RD2015 1	.2082867	.0056421	1.503124	1.013047
logwages2015	0997247	.0102345	.9871457	1.013854
TFP2015	1378965	0090628	.9336303	.938248

.0558724

-.0741218

.0075184

3.896824

1.020553

.902008

979131

emp2015

DEBT\$2015

```
-.0206654
   teffects overlap, ptlevel(1) ///

> saving($results\04 bytype\bytype_overlap_l1.gph, replace)
(file C:\Users\Emilie\Documents\Emilīe\Master\Nottingham\2_Appl_Microeconometrics\fdim
> atching_deleteEXP/04_results\04_bytype\bytype_overlap_l1.gph_saved)
   teffects overlap, ptlevel(2) ///

saving($results\04 bytype\bytype overlap 12.gph, replace)

(file C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdim

atching_deleteEXP/04_results\04_bytype\bytype_overlap_12.gph saved)
320
321
   20 21 teffects overlap, ptlevel(3) ///
21 saving($results\04 bytype\bytype_overlap_13.gph, replace)
(file C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdim > atching_deleteEXP/04_results\04_bytype\bytype_overlap_13.gph_saved)
322
323
   outreg2 using $results\04 bytype\bytype table 1.tex, replace dec(3) ///

drop(OWN TECH RD2015 logwages2015 TFF2015 emp2015 DEBTS2015) ///

nocon eqdrop(OME0 OME1 OME2 OME3 TME1 TME2 TME3) lab()
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_App1_Microeconometrics\fdimatchin
   2 g_deleteEXP/04_results\04_bytype\bytype_table_1.tex
dir : seeout
324
325
326 *-----
327 * PART 1.2: IPW 328 *----
329
330
                   teffects ipw (TFPS17 )(FDITYPE2016 i.($F) c.($C))
   = 11,323
   Treatment-effects estimation
                                                                                   Number of obs
   Estimator : inverse-probability weights
Outcome model : weighted mean
Treatment model: (multinomial) logit
                                                 Robust
Std. Err.
             TFPS17
                                                                                                    [95% Conf. Interval]
                                    Coef.
                                                                                   P>|z|
     FDITYPE2016
   (Exports-.. vs
No FDI)
                               .1570882
                                                  .0316177
                                                                       4.97 0.000
                                                                                                    .0951187
                                                                                                                       .2190577
   (Technolo.. vs
No FDI)
                                .1123436
                                                 .0177869
                                                                       6.32
                                                                                 0.000
                                                                                                    .077482
                                                                                                                       .1472052
    ( Domesti..
         No FDI)
                                .1342705
                                                  .0106457
                                                                      12.61
                                                                                   0.000
                                                                                                    .1134052
                                                                                                                        .1551357
   POmean
FDITYPE2016
                              -.0684059
                                                  .0096686
                                                                      -7.08
                                                                                   0.000
                                                                                                 -.0873559
                                                                                                                     -.0494558
```

331 332 tebalance summarize

Treatmen	t	Observat Raw	tions Weighted
No FDT		6,863	2,845.1
Exports-ori~I	=	940	2,863.3
Technology ~I		1,555	2,800.4
Domestic ma~I	=	1,965	2,814.2
Total	=	11,323	11,323.0

·				
	Standardized Raw	differences Weighted	Varia Raw	ance ratio Weighted
Exports-orien~I				
OWN Subsidiaries Independent State	.029319 .0711904 .0619914	0159056 0519146 .0177173	1.037004 1.026993 1.064555	.9793819 .977249 1.016531
TECH Medium low-t~s Medium high-~s High-tech in~s	.0789971 2663044 5946766	0130459 0193414 .0430247	1.173675 .7842619 .222571	.974177 .9838819 1.076075
RD2015 1	1977282	.0562092	.5536423	1.130642
logwages2015 TFP2015 emp2015 DEBTS2015	1833482 2141912 .0249499 0665162	0587338 .0133092 .0555541 .0400558	.9447749 .9704629 .3077821 1.024821	.9103155 1.001579 .5456246 .9617875
Technology in~I				
OWN Subsidiaries Independent State	0227822 .0312067 .1341894	.0149411 0110143 .0156322	.9717411 1.013148 1.12989	1.019102 .9956038 1.01462
TECH Medium low-t~s Medium high-~s High-tech in~s	.1501373 2403611 5607553	.0016789 0011011 0181223	1.327181 .8089302 .2633246	1.003328 .9991046 .9676973
RD2015 1	0894951	0019277	.7908312	.9955541
logwages2015 TFP2015 emp2015 DEBTS2015	1365085 2091214 .0498435 0186904	0151862 0276276 .0196187 0394986	.9818968 .9481316 10.65892 1.105096	1.023026 .9447849 1.505357 1.080391
Domestic mark~I				
OWN Subsidiaries Independent State	0381328 .0810348 .0945175	0094519 .0179192 .0001241	.9519123 1.02923 1.094776	.9877872 1.006665 1.000121
TECH Medium low-t~s Medium high-~s High-tech in~s	.1164522 211331 5049792	.001678 .0001045 011019	1.254467 .8359902 .3324869	1.003325 1.000089 .9803731
RD2015 1	.2082867	.0056421	1.503124	1.013047
logwages2015 TFP2015	0997247 1378965	.0102345 0090628	.9871457 .9336303	1.013854 .938248

.0558724

-.0741218

.0075184

-.0206654

3.896824

1.020553

.902008

.979131

```
emp2015
DEBTS2015
333
334
  33
34 outreg2 using $results\04_bytype\bytype_table_1.tex, append dec(3) ///
> drop(OWN TECH RD20T5 logwages2015 TFP20T5 emp20T5 DEBTS20T5) ///
> nocon eqdrop(OME 0 OME1 OME2 OME3 TME1 TME2 TME3)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2_Appl_Microeconometrics\fdimatchin
  > g deleteEXP/04_results\04_bytype\bytype_table_1.tex
  dir : seeout
335
336
337
338
339
340
    *******************
340 *
341 **
                           PART 2: Seperate Logit Models
348 * Type 1 (Exports-oriented FDI) 349 *-----*
350 //
351
352
             Type 0: No FDI
             teffects aipw (TFPS17 i.($F) c.($C) )(FDI2016 c.($C) i.($F) ) /// if FDITYPE2016==1 | FDITYPE2016==0
  Treatment-effects estimation
                                                        Number of obs =
                                                                                    7,803
  Estimator : augmented IPW Outcome model : linear by ML
  Treatment model: logit
                                  Robust
        TFPS17
                        Coef.
                                                        P> | z |
                                                                   [95% Conf. Interval]
                                 Std. Err.
  ATE
       FDI2016
     (1 vs 0)
                     .1404936
                                 .0065984
                                               21.29
                                                        0.000
                                                                   .1275609
                                                                                 .1534263
  POmean
       FDI2016
                    -.0124852
                                 .0114371
                                               -1.09
                                                        0.275
                                                                  -.0349014
                                                                                  .009931
353
354
            tebalance summarize
    Covariate balance summary
                                                           Raw
                                                                    Weighted
                                                         7,803
                                                                     7,803.0
                               Number of obs =
                               Treated obs = Control obs =
                                                           940
                                                                     3,925.4
                                                         6,863
                                                                     3,877.6
```

```
Standardized differences Raw Weighted
                                                                               Variance ratio
Raw Weighted
                                                -.0716673
-.0226294
.1195926
.0552287
                                                                        .9447749
.9704629
.3077821
                             -.1833482
-.2141912
.0249499
    logwages2015
TFP2015
                                                                                          .8859531
                                                                                         1.017289
            emp2015
                             -.0665162
         DEBTS2015
                                                                        1.024821
                                                                                          .9583953
                  OWN
                                              -.0418346
-.0755765
  Subsidiaries
Independent
                               .029319
.0711904
                                                                        1.037004
1.026993
                                                                                        .9471116
.9630798
                               .0619914
                                                 .0531902
                                                                        1.064555
                                                                                         1.053691
            State
                TECH
Medium low-t~s
Medium high-~s
                                .0789971
                                                -.0161178
-.0297073
.0462235
                                                                        1.173675
.7842619
.222571
                                                                                         .9655996
                             -.2663044
-.5946766
                                                                                         .9791179
1.062059
High-tech in~s
            RD2015
                             -.1977282
                                                  .0875198
                                                                        .5536423 1.221739
```

```
355
356
  obto
66 outreg2 using $results\04 bytype\bytype table_1.tex, append dec(3) ///
> drop(OWN TECH RD2015 logwages2015 TFP2015 emp2015 DEBTS2015) ///
> nocon eqdrop(OME0 OME1 TME1)
C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2 Appl_Microeconometrics\fdimatchin
> q deleteEXP/04 results\04 bytype\bytype_table_1.tex
dir secont
  dir : seeout
357
358
359 *===========
360 * Type 2(Technology intensive FDI)
361 *===
                 teffects aipw (TFPS17 i.($F) c.($C) )(FDI2016 c.($C) i.($F) ) /// if FDITYPE2016==2 | FDITYPE2016==0
  Treatment-effects estimation
                                                                          Number of obs
                                                                                                                8,418
  Estimator : augmented IPW
Outcome model : linear by ML
Treatment model: logit
                                Robust
Coef. Std. Err.
          TFPS17
                                                                           P>|z|
                                                                                          [95% Conf. Interval]
  FDI2016
(1 vs 0)
                                                                                          .1297718
                            .1393538
                                            .0048889
                                                               28.50
                                                                          0.000
                                                                                                            .1489358
   POmean
         FDI2016
                           -.0249796
                                                   .011
                                                              -2.27 0.023
                                                                                        -.0465391
                                                                                                             -.00342
```

364 365

tebalance summarize

	Raw	Weighted
Number of obs =	8,418	8,418.0
Treated obs =	1,555	4,169.7
Control obs =	6,863	4,248.3

	Standardized	differences	Varia	ance ratio
	Raw	Weighted	Raw	Weighted
logwages2015	1365085	0165004	.9818968	1.025628
TFP2015	2091214	0607962	.9481316	.9409475
emp2015	.0498435	.037521	10.65892	1.875564
DEBTS2015	0186904	0532078	1.105096	1.091496
OWN Subsidiaries Independent State	0227822 .0312067 .1341894	.0006329 017564 .0387922	.9717411 1.013148 1.12989	1.000803 .992243 1.037702
TECH Medium low-t~s Medium high-~s High-tech in~s	.1501373	.0029158	1.327181	1.006
	2403611	0057285	.8089302	.9959361
	5607553	0217103	.2633246	.9682538
RD2015 1	0894951	.0036693	.7908312	1.009067

```
67 outreg2 using $results\04_bytype\bytype table 1.tex, append dec(3) ///

> drop(OWN TECH RD2015 logwages2015 TFP2015 emp2015 DEBTS2015) ///

> nocon eqdrop(OMEO OME1 TME1)

C:\Users\Emilie\Documents\Emilie\Master\Nottingham\2 Appl_Microeconometrics\fdimatchin

> g_deleteEXP/04_results\04_bytype\bytype_table_1.tex

dir: seeout
366
367
368
369
370 *-----*
371 * Type 3 (Domestic market seeking FDI)
372 *-----*
373
374
                    teffects aipw (TFPS17 i.($F) c.($C) )(FDI2016 c.($C) i.($F) ) /// if FDITYPE2016==3 | FDITYPE2016==0
   Treatment-effects estimation
Estimator : augmented IPW
Outcome model : linear by ML
Treatment model: logit
                                                                                     Number of obs = 8,828
                                                   Robust
Std. Err.
            TFPS17
                                     Coef.
                                                                                      P> | z |
                                                                                                       [95% Conf. Interval]
   ATE
       FDI2016
(1 vs 0)
                                 .1428096
                                                    .0042927
                                                                        33.27
                                                                                                       .1343961
                                                                                                                             .1512231
                                                                                      0.000
   POmean
FDI2016
                               -.0173178
                                                    .0107047
                                                                        -1.62
                                                                                     0.106
                                                                                                      -.0382987
                                                                                                                             .0036632
```

375 376

tebalance summarize

	Raw	Weighted
Number of obs =	8,828	8,828.0
Treated obs =	1,965	4,386.6
Control obs =	6,863	4,441.4

	Standardized	differences	Varia	ance ratio
	Raw	Weighted	Raw	Weighted
logwages2015	0997247	.0143064	.9871457	1.018875
TFP2015	1378965	0343519	.9336303	.9395222
emp2015	.0558724	.0171481	3.896824	.9394148
DEBTS2015	0741218	0281171	1.020553	.9867092
OWN Subsidiaries Independent State	0381328 .0810348 .0945175	0225617 .0149455 .0189725	.9519123 1.02923 1.094776	.9708481 1.005709 1.018936
TECH Medium low-t~s Medium high-~s High-tech in~s	.1164522	.0025253	1.254467	1.005217
	211331	0033973	.8359902	.9975718
	5049792	0136332	.3324869	.9796925
RD2015 1	.2082867	.0082827	1.503124	1.017821