

The Evaluation of the Italian Start Up Act in Lombardy

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Abstract

The paper investigates the impact of the Italian Start Up Act, namely how much state aid, given to innovative enterprises from 2012 onward, improves Italy's digital transition. We construct a panel data considering observations from 2008 to 2018 and including balance sheet variables of over 160,000 small and medium-companies. We run fixed effect estimations to try to disentangle the effect of the policy comparing firms that registered to the Start Up Act with similar enterprises that did not. Results show a high positive effect on the variables considered but the violation of the parallel trend assumption suggests that we were not successful in building a good control group. In light of this, we follow Callaway and Sant'Anna's approach (2021) to construct event studies on the evolution of balance sheet variables for innovative enterprises. We find that firms experience high growth when receiving incentives from the government but not all of them are able to sustain the trend after leaving the policy.

1 Introduction

The Great Recession of 2008 followed by the European crisis of sovereign debts left Italy into a fragile socio-economic situation, in which high unemployment went hand in hand with low wages and low incentives to open enterprises[1]. In 2012, Italian government prepared a plan of economic reconstruction called “Salva Italia” law decree. Among the policies presented, the Start Up Act aims at transforming Italy into a more favourable environment for innovation. In a world in which the promotion of digital transition plays a central role, the StartUp Act incentivises the creation and development of enterprises based on creativity, innovation, and the use of new technology[2].

Italy hosts a high percentage (97.7%[3]) of micro and small firms with respect to the other OECD countries, giving the policy a wide range of application. In light of recent researches suggesting that small and medium-sized enterprises may be the drivers for economic growth [4], the Start Up Act represents the attempt of the Italian government to keep up with the other European countries’ economic growth and productivity rates [5], especially in the field of innovation and technology.

1.1 Eligibility criterias

Eligible companies are denominated “Young Innovative Companies” (YICs) and receive a number of incentives which can help them to spur innovation-oriented investment and encourage youth employment [6].

To enter the policy, a company should meet the following criteria. The enterprise should be a limited company not publicly listed, either Italian or a branch of an EU company registered in Italy. The establishment date must be within five years and the headquarter must be in Italy. Its annual revenue should be less than 5 million euros and the mission of the company must include a statement on innovation. Lastly, at least one of the following elements should be present:

1. At least 15% of revenues should be invested in R&D;
2. 1/3 of the employees must hold a PhD or be graduates or researchers and/or 2/3 of them must hold a Master’s degree;
3. The enterprise must be a holder, a depositor or a licensee of a patent or owner or author of registered software.

1.2 Benefits

Among the different benefits given by the Start Up Act, three are the main ones [7]. Eligible companies receive tax incentives for equity investment; innovative startups get a 30% tax credit and fiscal deduction as legal entities. In addition, they are allowed to obtain a simplified procedure to get credit guarantees on bank loans, which covers up to 80% of the bank loans and up to a maximum of 2.5 million euros, provided through a Government Fund called “Fondo Centrale di Garanzia”. Finally innovative companies are granted with flexible labor rules. There is no limit to duration and total number of renewals and no obligation to keep a fixed ratio between fixed-term and open-ended contracts [8].

1.3 Our research

The aim of this research is to evaluate the impact of the Start Up Act. We run a panel fixed effect estimation on some entries of the companies’ balance sheets, which we use as expression

of economic performance. After ten years from the start of the policy, we try to encompass its effectiveness in the small and medium term.

The peculiarity when analyzing the Start Up Act is that its economic and social performance is monitored every three months by the Ministry of Enterprises and Made in Italy, which gathers all information in “Registro Imprese”. This allows the government to keep track of the effects of the policy, see if the initial objectives are satisfied, and eventually improve the decree.

2 Academic Literature

Earlier studies on the impact of the Italian Start Up Act display significant results both on our area of investigation and among other economic achievements.

The OECD research (2018) shows that innovative firms increase their financing through venture capital due to an improvement of their economic credibility. They experience an increase around 10-15% in total revenues, value added and total assets. Intangible capital, which represent an important indicator for startups’ innovative achievements, increase in proportion to total capital. The same paper analyzes the firms’ survival probability through a logit model and depicts a decreasing trend of failure for firms that enter the policy with respect to those that do not[5].

A research conducted by Politecnico di Milano (2019) reports an analysis on the relationship between access to a Government-guaranteed (GG) bank loan program and fiscal incentives for venture capital (VC) equity investments[6].

The Microeconomic Problem Evaluation carried out by Biancalani, Czarnitzki and Riccaboni (2021) through the implementation of a conditional difference-in-difference model displays positive results of the Start Up Act. Treated companies result to have an easier access to equity and debt capital, impacting multiple economic dimensions of the business[7].

3 Data and Methodology

3.1 Data

The analysis of the Start-up Act exploits two main resources. The primary dataset, containing observations regarding 160,625 firms, has been downloaded by AIDA website. We consider as small-medium firms all the companies that at least in one of the years observed has less than 250 employees, returns on sales lower than 50 million euros and total assets lower than 43 million euros. We merge the AIDA dataset with the one containing the year in which each firm entered the Act (only for innovative firms), available on the “StartUp Registro Imprese” database. We consider the firms that did not provide the year of registration to the policy innovative from the year of establishment.

The analysis takes into consideration all startups and small-medium firms established in Lombardy between 2008 and 2018. For each enterprise we report 9 observations in relative terms, from the last year in which the balance sheet is available until a maximum of eight years before. It is reported the year of the first available balance sheet, the year of establishment and the year in which each observation is taken. To each firm it is assigned its “age”, which is the difference between the year of the last balance sheet available and the first one. Each enterprises have an identification number that goes from 1 to 160,635 and identifies them uniquely, together with the fiscal code. Companies are classified by their Ateco code (2007) which defines to which sector the firms belong to. We create a time-invariant dummy variable “EverTreated” which

displays 1 if the firm applied the policy at least in one year of the sample, and 0 if it has never been treated. Finally, we construct a time-variant dummy variable “Post” which is equal to 1 whenever the firm is treated in the year considered, and 0 otherwise.

We select 11 variables of interest with the aim of describing the evolution of small-medium firms from an economic and social point of view. We report the number of employees and their labor productivity in order to track whether the prerequisites of including PhD students or master students as employees is successful. It is also reported the annual total expense of each firm in salaries. To evaluate business performance we use EBITDA (earnings before interest, taxes, depreciation, and amortization), the value of total assets and the value of total intangible assets. The latter is especially important when analysing startups since their activity is based on generating value through non-physical assets, such as patents and licenses[9]. We use ROA (Return on Assets) as measure of profitability. In order to evaluate financial performance, we report total debt, debt to equity ratio and debt from banks over total revenues. Lastly, we include in the set of dependent variables of interest the cost of research and publishing, which represents an important factor to track the Start Up Act from a research and development perspective.

For each variable, the corresponding unit of measure is displayed in Figure 7.

3.2 Methodology

The research evaluation is based on a counterfactual analysis. Our aim is to find the Average Treatment Effect on the Treated (ATT), namely to compare startups and small and medium-sized firms that applied to the policy with those that did not. The impact of the Start Up Act can be measured by examining what would have happened to treated firms if they did not apply to the policy.

One of the main problems when evaluating the the Start Up Act is that firms register to the policy in different points in time, hindering the possibility to identify a single year in which all the companies in the treatment group start the treatment. We begin by analyzing one static picture of the impact of the Start Up Act to get a general, simplified overview. Then, we add new factors to reach a realistic model.

The first approach is to run a panel fixed-effect estimation which controls for the unobserved heterogeneity across firms. We start by ignoring all the observations of firms that registered to the Start Up Act before and after 2017. The new, reduced panel data has the original control group but considers as treatment group only the enterprises that became innovative exactly in 2017. Using as baseline 2017, we are able to run a standard Difference-in-Differences model following Equation 1. The estimation includes dummy variable $Treat_{i,t}$ which is equal to 1 when a firm is registered to the policy, and dummy variable $After_t$ which displays one whenever the observation is taken in 2017 or after. $Y_{i,t}$ represents a given dependent variable, among the eleven ones presented in paragraph 3.1. Throughout the whole analysis, we consider the logarithm of the outcome variables in order to interpret the coefficients of the regressions as semi-elasticities. γ_i represent the firms’ fixed effect whereas Age_t and $Year_t$ control for firms’ specific age and year. We check the intuition of using the fixed effect instead of a random estimation through the Hausman test reported in Figure 8.

$$\log(Y_{i,t}) = \alpha + \beta_1 Treat_{i,t} + After_t + \gamma_i + Age_t + Year_t + \epsilon_{i,t} \quad (1)$$

We run the same regression considering only the firms that belong to Ateco Codes sectors 62, 63 and 72 in order to verify whether the Start Up Act has different impacts among the distinct segments of the market. We choose these sectors as we think they represent best the technology and scientific sectors and we expect they will display higher growth with respect to other sectors when helped through tax relief and incentives.

Up to now, we considered a reduced version of the original panel data in order to grasp the effect of the Start Up Act only on the firms that became innovative in 2017. A suitable empirical strategy is to restore the original dataset and to control for unobserved heterogeneity across treated and untreated firms through a second panel-fixed effect estimation. Differently from the previous regression, we include all the enterprises that registered to the Start Up Act from 2012 up to 2021. To address the issue of multiple time periods, we include in the model a set of control dummy variables. The estimation is based on Equation 2. $EverTreated_i$ is a time-invariant dummy variable equal to one whenever a firm has registered to the policy at least one year in the sample and $OpenYear_i$ represents a set of dummy variables that controls for the year of establishment of the firms.

$$\begin{aligned} \log(Y_{i,t}) = & \alpha + \beta_1 Treat_{i,t} + \gamma_i + Age_t + Year_t + OpenYear_i * Age_t \\ & + OpenYear_i * EverTreated_i + Age_t * EverTreated_i + \epsilon_{i,t} \end{aligned} \quad (2)$$

An underlying assumption when carrying out a counterfactual analysis is that, in absence of treatment, the difference between the control and the treatment group is constant over time. When downloading data from AIDA, we filtered small and medium-enterprises through requirements as similar as possible to the criteria of the Start Up Act. The aim was to build a control group that matched as close as possible the treatment group in terms of characteristics. After performing some descriptive analysis, we reach the conclusion that firms that apply to the policy in the first place are significantly different from those that do not.

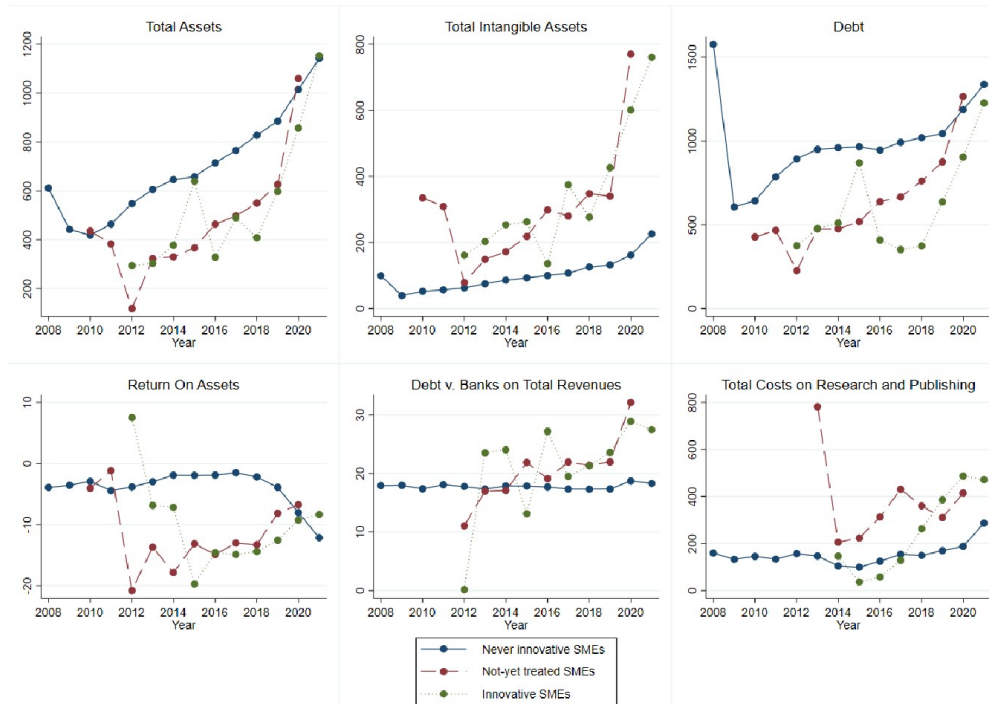


Figure 1: Average trend of the dependent variables for three groups

Figure 1 provides an immediate visual interpretation by displaying the evolution of the mean of 6 of the dependent variables of interest as a function of the years in the sample. The blue solid line corresponds to small and medium-sized enterprises that never registered to the policy. The red dashed line refers to firms that will become innovative in the future, but are not yet in the year considered. The green dotted line represents the trend of innovative SMEs. If we were successful in building a good control group we should see the blue and the red line following similar, parallel trend. As displayed very clearly from Figure 1, it is not the case. In addition, the comparison between not-yet treated firms and never treated ones seems to suggest that the policy selected companies already performing better than the control group.

Looking at figure 1 alone would imply that the Start Up Act does not have positive effects *per se*.

In light of this result, we need to change the control group. The proposed solution is to apply Callaway and Sant’Anna’s (2021) approach. In their own words, they try to construct “Difference-in-Differences methods in the case where there are more than two periods and units can become treated at different points in time—a commonly encountered set up in empirical work in economics”. The aim becomes to find the Average Treatment Effect in period t for the group of units first treated in period g , using as control group the not-yet treated firms. Our analysis focuses on the event study of the dependent variables of interest, which allows to examine the evolution up to 7 years before the registration and up to 6 years after.

4 Results

4.1 The evolution of the number of small and medium-sized enterprises

Figure 2 shows the yearly trend of the number of active small and medium-sized enterprises for each year (right y-axis) and the one of innovative firms through a line (left y-axis).

The number of active SMEs increases from 2008 to 2017 whereas from that year on it suffers a significant drop. The number of innovative firms experiences almost absent growth from the beginning of the policy until 2015. It then registers a steep increase from 2016 until 2020 and it drops smoothly only at the beginning of COVID-19 crisis. These differences in the evolution of innovative and not-innovative firms can be explained by the fact that the Start Up Act required a relatively long time to diffuse as an opportunity for YICs but then demonstrated to provide effective support during the 2020 crisis.

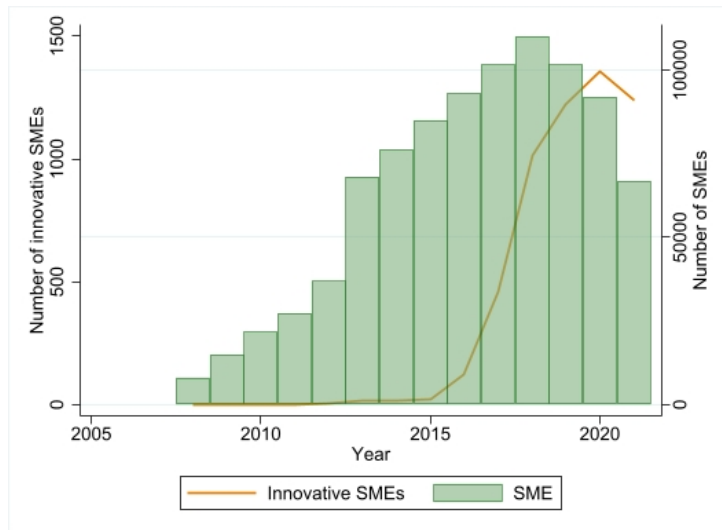


Figure 2: Evolution of numbers of SME enterprises

4.2 The effect of the Start Up Act on firms that registered in 2017

Figure 3 presents the reduced output of the fixed effect estimation using as baseline 2017, as explained in Equation 1 (complete regression in Figure 9). The significant coefficients of the variable of interest $Treat$ display very high values, signaling a beneficial effect of the Start Up Act.

According to this regression, the policy is successful in increasing total intangible assets and total assets respectively around 138% and 91%. Innovative firms display higher credibility and finance their activity through debt around 81% more with respect to non-innovative enterprises. They invest more in their employees providing them wages higher than 92%. These results seem to be too positive to be realistic and should be taken merely as reference. Indeed, Equation 1 provides a static snapshot of the firms that became innovative exactly in 2017, ignoring all the other enterprises that registered to the Start Up Act at any other point in time.

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	-0.0253 (0.1513)	0.5434*** (0.0953)	0.4900** (0.2031)	0.9138*** (0.1430)	1.3752*** (0.1552)	0.8077*** (0.1257)	0.9164*** (0.1405)	-0.1174 (0.2704)	-0.1420 (0.3100)	-0.5302 (0.3849)	0.7095** (0.3583)
After	-0.4517*** (0.1177)	0.1186 (0.1211)	0.5372*** (0.1486)	0.4318*** (0.1303)	-0.4664*** (0.1786)	0.7284*** (0.1153)	1.2195*** (0.0403)	-0.2906*** (0.0394)	-0.3126*** (0.0905)	1.0255*** (0.0989)	-0.7699* (0.4508)
Constant	2.0402*** (0.1174)	1.3398*** (0.1202)	2.7264*** (0.1479)	3.0656*** (0.1290)	2.0874*** (0.1761)	4.2370*** (0.1148)	2.7552*** (0.0360)	1.9933*** (0.0292)	0.2023*** (0.0657)	1.1059*** (0.0727)	3.7182*** (0.3119)
Observations	368,227	369,746	495,580	673,156	539,291	712,515	431,858	385,520	154,185	142,998	8,349
R-squared	0.0073	0.0798	0.0956	0.0637	0.0082	0.1394	0.1736	0.0034	0.0040	0.0170	0.0160
Number of id	86,741	86,581	118,918	140,320	129,268	143,918	94,102	120,109	57,592	54,537	3,988

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 3: Fixed effect estimation using as baseline 2017

Note: control for year and age dummies. Complete regression as in Equation 1

Figure 4 provides the results of Equation 1 for firms that belong to the technology and scientific sector (complete regression in Figure 10). Results show that the Start Up Act has different impacts depending on the industry. Overall, the policy is successful in increasing the level of all the variables analysed in the previous regression. The unique feature of these sectors is the increase around 161% in the amount of money invested in research and publishing, which is in line with expectations.

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	0.2401 (0.2525)	0.4706*** (0.1631)	0.4557 (0.3236)	0.7140*** (0.2235)	1.0045*** (0.2199)	0.5971*** (0.1749)	0.6973*** (0.2289)	-0.2969 (0.6071)	-0.3055 (0.4360)	-1.2158* (0.6662)	1.6147*** (0.4920)
After	-0.0553 (0.0601)	0.5041*** (0.0389)	0.7012*** (0.0845)	0.9066*** (0.0683)	0.6880*** (0.0947)	0.8821*** (0.0547)	1.7879*** (0.1883)	-0.2440 (0.1890)	-0.6460 (0.4869)	0.3262 (0.4988)	-2.4882*** (0.8504)
Constant	1.1123*** (0.1045)	0.7278*** (0.0627)	2.1483*** (0.1447)	1.7273*** (0.0980)	0.9464*** (0.1164)	3.2312*** (0.0905)	2.2636*** (0.1711)	2.0802*** (0.1343)	0.2753 (0.3508)	1.4082*** (0.3433)	5.1767*** (0.6900)
Observations	20,141	20,218	27,103	34,767	28,350	36,826	23,163	19,815	8,022	7,536	494
R-squared	0.0168	0.1582	0.1014	0.0833	0.0211	0.1885	0.2058	0.0052	0.0088	0.0209	0.1467
Number of id	4,644	4,668	6,302	7,257	6,719	7,495	4,861	6,120	2,974	2,851	238

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 4: Fixed effect estimation using as baseline 2017 using Ateco codes 62, 63 and 72

Note: control for year and age dummies. Complete regression as in Equation 1

4.3 The Impact of the Start Up Act using a fixed effect estimation

Figure 5 presents the regression explained in Equation 2 and Figure 11 displays the complete regression. The model suggests that the Start Up Act leads to an increase of around 27% of total assets and 28% of intangible assets. Innovative SMEs finance their activity through debt around 22% more than non-innovative SMEs, signaling a sharp increase of the enterprises' financial credibility. This model includes a set of control variables accounting for the trend of firms ever entering into the policy, namely the fact that firms register to the policy at different points in time. Nonetheless, it compares innovative firms with firms that have never been innovative, which does not represent an accurate control group as shown in Figure 1.

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	0.0149 (0.0559)	0.0480 (0.0370)	-0.0236 (0.0779)	0.2737*** (0.0611)	0.2841*** (0.0705)	0.2158*** (0.0541)	0.1172* (0.0605)	-0.1527* (0.0812)	0.2645** (0.1259)	-0.2191 (0.1417)	0.0545 (0.1599)
Constant	1.8957*** (0.0893)	1.3413*** (0.0835)	2.9952*** (0.1096)	3.2438*** (0.0934)	1.9815*** (0.1212)	4.5961*** (0.0835)	3.1650*** (0.0247)	1.8948*** (0.0182)	0.0781* (0.0414)	1.4783*** (0.0453)	3.3943*** (0.1840)
Observations	371,741	373,293	498,713	679,084	544,950	718,585	435,395	388,234	155,887	144,472	9,015
R-squared	0.0077	0.0878	0.0980	0.0695	0.0177	0.1445	0.1784	0.0037	0.0051	0.0196	0.0579
Number of id	87,581	87,379	119,826	141,493	130,407	145,107	94,917	120,942	58,111	54,999	4,240

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 5: Fixed effect estimation with complete panel data

Note: control for year and age dummies, and interaction terms as in Equation 2

4.4 Difference-in-Difference model in multiple time periods

In this section, we try to assert the effect of the Start Up Act changing the definition of the control group. By using Callaway and Sant’Anna’s approach (2021) [10], we use as comparison group the not-yet treated enterprises rather than the never treated ones. This allows us to study the evolution of economic variables using as baseline the year of registration to the policy for each firm.

Figure 6 presents some of the results of the study event for the dependent variables that display significant pre-and post-average treatment (complete event study from Figure 14 on). An underlying assumption of event studies is that the pre-treatment periods should be constant and close to zero. Hence, it is appropriate to discard from interpretations the evolution of number of employees, cost of labor, and return on assets.

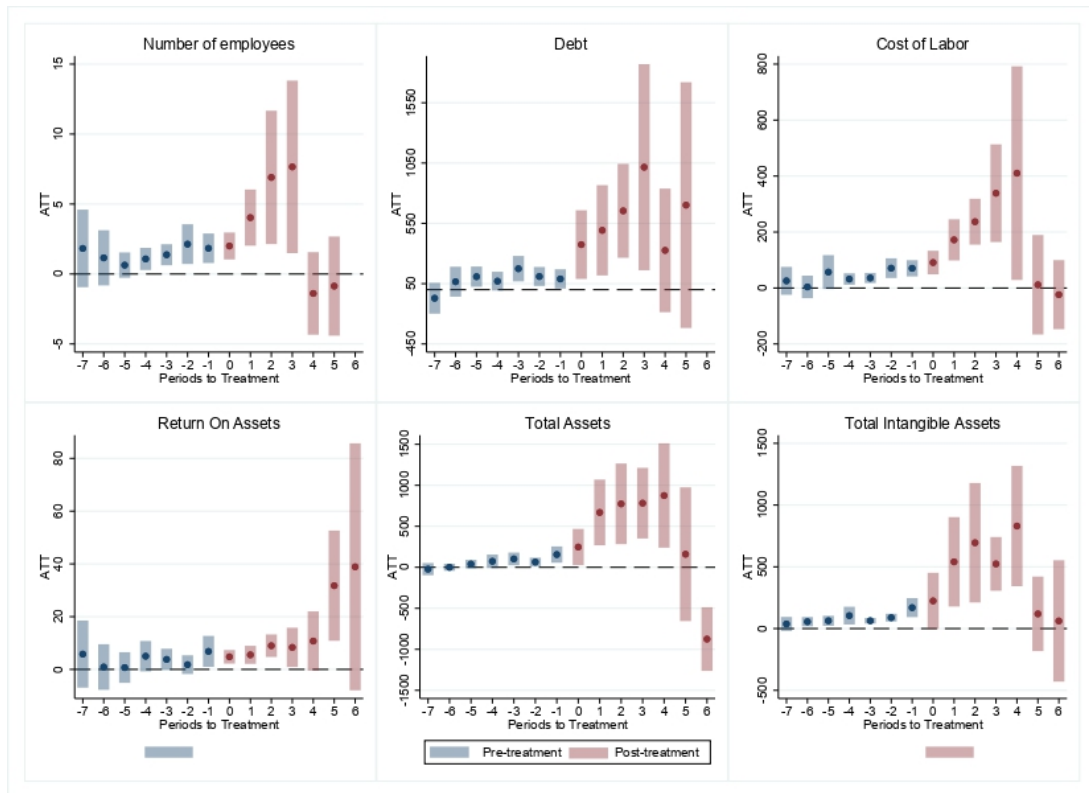


Figure 6: Evolution of numbers of SME enterprises

Results are aligned with expectations. The Start Up Act spurs innovation through high generation of intangible assets. Before the implementation of the policy, startups and small-medium sized companies struggle to finance their activity through debt while registering to the Start Up

Act increases total debt of the business within 4 years. Similar considerations can be done with total assets and total intangible assets. Overall, the Start Up Act has several positive effects as the post-average treatment effect is significantly higher than the pre-average for each of the 11 dependent variables.

A drawback of the policy is that the majority of the variables of interest displays decreasing trend after Year 4, namely after 5 years of participating to the policy. We tried to give an interpretation to this result in the following way. Startups enjoy the advantages of the Start Up Act for a maximum of 5 years after which they can decide to become innovative small and medium-sized enterprises. It simply may be that they decide to exit from the policy without transforming the company. An interesting insight lies on the analysis of the variance which seems to generally increase in the last years. This capture a very common feature of startups and SMEs, namely the “explode or die” phenomenon. Enterprises that enter the policy with a high degree of potential experience an accelerated growth during the treatment period and they are able to sustain the same trend after the end of the advantages. In contrast, the other firms reach positive achievements when receiving incentives from the government but are not be able to uphold the growth further after leaving the policy. These enterprises either close down or incur in financial distress dragging the overall average down.

5 Limitations

The evaluation presents several complexity problems. Limited data may jeopardize our analysis as not all the dependent variables are available to open access and the free ones contain a significant percentage of missing values.

The assumptions we made on how to built the first control group, explained in deep in paragraph 3.1, create a set of enterprises significantly different from the treatment group, as shown in Figure 1. To overcome this issue we perform a Difference-in-Differences analysis using not-yet innovative firms as control group as summarized in Section 4.4.

We perform fixed effect estimations to account for unobservable across treated and untreated firms. We add year dummy variable since, being the policy still active today, SMEs and Startups enter and exit the policy in different years. The treatment group gathers firms that enter the policy in periods characterized by different macroeconomic scenarios and financial markets. The different years of entrance and exit result into an unbalanced panel data.

The enforcement of the policy is on a voluntary basis, namely not all the firms that meet the requirements enter the policy. This leads to a self selection problem. Our analysis also suffers from a reverse causality issue since an innovation shock may contemporaneously induce a firm to take part of the policy and change its growth trajectory. Even though we are aware of these two problems, we are not able to account for their effects.

It is important to be aware of the fact that many other policies have been introduced meanwhile or a few years after the implementation of the Start-up Act. Some of them have the aim of supporting startups and innovative entrepreneurship while others, such as the ones contained in the Salva Italia package, may have affected the overall macroeconomic and social scenario. The presence of multiple policies lead to difficulties in disentangling the actual effect of the Start Up Act. Here there are some examples of the main relevant policies in support of innovative entrepreneurships:

- Smart&Smart Italia represented one of the main financing programs for startups, offering subsidized loans with the aim of covering investment plans and managing costs worth at least EUR 100,000 up to a maximum of EUR 1,5 million.

- Italia Startup Visa and Italia Startup Hub allowed having a new simplified and faster procedure for granting entry visas and self-employment for non EU citizens who wanted to move to Italy and built an innovative startup with a financial availability not lower than EUR 50,000.
- Investor Visa for Italy Promotion of entrepreneurial culture in universities: CLabs. This last term referred to a new teaching method that allows students to be more open to collaboration, develop cross-countries competencies and share their own knowledge with the goal of diversifying their skills.
- Research and Development tax credit has the aim of providing tax incentives available to all companies that experienced an increase in R&D expenses between 2015 and 2020.
- Hyper-depreciation for the purchase of machinery and “industry 4.0”. The ordinary depreciation deduction has consistently increased for investment in 4.0 machinery and technology. leading to a large multiannual tax relief. Therefore, from 2019 the rate of incentives is subject to a four-bracket system which is higher for investments under €2.5 million and progressively decreases up to €20 million.
- Patent Box introduced a facilitation system for income delivery to intellectual property, allowing for a 50% tax break on IP-related income which includes for instance patents, copyrighted software, know-how, and industrial models.
- “Startup sponsor”: transfer of losses of new companies to listed companies
From 2019:
- A new “National Innovation Fund” which is a public venture capital fund with the aim of assisting and helping innovative companies and the national VC market.
- Voucher for “innovation manager” which consists in a non-repayable grant that SMEs can apply for the purchase of specialist consultancy services with the intention of sustaining their digital transformation, for example, through the acquisition of “4.0” technologies.
- Strategies for emerging technologies: artificial intelligence and blockchain. It refers to a various number of initiatives launched by MISE which set up a fund for emerging technologies with the purpose of sustaining artificial intelligence development.

Finally, being the Start Up Act a recent decree law still active today, the time-span of analysis is relatively short [5]. It is possible to analyse the small-medium term effects but not the long ones.

6 Conclusion

The paper aims at evaluating the impact of the Start Up Act through a counterfactual analysis of firms that apply to the policy with respect to those that do not. The first approach is to consider firms that registered to the policy exactly in 2017. We then restore the original panel data and account for different treatment periods through the introduction of a set of control variables. After performing some descriptive analysis we find that enterprises that participate to the Start Up Act are significantly different from those that do not. In light of this finding, we change the definition of the control group, using as comparison the not-yet treated firms. Finally, we perform event studies to analyze the evolution of some balance sheet variables before and after the registration.

The Start Up Act in Lombardy has an overall positive effect, especially in increasing the value of intangible assets, raising investment towards research and publishing and financing their

activity through debt. The research highlights a debatable effect after five years from the implementation of the policy. Some of the dependent variables displays decreasing trends, posing some doubts on the effectiveness of the Start Up Act. The continuous monitoring activity of the program on the portal “Registro Imprese” makes it possible to conduct further and deeper analysis.

On 22 November 2022, InnovUp organized a conference for the 10th-year anniversary of the Start Up Act, during which economic and policy experts summed up the achievements and drawbacks of the policy. They highlighted that fundings granted to innovative enterprises are increasing as well as the fact that it is essential to enhance them further in order to keep up with other European countries. It is very important to improve policies similar to the Start Up Act that aims at creating a favourable environment for innovative enterprises, especially in today-socioeconomic environment. With the words of Luciano Floridi, who intervened during the conference, “digital transition is not only the icing on the cake, but the cake itself”, meaning it is of pivotal importance[11].

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7 Tables and graphs

Variable name	Storage type	Display format	Value label	Variable label
id	float	%9.0g		Identification code (number)
codice_fiscale	str11	%11s		Fiscal code (number)
ateco	byte	%10.0g		Ateco code 2007 (number)
EverTreated	byte	%10.0g		Dummy variable (dummy)
anno_ap	int	%10.0g		Opening year (year)
anno_ch	int	%10.0g		Closing year (year)
age	byte	%10.0g		Age (number)
anno_relativo	byte	%10.0g		Realtive year (number)
Post	byte	%10.0g		Dummy variable (dummy)
dip	int	%10.0g		Number of employees (number)
ebitda	double	%10.0g		Ebitda (kEuros)
renddip	double	%10.0g		Labor productivity (number)
totass	double	%10.0g		Total assets (kEuros)
totintang	double	%10.0g		Total intangibles assets (kEuros)
debt	double	%10.0g		Total debt (kEuros)
income	double	%10.0g		Cost of labor (kEuros)
rda	double	%10.0g		Return on Assets (%)
d_e	double	%10.0g		Debt to equity ratio (%)
db_fatt	double	%10.0g		Debts v. banks on total revenues (%)
ric	double	%10.0g		Total costs of research and publishing (kEuros)
Year	float	%9.0g		Year (year)
Group	float	%9.0g		Year of innovation (year)

Figure 7: Description of the variables contained in the panel data

Test of H0: Difference in coefficients not systematic

$$\begin{aligned} \text{chi2}(26) &= (\mathbf{b}-\mathbf{B})'[(\mathbf{V}_b-\mathbf{V}_B)^{-1}](\mathbf{b}-\mathbf{B}) \\ &= 2572.69 \end{aligned}$$

Prob > chi2 = 0.0000

(V_b-V_B is not positive definite)

Figure 8: Hausman Test for number of employees

Note: Similar results for the other dependent variables

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	-0.0253 (0.1513)	0.5434*** (0.0953)	0.4900** (0.2031)	0.9138*** (0.1430)	1.3752*** (0.1552)	0.8077*** (0.1257)	0.9164*** (0.1405)	-0.1174 (0.2704)	-0.1420 (0.3100)	-0.5302 (0.3849)	0.7095** (0.3583)
After	-0.4517*** (0.1177)	0.1186 (0.1211)	0.5372*** (0.1486)	0.4318*** (0.1303)	-0.4664*** (0.1786)	0.7284*** (0.1153)	1.2195*** (0.0403)	-0.2906*** (0.0394)	-0.3126*** (0.0905)	1.0255*** (0.0989)	-0.7699* (0.4508)
2009	-0.2759** (0.1198)	-0.1514 (0.1097)	-0.2989** (0.1517)	-0.2072 (0.1326)	-0.4748*** (0.1777)	-0.3067*** (0.1189)	-0.0574* (0.0312)	-0.0031 (0.0235)	-0.0268 (0.0459)	0.0492 (0.0524)	-0.2126* (0.1254)
2010	-0.3313*** (0.1202)	0.0018 (0.1229)	-0.2634* (0.1525)	-0.2745** (0.1326)	-0.5047*** (0.1785)	-0.2789** (0.1187)	0.0050 (0.0344)	-0.0283 (0.0261)	-0.0330 (0.0537)	0.1482** (0.0604)	-0.3832* (0.1970)
2011	-0.2958** (0.1199)	-0.1227 (0.1233)	-0.1307 (0.1518)	-0.2558* (0.1324)	-0.5167*** (0.1786)	-0.1560 (0.1184)	0.0693* (0.0358)	-0.0559** (0.0279)	-0.0252 (0.0596)	0.3290*** (0.0668)	-0.3756 (0.2312)
2012	-0.3124*** (0.1196)	-0.2881** (0.1233)	-0.0572 (0.1513)	-0.3002** (0.1321)	-0.5464*** (0.1786)	-0.1099 (0.1179)	0.0776** (0.0371)	-0.0809*** (0.0296)	-0.0587 (0.0650)	0.3770*** (0.0721)	-0.3840 (0.2794)
2013	-0.3586*** (0.1194)	-0.3344*** (0.1231)	-0.1253 (0.1509)	-0.3533*** (0.1318)	-0.5708*** (0.1785)	-0.0845 (0.1176)	0.0702* (0.0379)	-0.0982*** (0.0309)	-0.0671 (0.0696)	0.4552*** (0.0768)	-0.5659* (0.3206)
2014	-0.3761*** (0.1190)	-0.3162*** (0.1228)	-0.1010 (0.1503)	-0.3284** (0.1314)	-0.5993*** (0.1783)	-0.0289 (0.1171)	0.1422*** (0.0384)	-0.1250*** (0.0321)	-0.1102 (0.0728)	0.5165*** (0.0801)	-0.5827* (0.3438)
2015	-0.3638*** (0.1187)	-0.2801** (0.1224)	-0.0150 (0.1498)	-0.2792** (0.1310)	-0.6207*** (0.1781)	0.0482 (0.1166)	0.2340*** (0.0388)	-0.1500*** (0.0333)	-0.1524** (0.0758)	0.5520*** (0.0833)	-0.6883* (0.3627)
2016	-0.3447*** (0.1184)	-0.1976 (0.1222)	0.0890 (0.1494)	-0.1955 (0.1308)	-0.6176*** (0.1781)	0.1368 (0.1162)	0.4855*** (0.0391)	-0.1832*** (0.0344)	-0.1943** (0.0789)	0.5798*** (0.0866)	-0.7468* (0.3824)
2017	0.0618*** (0.0115)	-0.2563*** (0.0090)	-0.3721*** (0.0163)	-0.5293*** (0.0157)	-0.1594*** (0.0190)	-0.4873*** (0.0138)	-0.5637*** (0.0075)	0.0839*** (0.0106)	0.0611*** (0.0233)	-0.4259*** (0.0256)	-0.0601 (0.1078)
2018	0.0511*** (0.0089)	-0.1904*** (0.0070)	-0.2565*** (0.0127)	-0.3994*** (0.0122)	-0.1281*** (0.0148)	-0.3655*** (0.0106)	-0.3966*** (0.0063)	0.0532*** (0.0090)	0.0048 (0.0196)	-0.3676*** (0.0213)	-0.0809 (0.0836)
2019	0.0310*** (0.0065)	-0.1237*** (0.0050)	-0.1294*** (0.0093)	-0.2680*** (0.0088)	-0.0935*** (0.0107)	-0.2524*** (0.0076)	-0.2274*** (0.0054)	0.0072 (0.0080)	-0.0265 (0.0166)	-0.3392*** (0.0181)	-0.0286 (0.0642)
2020	-0.0121*** (0.0042)	-0.0477*** (0.0031)	-0.0455*** (0.0065)	-0.1456*** (0.0054)	-0.0626*** (0.0069)	-0.1403*** (0.0046)	-0.2947*** (0.0044)	-0.0354*** (0.0073)	0.0234* (0.0128)	-0.0869*** (0.0141)	-0.0003 (0.0476)
2021	-	-	-	-	-	-	-	-	-	-	-
1-year	0.0425 (0.0306)	0.0370 (0.0237)	-0.2466*** (0.0426)	0.0693* (0.0399)	0.2195*** (0.0436)	-0.1350*** (0.0370)	0.9152*** (0.0079)	-0.0040 (0.0065)	-0.0134 (0.0126)	0.0027 (0.0146)	-0.0350 (0.0484)
2-year	0.0600** (0.0283)	0.1562*** (0.0221)	0.3771*** (0.0394)	0.5304*** (0.0369)	0.3521*** (0.0406)	0.5640*** (0.0342)	1.0137*** (0.0086)	-0.0078 (0.0081)	-0.0114 (0.0174)	0.0117 (0.0196)	-0.1211 (0.0790)
3-year	0.0566** (0.0259)	0.2077*** (0.0203)	0.5192*** (0.0362)	0.6593*** (0.0340)	0.3020*** (0.0377)	0.7265*** (0.0313)	0.9981*** (0.0089)	-0.0020 (0.0096)	-0.0231 (0.0216)	-0.0108 (0.0239)	-0.1450 (0.1029)
4-year	0.0470** (0.0236)	0.2131*** (0.0186)	0.5493*** (0.0330)	0.6529*** (0.0312)	0.1299*** (0.0350)	0.7687*** (0.0285)	0.9326*** (0.0095)	-0.0110 (0.0114)	-0.0208 (0.0261)	0.0313 (0.0286)	-0.1713 (0.1271)
5-year	0.0343 (0.0213)	0.2088*** (0.0169)	0.5435*** (0.0299)	0.6230*** (0.0286)	0.1039*** (0.0329)	0.7547*** (0.0258)	0.8587*** (0.0101)	-0.0058 (0.0133)	0.0015 (0.0306)	0.0349 (0.0334)	-0.1625 (0.1470)
6-year	0.0235 (0.0192)	0.1957*** (0.0153)	0.4904*** (0.0271)	0.5741*** (0.0263)	0.1769*** (0.0313)	0.7091*** (0.0232)	0.7598*** (0.0108)	-0.0127 (0.0152)	-0.0151 (0.0352)	0.0426 (0.0382)	-0.1266 (0.1714)
7-year	0.0159 (0.0172)	0.1767*** (0.0139)	0.4262*** (0.0245)	0.5105*** (0.0242)	0.2096*** (0.0302)	0.6425*** (0.0208)	0.6644*** (0.0117)	-0.0021 (0.0171)	-0.0151 (0.0394)	0.0756* (0.0428)	-0.0502 (0.1906)
8-year	0.0096 (0.0154)	0.1499*** (0.0126)	0.3779*** (0.0223)	0.4287*** (0.0224)	0.2080*** (0.0294)	0.5564*** (0.0186)	0.5485*** (0.0126)	0.0104 (0.0190)	-0.0133 (0.0433)	0.0463 (0.0471)	-0.0018 (0.2095)
9-year	0.0118 (0.0138)	0.1322*** (0.0115)	0.3000*** (0.0205)	0.3500*** (0.0212)	0.1650*** (0.0293)	0.4606*** (0.0167)	0.4436*** (0.0135)	0.0184 (0.0207)	-0.0333 (0.0469)	0.0520 (0.0508)	-0.0820 (0.2284)
10-year	-0.0004 (0.0126)	0.0999*** (0.0106)	0.2241*** (0.0192)	0.2606*** (0.0201)	0.1271*** (0.0294)	0.3531*** (0.0150)	0.3421*** (0.0143)	0.0179 (0.0223)	-0.0563 (0.0502)	0.0157 (0.0544)	-0.0709 (0.2325)
11-year	0.0053 (0.0116)	0.0689*** (0.0099)	0.1484*** (0.0185)	0.1772*** (0.0191)	0.1174*** (0.0288)	0.2416*** (0.0136)	0.2255*** (0.0150)	0.0125 (0.0239)	-0.0728 (0.0513)	0.0333 (0.0564)	-0.1277 (0.2201)
12-year	0.0114 (0.0107)	0.0289*** (0.0086)	0.0892*** (0.0185)	0.0700*** (0.0175)	0.0566** (0.0267)	0.1272*** (0.0119)	0.1249*** (0.0143)	0.0096 (0.0254)	0.0486 (0.0468)	0.0643 (0.0523)	-0.1103 (0.1877)
13-year	-	-	-	-	-	-	-	-	-	-	-
Constant	2.0402*** (0.1174)	1.3398*** (0.1202)	2.7264*** (0.1479)	3.0656*** (0.1290)	2.0874*** (0.1761)	4.2370*** (0.1148)	2.7552*** (0.0360)	1.9933*** (0.0292)	0.2023*** (0.0657)	1.1059*** (0.0727)	3.7182*** (0.3119)
Observations	368,227	369,746	495,580	673,156	539,291	712,515	431,858	385,520	154,185	142,998	8,349
R-squared	0.0073	0.0798	0.0956	0.0637	0.0082	0.1394	0.1736	0.0034	0.0040	0.0170	0.0160
Number of id	86,741	86,581	118,918	140,320	129,268	143,918	94,102	120,109	57,592	54,537	3,988

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 9: Fixed effect estimation using as baseline 2017

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	0.2401 (0.2525)	0.4706*** (0.1631)	0.4557 (0.3236)	0.7140*** (0.2235)	1.0045*** (0.2199)	0.5971*** (0.1749)	0.6973*** (0.2289)	-0.2969 (0.6071)	-0.3055 (0.4360)	-1.2158* (0.6662)	1.6147*** (0.4920)
After	-0.0553 (0.0601)	0.5041*** (0.0389)	0.7012*** (0.0845)	0.9066*** (0.0683)	0.6880*** (0.0947)	0.8821*** (0.0547)	1.7879*** (0.1883)	-0.2440 (0.1890)	-0.6460 (0.4869)	0.3262 (0.4988)	-2.4882*** (0.8504)
2009	0.3321** (0.1598)	-0.0213 (0.1473)	-0.3147* (0.1911)	-0.6196*** (0.1636)	-0.4080** (0.1832)	-0.6415*** (0.1448)	0.3177** (0.1608)	-0.0457 (0.1150)	0.3340 (0.2315)	0.2009 (0.2496)	-0.5611*** (0.1695)
2010	0.1315 (0.0987)	0.0045 (0.1384)	-0.3893*** (0.1368)	-0.6403*** (0.1242)	-0.4667*** (0.1535)	-0.6080*** (0.1036)	0.3073* (0.1678)	-0.1772 (0.1170)	-0.0766 (0.2912)	-0.1927 (0.3125)	-1.3225*** (0.1932)
2011	0.0459 (0.0786)	-0.1049 (0.1034)	-0.4082*** (0.1095)	-0.4827*** (0.1007)	-0.4125*** (0.1257)	-0.6321*** (0.0838)	0.3797** (0.1698)	-0.2100* (0.1221)	-0.1013 (0.3205)	0.1094 (0.3172)	-1.6207*** (0.3074)
2012	0.0328 (0.0621)	-0.2138*** (0.0439)	-0.3025*** (0.0830)	-0.3924*** (0.0786)	-0.3710*** (0.0997)	-0.5284*** (0.0643)	0.3696** (0.1765)	-0.2152 (0.1339)	-0.0395 (0.3502)	0.1411 (0.3325)	-1.8765*** (0.5587)
2013	0.0354 (0.0444)	-0.2740*** (0.0330)	-0.2852*** (0.0611)	-0.3419*** (0.0560)	-0.2292*** (0.0727)	-0.4203*** (0.0445)	0.4680*** (0.1778)	-0.1568 (0.1382)	-0.0693 (0.3634)	0.2515 (0.3523)	-2.1003*** (0.7022)
2014	-0.0243 (0.0342)	-0.2112*** (0.0250)	-0.2129*** (0.0437)	-0.2420*** (0.0408)	-0.1630*** (0.0524)	-0.3055*** (0.0332)	0.5436*** (0.1794)	-0.1702 (0.1449)	-0.2180 (0.3814)	0.1995 (0.3700)	-1.9178** (0.7713)
2015	0.0219 (0.0246)	-0.1392*** (0.0152)	-0.0868*** (0.0296)	-0.1417*** (0.0254)	-0.1003*** (0.0316)	-0.1408*** (0.0224)	0.6366*** (0.1806)	-0.2084 (0.1513)	-0.3611 (0.3919)	0.2481 (0.3909)	-1.8555** (0.8320)
2016	-	-	-	-	-	-	0.9331*** (0.1823)	-0.1578 (0.1577)	-0.4858 (0.4089)	0.0703 (0.4100)	-1.7541* (0.8918)
2017	-0.0232 (0.0495)	-0.4190*** (0.0319)	-0.6263*** (0.0692)	-0.7652*** (0.0555)	-0.5874*** (0.0768)	-0.7101*** (0.0443)	-0.6981*** (0.0332)	0.0001 (0.0520)	0.2002 (0.1237)	-0.2180 (0.1337)	0.2197 (0.3285)
2018	-0.0288 (0.0396)	-0.3421*** (0.0257)	-0.4290*** (0.0543)	-0.5941*** (0.0444)	-0.4722*** (0.0616)	-0.5274*** (0.0353)	-0.5516*** (0.0281)	-0.0159 (0.0433)	0.0572 (0.0998)	-0.1833* (0.1071)	-0.0123 (0.3755)
2019	0.0087 (0.0287)	-0.2469*** (0.0185)	-0.2467*** (0.0395)	-0.4148*** (0.0333)	-0.3387*** (0.0461)	-0.3426*** (0.0262)	-0.3732*** (0.0241)	-0.0063 (0.0363)	-0.0389 (0.0777)	-0.2676*** (0.0869)	0.1412 (0.3850)
2020	-0.0216 (0.0195)	-0.1303*** (0.0117)	-0.1343*** (0.0271)	-0.2044*** (0.0226)	-0.1941*** (0.0305)	-0.1969*** (0.0173)	-0.2607*** (0.0192)	-0.0653** (0.0320)	0.0025 (0.0591)	-0.0438 (0.0675)	0.3755 (0.4116)
2021	-	-	-	-	-	-	-	-	-	-	-
1-year	0.2614** (0.1322)	0.2005*** (0.0762)	0.2254 (0.1807)	0.5839*** (0.1155)	0.8256*** (0.1294)	0.2727** (0.1109)	0.8191*** (0.0361)	0.0161 (0.0283)	0.0159 (0.0563)	0.0983 (0.0664)	0.1293 (0.1526)
2-year	0.2550** (0.1217)	0.3294*** (0.0719)	0.6983*** (0.1671)	0.9300*** (0.1076)	0.9375*** (0.1225)	0.8420*** (0.1021)	0.9609*** (0.0379)	0.0048 (0.0364)	0.0644 (0.0822)	0.1758* (0.0919)	0.2759 (0.2008)
3-year	0.2012* (0.1115)	0.3824*** (0.0665)	0.8032*** (0.1532)	1.0314*** (0.1008)	0.8627*** (0.1179)	0.9570*** (0.0943)	0.9939*** (0.0394)	-0.0184 (0.0448)	0.0963 (0.1056)	0.1719 (0.1171)	0.0567 (0.2518)
4-year	0.1936* (0.1019)	0.4014*** (0.0616)	0.7982*** (0.1398)	0.9617*** (0.0954)	0.6315*** (0.1156)	0.9807*** (0.0867)	1.0081*** (0.0418)	-0.0616 (0.0549)	0.0883 (0.1331)	0.1872 (0.1465)	-0.3273 (0.5058)
5-year	0.1465 (0.0915)	0.3778*** (0.0566)	0.7972*** (0.1267)	0.8875*** (0.0921)	0.5463*** (0.1175)	0.9264*** (0.0799)	0.9405*** (0.0450)	-0.0277 (0.0640)	0.0688 (0.1572)	0.2398 (0.1728)	-0.1986 (0.4399)
6-year	0.1285 (0.0820)	0.3740*** (0.0527)	0.7441*** (0.1151)	0.7866*** (0.0906)	0.5675*** (0.1228)	0.8622*** (0.0737)	0.8416*** (0.0488)	-0.0762 (0.0758)	0.2247 (0.1842)	0.2577 (0.2043)	-0.4138 (0.5016)
7-year	0.1066 (0.0728)	0.3515*** (0.0492)	0.6738*** (0.1040)	0.6846*** (0.0908)	0.5278*** (0.1298)	0.7894*** (0.0684)	0.7702*** (0.0521)	-0.1125 (0.0857)	0.3153 (0.2138)	0.5639** (0.2289)	-0.2582 (0.4833)
8-year	0.0998 (0.0637)	0.2934*** (0.0459)	0.5675*** (0.0951)	0.6201*** (0.0915)	0.4813*** (0.1391)	0.6957*** (0.0643)	0.6463*** (0.0571)	-0.0846 (0.0964)	0.3297 (0.2386)	0.6178** (0.2553)	-0.3443 (0.4912)
9-year	0.0702 (0.0557)	0.2503*** (0.0438)	0.4985*** (0.0877)	0.5845*** (0.0935)	0.4774*** (0.1462)	0.6101*** (0.0615)	0.5055*** (0.0609)	-0.1126 (0.1075)	0.3422 (0.2534)	0.5631** (0.2767)	-0.9011 (0.6605)
10-year	0.0660 (0.0499)	0.1644*** (0.0429)	0.3517*** (0.0835)	0.3710*** (0.0955)	0.3466** (0.1547)	0.4582*** (0.0601)	0.4134*** (0.0631)	-0.1313 (0.1167)	0.4235 (0.2842)	0.4063 (0.3117)	-0.5166 (0.5477)
11-year	0.0627 (0.0467)	0.1051** (0.0414)	0.2137*** (0.0795)	0.2415** (0.0981)	0.2591 (0.1612)	0.2938*** (0.0569)	0.2913*** (0.0647)	-0.0487 (0.1257)	0.5817* (0.2975)	0.5821* (0.3162)	-0.0490 (0.4014)
12-year	0.0777* (0.0417)	0.0497 (0.0388)	0.0739 (0.0786)	0.1012 (0.0922)	0.1244 (0.1445)	0.1423*** (0.0522)	0.2087*** (0.0624)	-0.0555 (0.1269)	0.3914 (0.2837)	0.3056 (0.3208)	0.0613 (0.4112)
13-year	-	-	-	-	-	-	-	-	-	-	-
Constant	1.1123*** (0.1045)	0.7278*** (0.0627)	2.1483*** (0.1447)	1.7273*** (0.0980)	0.9464*** (0.1164)	3.2312*** (0.0905)	2.2636*** (0.1711)	2.0802*** (0.1343)	0.2753 (0.3508)	1.4082*** (0.3433)	5.1767*** (0.6900)
Observations	20,141	20,218	27,103	34,767	28,350	36,826	23,163	19,815	8,022	7,536	494
R-squared	0.0168	0.1582	0.1014	0.0833	0.0211	0.1885	0.2058	0.0052	0.0088	0.0209	0.1467
Number of id	4,644	4,668	6,302	7,257	6,719	7,495	4,861	6,120	2,974	2,851	238

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Figure 10: Fixed effect estimation using as baseline 2017 considering Ateco sectors 62,63 and 72

VARIABLES (log)	Labor Productivity	Number of employees	Ebitda	Total Assets	Total Intangible Assets	Debt	Cost of labor	Return on Assets	Debt to Equity ratio	Debt v. banks on Total Revenues	Research and publishing
Treat	0.0149	0.0480	-0.0236	0.2737***	0.2841***	0.2158***	0.1172*	-0.1527*	0.2645**	-0.2191	0.0545
	(0.0559)	(0.0370)	(0.0779)	(0.0611)	(0.0705)	(0.0541)	(0.0605)	(0.0812)	(0.1259)	(0.1417)	(0.1599)
1-year	-0.0684	-0.0655	-0.1926	-0.2184**	-0.1549*	-0.1832**	0.9968***	-0.0171	-0.0061	0.1166**	-0.1703
	(0.1235)	(0.0771)	(0.1290)	(0.0887)	(0.0894)	(0.0909)	(0.0232)	(0.0203)	(0.0441)	(0.0493)	(0.1460)
2-year	-0.0558	0.1029	0.4698***	0.3523***	-0.0399	0.6017***	1.2103***	-0.0312	-0.0255	0.2208***	-0.3728
	(0.1069)	(0.0695)	(0.1130)	(0.0819)	(0.0849)	(0.0824)	(0.0313)	(0.0325)	(0.0696)	(0.0775)	(0.2307)
3-year	-0.0793	0.1692***	0.6576***	0.5723***	-0.1020	0.8190***	1.2895***	-0.0516	-0.0811	0.2360***	-0.4857*
	(0.0913)	(0.0634)	(0.0988)	(0.0763)	(0.0841)	(0.0747)	(0.0323)	(0.0369)	(0.0747)	(0.0830)	(0.2729)
4-year	-0.1307*	0.1932***	0.7225***	0.6464***	-0.2918***	0.9297***	1.2965***	-0.1092***	-0.1623**	0.3118***	-0.6017**
	(0.0793)	(0.0607)	(0.0882)	(0.0737)	(0.0882)	(0.0701)	(0.0292)	(0.0356)	(0.0684)	(0.0763)	(0.2437)
5-year	-0.1745**	0.2134***	0.7672***	0.7240***	-0.2613***	0.9974***	1.3136***	-0.1478***	-0.1347**	0.4094***	-0.6147***
	(0.0742)	(0.0630)	(0.0847)	(0.0766)	(0.0975)	(0.0707)	(0.0261)	(0.0303)	(0.0604)	(0.0673)	(0.2349)
6-year	-0.2051***	0.2228***	0.7294***	0.7944***	-0.0466	1.0254***	1.3141***	-0.1562***	-0.1520***	0.4939***	-0.4837**
	(0.0776)	(0.0700)	(0.0895)	(0.0843)	(0.1098)	(0.0767)	(0.0244)	(0.0227)	(0.0526)	(0.0569)	(0.2430)
7-year	-0.3127**	0.0800	0.6297***	0.6746***	-0.1973	0.9629***	1.4358***	-0.1400***	-0.1694*	0.5992***	-0.7426**
	(0.1218)	(0.1073)	(0.1560)	(0.1393)	(0.1771)	(0.1444)	(0.0425)	(0.0414)	(0.0911)	(0.1015)	(0.3668)
8-year	-0.1560	0.1168	0.7503***	0.8854***	-0.2170	1.1946***	1.4248***	-0.1137**	-0.1682*	0.7039***	-0.1076
	(0.1570)	(0.1205)	(0.1907)	(0.1604)	(0.1699)	(0.1540)	(0.0456)	(0.0472)	(0.1022)	(0.1138)	(0.4040)
9-year	-0.2061	0.0915	0.5248***	0.5057***	-0.4559***	0.9090***	1.2615***	-0.1760***	-0.3554***	0.6301***	-0.5616
	(0.1545)	(0.1120)	(0.1746)	(0.1379)	(0.1688)	(0.1289)	(0.0517)	(0.0524)	(0.1162)	(0.1278)	(0.4600)
10-year	-0.4136***	0.0911	0.5834***	0.3590***	-0.5903***	0.8148***	1.2496***	-0.1877***	-0.3232***	0.7969***	-0.7192
	(0.1161)	(0.1056)	(0.1377)	(0.1153)	(0.1508)	(0.1047)	(0.0422)	(0.0449)	(0.1022)	(0.1117)	(0.4420)
11-year	-0.3766***	0.1091	0.5519***	0.3842***	-0.5740***	0.8063***	1.2143***	-0.2599***	-0.3122***	0.9102***	-0.9039*
	(0.1114)	(0.1093)	(0.1362)	(0.1174)	(0.1578)	(0.1050)	(0.0421)	(0.0439)	(0.1015)	(0.1105)	(0.4689)
12-year	-0.3869***	0.0639	0.5395***	0.3985***	-0.5857***	0.7584***	1.2876***	-0.2239***	-0.3456***	1.0524***	-0.9609*
	(0.1123)	(0.1157)	(0.1402)	(0.1232)	(0.1681)	(0.1091)	(0.0441)	(0.0449)	(0.1076)	(0.1147)	(0.5185)
13-year	-0.4411***	0.0605	0.5129***	0.4705***	-0.5388***	0.7191***	1.2372***	-0.2887***	-0.3171***	1.0223***	-0.7891
	(0.1187)	(0.1242)	(0.1495)	(0.1320)	(0.1815)	(0.1165)	(0.0470)	(0.0476)	(0.1161)	(0.1246)	(0.5855)
2009	-0.1653	-0.0840	-0.3535*	0.0754	-0.1035	-0.2647*	-0.1381***	0.0044	-0.0474	-0.0678	-0.0009
	(0.1634)	(0.1247)	(0.1863)	(0.1465)	(0.1820)	(0.1385)	(0.0363)	(0.0300)	(0.0613)	(0.0692)	(0.1872)
2010	-0.2230	0.1019	-0.3426**	-0.1012	-0.1025	-0.3083**	-0.2107***	0.0043	-0.0116	-0.0510	-0.2463
	(0.1447)	(0.1237)	(0.1670)	(0.1338)	(0.1674)	(0.1255)	(0.0431)	(0.0406)	(0.0847)	(0.0948)	(0.3020)
2011	-0.1686	0.0037	-0.2658*	-0.1812	-0.1070	-0.2402**	-0.2236***	-0.0245	0.0544	0.0881	-0.1570
	(0.1258)	(0.1119)	(0.1467)	(0.1212)	(0.1535)	(0.1123)	(0.0434)	(0.0448)	(0.0899)	(0.1012)	(0.3190)
2012	-0.1086	-0.3322***	-0.2239*	-0.3103***	-0.1374	-0.2673***	-0.2743***	0.0510	0.1131	0.1232	-0.1549
	(0.1079)	(0.0976)	(0.1275)	(0.1088)	(0.1401)	(0.0997)	(0.0397)	(0.0437)	(0.0871)	(0.0969)	(0.3122)
2013	-0.1299	-0.3876***	-0.3737***	-0.4322***	-0.1754	-0.3358***	-0.3585***	0.0491	0.0581	0.0461	-0.1450
	(0.0935)	(0.0866)	(0.1109)	(0.0987)	(0.1294)	(0.0897)	(0.0333)	(0.0375)	(0.0752)	(0.0850)	(0.2983)
2014	-0.1420*	-0.3980***	-0.3559***	-0.5004***	-0.3940***	-0.3524***	-0.3727***	0.0069	0.0156	0.0162	-0.2231
	(0.0843)	(0.0779)	(0.0985)	(0.0917)	(0.1203)	(0.0831)	(0.0272)	(0.0251)	(0.0583)	(0.0631)	(0.2686)
2015	-0.0439	-0.2333**	-0.2495*	-0.3815**	-0.2542	-0.2876**	-0.4829***	-0.0318	0.0011	0.0014	-0.0662
	(0.1170)	(0.1015)	(0.1501)	(0.1548)	(0.1694)	(0.1406)	(0.0390)	(0.0358)	(0.0812)	(0.0908)	(0.3251)
2016	-0.1847	-0.2192**	-0.3057*	-0.6060***	-0.2881**	-0.5071***	-0.3628***	-0.0510	-0.0789	-0.1842**	-0.7029**
	(0.1461)	(0.1046)	(0.1765)	(0.1470)	(0.1452)	(0.1433)	(0.0386)	(0.0385)	(0.0812)	(0.0902)	(0.2970)
2017	-0.1659	-0.1523*	-0.0767	-0.2100*	-0.1051	-0.2156**	-0.1566***	-0.0010	0.0276	-0.0186	-0.1445
	(0.1356)	(0.0811)	(0.1479)	(0.1107)	(0.1258)	(0.1066)	(0.0421)	(0.0416)	(0.0878)	(0.0988)	(0.3295)
2018	0.0298	-0.1319**	-0.0989	-0.0288	0.0117	-0.1112*	-0.0926***	-0.0056	-0.0413	-0.1219*	-0.2029
	(0.0765)	(0.0531)	(0.0833)	(0.0625)	(0.0714)	(0.0604)	(0.0242)	(0.0275)	(0.0552)	(0.0622)	(0.2069)
2019	-0.0154	-0.1090***	-0.0272	-0.0224	0.0095	-0.0971**	-0.0158	-0.0458**	-0.0793**	-0.1707***	-0.0413
	(0.0514)	(0.0356)	(0.0558)	(0.0416)	(0.0477)	(0.0403)	(0.0157)	(0.0185)	(0.0359)	(0.0400)	(0.1236)
2020	-0.0444*	-0.0289	0.0112	-0.0095	0.0097	-0.0518**	-0.2137***	-0.0742***	0.0082	-0.0193	0.0350
	(0.0262)	(0.0182)	(0.0287)	(0.0216)	(0.0245)	(0.0208)	(0.0100)	(0.0120)	(0.0229)	(0.0258)	(0.0782)
2021	-	-	-	-	-	-	-	-	-	-	-
2009_1-year	0.1111	-0.3342**	-0.1467	0.0523	-0.1228	-0.4114***	0.0667	-0.0212	-0.0863	-0.0622	0.4133
	(0.1697)	(0.1309)	(0.2116)	(0.1681)	(0.1734)	(0.1474)	(0.0461)	(0.0412)	(0.0781)	(0.0896)	(0.3068)
2009_2-year	0.0756	-0.2743**	-0.0734	0.0472	-0.0990	-0.4309***	0.0312	-0.0049	-0.0754	-0.0692	0.5894*
	(0.1708)	(0.1327)	(0.2128)	(0.1704)	(0.1755)	(0.1487)	(0.0533)	(0.0483)	(0.1005)	(0.1143)	(0.3523)
2009_3-year	0.0121	0.0192	-0.1218	0.0466	-0.0578	-0.3805**	-0.0404	-0.0844	-0.1884	-0.0622	0.6701
	(0.1721)	(0.1347)	(0.2143)	(0.1723)	(0.1773)	(0.1503)	(0.0600)	(0.0551)	(0.1225)	(0.1368)	(0.5926)
2009_4-year	0.0469	0.0296	-0.0316	0.0027	-0.0240	-0.3734**	-0.0515	-0.0711	-0.0416	-0.0161	0.5392
	(0.1726)	(0.1355)	(0.2152)	(0.1741)	(0.1794)	(0.1514)	(0.0637)	(0.0604)	(0.1373)	(0.1531)	(0.7049)
2009_5-year	0.0657	0.0194	-0.0920	-0.0149	0.0927	-0.3820**	-0.0471	-0.0173	-0.0347	0.0394	0.7433
	(0.1729)	(0.1360)	(0.2158)	(0.1750)	(0.1812)	(0.1522)	(0.0656)	(0.0641)	(0.1446)	(0.1617)	(0.7575)
2009_6-year	-0.0061	-0.1275	-0.1347	-0.2136	-0.2186	-0.4334*	0.0741	0.0022	-0.1515	-0.0294	-0.0176
	(0.2290)	(0.1786)	(0.2736)	(0.2535)	(0.2682)	(0.2290)	(0.0772)	(0.0730)	(0.1679)	(0.1893)	(0.8746)
2009_7-year	0.2324	0.0599	0.0761	0.1337	-0.0153	-0.1280	-0.0368	0.0347	-0.0862	0.0760	0.9488
	(0.2238)	(0.1747)	(0.2922)	(0.2440)	(0.2486)	(0.2227)	(0.0779)	(0.0726)	(0.1663)	(0.1886)	(0.8893)
2009_8-year	0.0367	0.0054	-0.2386	-0.4527**	-0.1878	-0.6236***	-0.1664**	-0.0865	-0.2962*	-0.2179	-0.3235
	(0.2438)	(0.1671)	(0.2855)	(0.2298)	(0.2284)	(0.2114)	(0.0796)	(0.0736)	(0.1721)	(0.1953)	(0.9660)
2009_9-year	-0.1238	0.0509	0.0504	-0.2288	-0.1022	-0.4340***	-0.0088	-0.0535	-0.1754	0.0235	-0.0081
	(0.1512)	(0.1217)	(0.2048)	(0.1755)	(0.1836)	(0.1492)	(0.0633)	(0.0611)	(0.1456)	(0.1647)	(0.9218)
2009_10-year	0.0911	0.0690	-0.0507	-0.0561	0.0457	-0.3384**	-0.0050	-0.0478	-0.1954	-0.0755	-0.0308
	(0.1715)	(0.1353)	(0.2142)	(0.1750)	(0.1820)	(0.1513)	(0.0629)	(0.0621)	(0.1493)	(0.1694)	(0.9311)
2009_11-year	0.0472	0.0059	-0.0363	-0.0487	0.0887	-0.3782**	0.0696	0.0481	-0.2368	-0.1119	0.0116
	(0.1728)	(0.1362)	(0.2157)	(0.1763)	(0.1838)	(0.1525)	(0.0658)	(0.0666)	(0.1578)	(0.1777)	(0.9433)
2009_12-year	0.0169	0.0432	-0.0177	-0.0024	0.1462	-0.3574**	-0.0557	-0.0894	-0.1969	-0.2043	0.2649
	(0.1734)	(0.1367)	(0.2165)	(0.1776)	(0.1859)	(0.1534)	(0.0683)	(0.0708)	(0.1681)	(0.1852)	(0.9772)

Figure 11: Fixed effect estimation part1

Year	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2009_9-year	(0.2438)	(0.1671)	(0.2855)	(0.2298)	(0.2284)	(0.2114)	(0.0796)	(0.0736)	(0.1721)	(0.1953)	(0.9660)
	-0.1238	0.0509	0.0504	-0.2288	-0.1022	-0.4340***	-0.0088	-0.0535	-0.1754	0.0235	-0.0081
2009_10-year	(0.1512)	(0.1217)	(0.2048)	(0.1755)	(0.1836)	(0.1492)	(0.0633)	(0.0611)	(0.1456)	(0.1647)	(0.9218)
	0.0911	0.0690	-0.0507	-0.0561	0.0457	-0.3384**	-0.0050	-0.0478	-0.1954	-0.0755	-0.0308
2009_11-year	(0.1715)	(0.1353)	(0.2142)	(0.1750)	(0.1820)	(0.1513)	(0.0629)	(0.0621)	(0.1493)	(0.1694)	(0.9311)
	0.0472	0.0059	-0.0363	-0.0487	0.0887	-0.3782**	0.0696	0.0481	-0.2368	-0.1119	0.0116
2009_12-year	(0.1728)	(0.1362)	(0.2157)	(0.1763)	(0.1838)	(0.1525)	(0.0658)	(0.0666)	(0.1578)	(0.1777)	(0.9433)
	0.0169	0.0432	-0.0177	-0.0024	0.1462	-0.3574**	-0.0557	-0.0894	-0.1969	-0.2043	0.2649
2010_1-year	(0.1734)	(0.1367)	(0.2165)	(0.1776)	(0.1859)	(0.1534)	(0.0683)	(0.0708)	(0.1681)	(0.1852)	(0.9772)
	0.0881	-0.0064	-0.4654**	-0.0215	-0.1758	-0.4792***	-0.0068	0.0375	-0.0984	-0.1080	-0.0585
2010_2-year	(0.1629)	(0.1214)	(0.1845)	(0.1655)	(0.1703)	(0.1391)	(0.0471)	(0.0430)	(0.0858)	(0.0975)	(0.2707)
	-0.0214	0.3265***	-0.4131**	-0.0517	-0.1658	-0.5066***	-0.0818	-0.0984*	-0.1495	-0.1808	0.1538
2010_3-year	(0.1659)	(0.1259)	(0.1883)	(0.1699)	(0.1749)	(0.1427)	(0.0613)	(0.0580)	(0.1280)	(0.1425)	(0.4754)
	-0.0185	0.3201**	-0.3766**	-0.0658	-0.1268	-0.4440***	-0.1228*	-0.0464	-0.0408	-0.0031	-0.1008
2010_4-year	(0.1673)	(0.1271)	(0.1908)	(0.1729)	(0.1783)	(0.1450)	(0.0687)	(0.0688)	(0.1520)	(0.1685)	(0.6298)
	0.0089	0.3366***	-0.4083**	-0.0522	0.1153	-0.4324***	-0.1104	0.0249	0.0439	-0.0492	-0.0026
2010_5-year	(0.1678)	(0.1276)	(0.1919)	(0.1739)	(0.1804)	(0.1458)	(0.0711)	(0.0751)	(0.1608)	(0.1785)	(0.6625)
	-0.0421	0.1760	-0.4882*	-0.2532	-0.1384	-0.5188**	0.0212	0.1064	-0.0021	-0.0964	-0.2940
2010_6-year	(0.2255)	(0.1726)	(0.2561)	(0.2534)	(0.2695)	(0.2253)	(0.0833)	(0.0873)	(0.1890)	(0.2115)	(0.7839)
	0.1320	0.2285	-0.3539	-0.0702	-0.2836	-0.2897	0.0321	0.0671	0.0553	0.0520	0.1412
2010_7-year	(0.2339)	(0.1737)	(0.2728)	(0.2409)	(0.2598)	(0.2188)	(0.0814)	(0.0830)	(0.1828)	(0.2042)	(0.7601)
	0.1887	0.3400**	-0.4786*	-0.3137	-0.2845	-0.4867**	-0.2143**	-0.0313	-0.0833	-0.1129	-0.1376
2010_8-year	(0.2162)	(0.1535)	(0.2468)	(0.2249)	(0.2366)	(0.1961)	(0.0858)	(0.0838)	(0.1884)	(0.2115)	(0.7883)
	-0.1921	0.3273***	-0.5050***	-0.6785***	-0.3680**	-0.8073***	-0.2160***	-0.0589	0.0091	-0.0801	-0.5887
2010_9-year	(0.1554)	(0.1254)	(0.1952)	(0.1937)	(0.1859)	(0.1660)	(0.0688)	(0.0683)	(0.1585)	(0.1766)	(0.7189)
	-0.1217	0.3838***	-0.3161*	-0.2573	-0.1048	-0.5120***	-0.0524	0.0137	0.1823	0.0547	-0.2543
2010_10-year	(0.1415)	(0.1097)	(0.1742)	(0.1705)	(0.1798)	(0.1387)	(0.0595)	(0.0577)	(0.1388)	(0.1518)	(0.6437)
	0.0557	0.3379***	-0.4040**	-0.0551	0.0476	-0.4657***	0.0126	0.0139	0.0437	-0.0603	-0.0637
2010_11-year	(0.1629)	(0.1248)	(0.1852)	(0.1700)	(0.1782)	(0.1409)	(0.0594)	(0.0588)	(0.1430)	(0.1571)	(0.6690)
	-0.0200	0.3239**	-0.3652*	0.0228	0.1356	-0.4607***	0.0052	0.0545	-0.0355	-0.1090	0.2377
2011_1-year	(0.1662)	(0.1270)	(0.1893)	(0.1734)	(0.1817)	(0.1446)	(0.0663)	(0.0686)	(0.1628)	(0.1778)	(0.7320)
	-0.0383	0.4672***	-0.1550	0.1298	0.1224	-0.1655	0.0536	-0.0903*	-0.0543	-0.0957	0.0255
2011_2-year	(0.1610)	(0.1117)	(0.2080)	(0.1791)	(0.1766)	(0.1497)	(0.0526)	(0.0483)	(0.0964)	(0.1094)	(0.3318)
	-0.0688	0.3786***	-0.1104	0.0757	0.1401	-0.1572	-0.0056	-0.0728	-0.0152	-0.0864	0.0847
2011_3-year	(0.1650)	(0.1159)	(0.2128)	(0.1846)	(0.1820)	(0.1545)	(0.0680)	(0.0669)	(0.1432)	(0.1580)	(0.5088)
	-0.0325	0.3903***	-0.1314	0.0836	0.3783**	-0.1265	-0.0064	-0.0603	0.0641	0.0672	0.4960
2011_4-year	(0.1672)	(0.1178)	(0.2162)	(0.1876)	(0.1857)	(0.1569)	(0.0757)	(0.0813)	(0.1687)	(0.1856)	(0.6149)
	-0.0798	0.2494	-0.1730	-0.0546	0.2438	-0.1793	0.1578*	0.0295	0.1635	0.1055	0.2730
2011_5-year	(0.2252)	(0.1655)	(0.2752)	(0.2633)	(0.2734)	(0.2329)	(0.0882)	(0.0961)	(0.1986)	(0.2197)	(0.7296)
	0.1154	0.3154*	-0.0616	0.1561	0.2176	0.0606	0.2012**	0.0431	0.1730	0.1856	1.0088
2011_6-year	(0.2341)	(0.1670)	(0.2920)	(0.2521)	(0.2667)	(0.2271)	(0.0886)	(0.0981)	(0.2014)	(0.2235)	(0.7602)
	0.0779	0.2962*	-0.2151	-0.2535	-0.1371	-0.2046	0.0653	-0.0376	0.0211	-0.0998	0.3096
2011_7-year	(0.2281)	(0.1512)	(0.2654)	(0.2336)	(0.2551)	(0.2039)	(0.0898)	(0.0936)	(0.2011)	(0.2208)	(0.8054)
	-0.0384	0.4702***	-0.0544	-0.2436	-0.0087	-0.1999	-0.0463	-0.0437	0.0494	-0.0400	0.6851
2011_8-year	(0.1183)	(0.1052)	(0.1940)	(0.2025)	(0.2019)	(0.1642)	(0.0734)	(0.0757)	(0.1649)	(0.1798)	(0.6718)
	-0.1726	0.4563***	-0.1835	-0.4126**	0.0496	-0.4180**	-0.0517	-0.0645	0.0490	-0.0711	-0.0065
2011_9-year	(0.1509)	(0.1126)	(0.2149)	(0.2031)	(0.1887)	(0.1723)	(0.0642)	(0.0637)	(0.1450)	(0.1569)	(0.6324)
	-0.1420	0.4508***	-0.0028	0.0047	0.3030	-0.1533	0.1291**	-0.0216	0.1956	0.0610	0.2108
2011_10-year	(0.1391)	(0.0968)	(0.1983)	(0.1831)	(0.1846)	(0.1489)	(0.0608)	(0.0578)	(0.1373)	(0.1461)	(0.5937)
	0.0243	0.4413***	-0.0262	0.2242	0.5180***	-0.0526	0.1123*	-0.0804	0.1377	-0.0824	0.6446
2012_1-year	(0.1611)	(0.1138)	(0.2085)	(0.1830)	(0.1836)	(0.1513)	(0.0609)	(0.0602)	(0.1443)	(0.1534)	(0.6313)
	0.0797	0.1175	-0.1028	0.2091	0.2663*	-0.0027	0.0230	-0.0307	0.0448	0.1374	-0.0365
2012_2-year	(0.1680)	(0.1176)	(0.1800)	(0.1473)	(0.1539)	(0.1569)	(0.0506)	(0.0517)	(0.1008)	(0.1143)	(0.3126)
	0.0980	0.0925	-0.1308	0.2041	0.5132***	-0.0342	-0.0397	-0.0005	0.1000	0.1586	-0.2292
2012_3-year	(0.1719)	(0.1212)	(0.1854)	(0.1528)	(0.1602)	(0.1615)	(0.0649)	(0.0719)	(0.1423)	(0.1628)	(0.4660)
	0.0537	-0.0632	-0.1945	0.0312	0.4034	-0.0745	0.0963	0.0589	0.1396	0.2229	-0.3751
2012_4-year	(0.2292)	(0.1689)	(0.2540)	(0.2410)	(0.2584)	(0.2368)	(0.0838)	(0.0944)	(0.1895)	(0.2147)	(0.6789)
	0.2446	-0.0172	-0.0618	0.2577	0.4640*	0.1712	0.1336	0.1010	0.2154	0.4586**	0.3513
2012_5-year	(0.2394)	(0.1712)	(0.2742)	(0.2312)	(0.2531)	(0.2333)	(0.0890)	(0.1062)	(0.2056)	(0.2319)	(0.7015)
	0.2143	-0.0499	-0.2635	-0.1498	0.1845	-0.0929	0.0108	0.0900	0.1222	0.1837	-0.2273
2012_6-year	(0.2321)	(0.1561)	(0.2464)	(0.2110)	(0.2427)	(0.2111)	(0.0889)	(0.1019)	(0.2026)	(0.2298)	(0.7361)
	0.0162	-0.0218	-0.1483	-0.3336*	-0.0443	-0.1599	0.0236	0.0506	0.1140	0.3432*	-0.2635
2012_7-year	(0.1471)	(0.1190)	(0.1653)	(0.1723)	(0.2019)	(0.1725)	(0.0677)	(0.0782)	(0.1585)	(0.1806)	(0.6687)
	0.1519	0.1565	-0.0409	-0.1442	0.1925	-0.0691	-0.1204**	0.0116	0.1340	0.3302**	-0.2523
2012_8-year	(0.1230)	(0.1094)	(0.1597)	(0.1718)	(0.1803)	(0.1704)	(0.0593)	(0.0638)	(0.1327)	(0.1519)	(0.6138)
	-0.0303	0.0739	-0.1577	-0.3228*	0.2974*	-0.3107*	-0.0708	-0.0169	0.0910	0.3253**	-0.9720*
2012_9-year	(0.1562)	(0.1178)	(0.1872)	(0.1738)	(0.1675)	(0.1790)	(0.0548)	(0.0556)	(0.1237)	(0.1420)	(0.5751)
	0.0013	0.0797	0.0675	0.1774	0.6054***	-0.0092	0.0653	0.0269	0.3091**	0.5356***	-0.6842
2013_1-year	(0.1480)	(0.1033)	(0.1694)	(0.1512)	(0.1634)	(0.1570)	(0.0560)	(0.0583)	(0.1310)	(0.1452)	(0.6321)
	-0.0290	0.0946	-0.2669	0.1264	0.2183	0.1038	-0.0466	0.0400	-0.0603	-0.0803	0.1948
2013_2-year	(0.2060)	(0.1175)	(0.1965)	(0.1352)	(0.1424)	(0.1454)	(0.0420)	(0.0487)	(0.0913)	(0.1072)	(0.3551)
	-0.1155	-0.1090	-0.3280	-0.0259	0.1222	0.0366	0.0377	0.0538	-0.0781	-0.1539	0.2221

Figure 12: Fixed effect estimation part2

2012_7-year	0.1519 (0.1230)	0.1565 (0.1094)	-0.0409 (0.1597)	-0.1442 (0.1718)	0.1925 (0.1803)	-0.0691 (0.1704)	-0.1204** (0.0593)	0.0116 (0.0638)	0.1340 (0.1327)	0.3302** (0.1519)	-0.2523 (0.6138)
2012_8-year	-0.0303 (0.1562)	0.0739 (0.1178)	-0.1577 (0.1872)	-0.3228* (0.1738)	0.2974** (0.1675)	-0.3107* (0.1790)	-0.0708 (0.0548)	-0.1669 (0.0556)	0.0910 (0.1237)	0.3253** (0.1420)	-0.9720* (0.5751)
2012_9-year	0.0013 (0.1480)	0.0797 (0.1033)	0.0675 (0.1694)	0.1774 (0.1512)	0.6054*** (0.1634)	-0.0092 (0.1570)	0.0653 (0.0560)	0.0269 (0.0583)	0.3091** (0.1310)	0.5356*** (0.1452)	-0.6842 (0.6321)
2013_1-year	-0.0290 (0.2060)	0.0946 (0.1175)	-0.2669 (0.1965)	0.1264 (0.1352)	0.2183 (0.1424)	0.1038 (0.1454)	-0.0466 (0.0420)	0.0400 (0.0487)	-0.0603 (0.0913)	-0.0803 (0.1072)	0.1948 (0.3551)
2013_2-year	-0.1155 (0.2547)	-0.1090 (0.1667)	-0.3280 (0.2631)	-0.0259 (0.2310)	0.1222 (0.2488)	0.0366 (0.2267)	0.0377 (0.0714)	0.0538 (0.0805)	-0.0781 (0.1630)	-0.1539 (0.1853)	0.2221 (0.6025)
2013_3-year	0.0568 (0.2642)	-0.0638 (0.1694)	-0.2103 (0.2830)	0.2220 (0.2237)	0.1967 (0.2425)	0.2916 (0.2250)	0.0867 (0.0779)	0.0439 (0.0929)	0.0444 (0.1814)	0.0344 (0.2069)	0.9399 (0.6615)
2013_4-year	0.0284 (0.2544)	-0.0775 (0.1538)	-0.4039 (0.2585)	-0.1449 (0.2045)	0.0135 (0.2338)	0.0419 (0.2036)	-0.0434 (0.0826)	0.0140 (0.0985)	-0.0788 (0.1922)	-0.1413 (0.2199)	0.4031 (0.7092)
2013_5-year	-0.1491 (0.1792)	-0.0659 (0.1159)	-0.3099* (0.1859)	-0.3162* (0.1667)	-0.1495 (0.1957)	-0.0248 (0.1655)	-0.0406 (0.0626)	0.0129 (0.0811)	-0.0810 (0.1552)	-0.0504 (0.1797)	0.2116 (0.6319)
2013_6-year	-0.0981 (0.1756)	-0.0446 (0.1131)	-0.2598 (0.1791)	-0.3068* (0.1615)	-0.2402 (0.1899)	0.0076 (0.1612)	-0.0625 (0.0479)	0.0374 (0.0589)	-0.0652 (0.1188)	-0.0696 (0.1373)	0.1297 (0.5710)
2013_7-year	-0.0005 (0.1614)	0.0583 (0.1068)	-0.1956 (0.1778)	-0.1569 (0.1644)	-0.0090 (0.1685)	0.0693 (0.1629)	-0.1321*** (0.0447)	0.0014 (0.0489)	-0.1275 (0.1078)	-0.0505 (0.1232)	0.5630 (0.4951)
2013_8-year	-0.2053 (0.1893)	-0.0054 (0.1163)	-0.3142 (0.2056)	-0.2826* (0.1646)	0.1441 (0.1586)	-0.1496 (0.1708)	-0.1839*** (0.0462)	-0.0456 (0.0526)	-0.0975 (0.1186)	-0.0604 (0.1339)	0.0975 (0.5209)
2014_1-year	-0.0158 (0.1690)	0.0199 (0.1151)	-0.0369 (0.1884)	0.3320** (0.1608)	0.2662* (0.1549)	0.0666 (0.1548)	0.0278 (0.0480)	-0.0073 (0.0479)	0.0221 (0.1047)	-0.0619 (0.1178)	-0.0208 (0.4100)
2014_2-year	0.1768 (0.1861)	0.0067 (0.1213)	0.0543 (0.2155)	0.5211*** (0.1531)	0.3581** (0.1456)	0.2673* (0.1547)	0.0819 (0.0590)	-0.0040 (0.0653)	0.0853 (0.1349)	0.0918 (0.1506)	0.5966 (0.4644)
2014_3-year	0.1085 (0.1800)	-0.0170 (0.1029)	-0.1478 (0.1859)	0.1324 (0.1262)	0.1912 (0.1349)	0.0282 (0.1242)	-0.0627 (0.0694)	-0.0540 (0.0781)	-0.0741 (0.1608)	-0.1775 (0.1803)	0.0278 (0.5792)
2014_4-year	-0.0627 (0.0387)	0.0119 (0.0276)	-0.0694 (0.0538)	0.0081 (0.0445)	0.1077** (0.0487)	-0.0235 (0.0404)	-0.0153 (0.0446)	-0.0181 (0.0608)	0.0268 (0.1144)	-0.0014 (0.1294)	0.2277 (0.3715)
2014_5-year	-0.0185 (0.0201)	0.0448*** (0.0139)	-0.0451 (0.0303)	0.0243 (0.0238)	0.0793** (0.0327)	0.0058 (0.0202)	-0.0286 (0.0256)	0.0255 (0.0399)	-0.0171 (0.0701)	-0.0809 (0.0815)	0.1375 (0.2013)
2014_6-year	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)	0.0000 (0.0000)
2014_7-year	0.0840 (0.1462)	0.1437 (0.1124)	0.1016 (0.1721)	0.1872 (0.1826)	0.2618 (0.2034)	0.1011 (0.1669)	-0.1416*** (0.0453)	-0.0171 (0.0489)	0.0365 (0.1059)	0.0147 (0.1157)	0.3699 (0.4197)
2015_1-year	0.1567 (0.1833)	0.0599 (0.1186)	0.0648 (0.2113)	0.4900*** (0.1487)	0.2453* (0.1399)	0.3001** (0.1514)	0.1123** (0.0461)	-0.0030 (0.0451)	0.0445 (0.0979)	0.1240 (0.1100)	0.7088** (0.3119)
2015_2-year	0.0881 (0.1783)	-0.0150 (0.1013)	-0.1235 (0.1823)	0.0829 (0.1226)	0.0823 (0.1301)	0.0385 (0.1216)	-0.0284 (0.0626)	-0.0469 (0.0650)	-0.0960 (0.1402)	-0.1226 (0.1574)	0.0249 (0.4877)
2015_3-year	-0.0993*** (0.0378)	0.0172 (0.0273)	-0.0253 (0.0511)	-0.0544 (0.0432)	-0.0031 (0.0423)	-0.0057 (0.0396)	-0.0258 (0.0546)	-0.0620 (0.0546)	-0.0525 (0.1087)	-0.0126 (0.1224)	0.0811 (0.3814)
2015_4-year	-0.0163 (0.0199)	0.0370*** (0.0138)	0.0035 (0.0293)	-0.0024 (0.0230)	0.0353 (0.0265)	0.0296 (0.0199)	-0.0068 (0.0253)	-0.0246 (0.0381)	0.0567 (0.0674)	-0.0381 (0.0774)	0.0886 (0.1904)
2016_1-year	0.1122 (0.1750)	-0.0191 (0.0978)	-0.1070 (0.1772)	0.0943 (0.1165)	0.0377 (0.1237)	0.0217 (0.1170)	-0.0703 (0.0491)	-0.0378 (0.0443)	-0.1561 (0.1006)	-0.2390** (0.1130)	-0.3963 (0.3769)
2016_2-year	-0.0669** (0.0325)	-0.0070 (0.0234)	-0.0015 (0.0414)	-0.0626* (0.0361)	-0.0586* (0.0324)	-0.0228 (0.0341)	-0.0700** (0.0356)	-0.0687* (0.0407)	-0.1471* (0.0880)	-0.2081** (0.0983)	-0.0370 (0.3085)
2016_3-year	-0.0244 (0.0195)	0.0170 (0.0137)	0.0067 (0.0273)	-0.0239 (0.0213)	-0.0341* (0.0202)	0.0131 (0.0192)	-0.0641*** (0.0248)	-0.0044 (0.0332)	-0.0777 (0.0646)	-0.1368* (0.0721)	-0.1112 (0.2216)
1-year_EverTreated	0.2206* (0.1193)	0.3387*** (0.0624)	0.9999*** (0.1248)	1.0674*** (0.0858)	0.8448*** (0.0842)	1.1795*** (0.0873)	-0.0182 (0.0986)	0.0594 (0.0926)	0.3377 (0.2947)	0.0934 (0.3436)	0.6053** (0.2433)
2-year_EverTreated	0.2906** (0.1194)	0.4495*** (0.0688)	0.7935*** (0.1270)	1.0604*** (0.0892)	1.2092*** (0.0893)	0.8847*** (0.0904)	0.3919*** (0.1053)	0.0044 (0.0992)	0.4737 (0.3050)	0.1651 (0.3636)	1.1722*** (0.2642)
3-year_EverTreated	0.1975 (0.1226)	0.6063*** (0.0709)	0.9647*** (0.1299)	1.2027*** (0.0925)	1.5793*** (0.0948)	1.0358*** (0.0926)	0.7986*** (0.1119)	-0.0714 (0.1048)	0.6245** (0.3166)	0.5250 (0.3701)	1.6380*** (0.3034)
4-year_EverTreated	0.2556** (0.1269)	0.7498*** (0.0747)	1.1126*** (0.1366)	1.4423*** (0.0983)	2.1632*** (0.1019)	1.2209*** (0.0989)	1.0680*** (0.1181)	-0.1066 (0.1139)	0.6771** (0.3296)	0.6083 (0.3841)	1.6883*** (0.3652)
5-year_EverTreated	0.2578** (0.1309)	0.8686*** (0.0798)	1.3696*** (0.1496)	1.6088*** (0.1101)	2.3789*** (0.1172)	1.3568*** (0.1099)	1.2898*** (0.1228)	0.1002 (0.1318)	0.5245 (0.3414)	0.8178* (0.4251)	2.0242*** (0.3813)
6-year_EverTreated	0.2627* (0.1398)	0.9572*** (0.0873)	1.5451*** (0.1683)	1.7926*** (0.1225)	2.4672*** (0.1339)	1.5281*** (0.1178)	1.4450*** (0.1311)	0.0197 (0.1519)	0.6830 (0.3654)	1.1271*** (0.4323)	2.1185*** (0.4506)
7-year_EverTreated	0.3135** (0.1495)	1.0540*** (0.0932)	1.5890*** (0.1831)	1.9746*** (0.1318)	2.7222*** (0.1420)	1.6650*** (0.1256)	1.5043*** (0.1412)	0.1147 (0.1558)	0.8498** (0.3806)	1.2373*** (0.4352)	2.1885*** (0.4848)
8-year_EverTreated	0.2634* (0.1529)	1.1571*** (0.1020)	1.8217*** (0.1824)	2.1606*** (0.1544)	3.0497*** (0.1564)	1.7872*** (0.1349)	1.7235*** (0.1474)	0.1218 (0.1597)	0.6766* (0.3943)	0.9654** (0.4514)	2.2900*** (0.4760)
9-year_EverTreated	0.2845* (0.1543)	1.2550*** (0.1085)	1.9493*** (0.2106)	2.2848*** (0.1660)	3.2430*** (0.1880)	1.9360*** (0.1466)	1.7776*** (0.1551)	-0.0323 (0.1908)	0.5512 (0.4062)	1.0191** (0.4690)	2.4668*** (0.5593)
10-year_EverTreated	0.3646** (0.1727)	1.2331*** (0.1237)	2.1382*** (0.2360)	2.5330*** (0.2023)	3.4489*** (0.2670)	2.0419*** (0.1560)	1.8231*** (0.1689)	0.2406 (0.2162)	0.6850 (0.4432)	1.2735** (0.5025)	2.2528*** (0.6772)
11-year_EverTreated	0.3557* (0.2104)	1.2432*** (0.1331)	2.1206*** (0.2508)	2.7659*** (0.2463)	3.9551*** (0.2787)	2.0368*** (0.1855)	1.8514*** (0.1921)	0.1077 (0.2337)	0.0440 (0.5086)	1.3674** (0.5241)	2.3283*** (0.6300)
12-year_EverTreated	0.3995 (0.2496)	1.4368*** (0.1732)	2.4861*** (0.2375)	3.0249*** (0.2734)	4.7880*** (0.3807)	2.1169*** (0.2343)	2.2443*** (0.2164)	0.1659 (0.3419)	0.3836 (0.4925)	1.4507*** (0.5318)	2.0160*** (0.6996)
13-year_EverTreated	0.2594 (0.2998)	1.6588*** (0.2311)	2.5502*** (0.3426)	3.0962*** (0.4043)	5.5717*** (0.6138)	2.5966*** (0.3696)	2.5247*** (0.2748)	0.3287 (0.3437)	-0.2122 (0.6148)	0.5096 (0.9231)	0.5920 (1.4106)
Constant	1.8957*** (0.0893)	1.3413*** (0.0835)	2.9952*** (0.1096)	3.2438*** (0.0934)	1.9815*** (0.1212)	4.5961*** (0.0835)	3.1650*** (0.0247)	1.8948*** (0.0182)	0.0781* (0.0414)	1.4783*** (0.0453)	3.3943*** (0.1840)
Observations	371,741	373,293	498,713	679,084	544,950	718,585	435,395	388,234	155,887	144,472	9,015
R-squared	0.0077	0.0878	0.0980	0.0695	0.0177	0.1445	0.1784	0.0037	0.0051	0.0196	0.0579
Number of id	87,581	87,379	119,826	141,493	130,407	145,107	94,917	120,942	58,111	54,999	4,240

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 13: Fixed effect estimation part3

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	1.436252	.5484409	2.62	0.009	.3613276	2.511177
Post_avg	3.057347	1.123304	2.72	0.006	.855711	5.258983
Tm7	1.829093	1.414203	1.29	0.196	-.9426935	4.60088
Tm6	1.156194	1.006247	1.15	0.251	-.8160151	3.128402
Tm5	.6351281	.463002	1.37	0.170	-.2723392	1.542595
Tm4	1.078643	.4042704	2.67	0.008	.2862881	1.870999
Tm3	1.37771	.38349	3.59	0.000	.6260833	2.129337
Tm2	2.136584	.7249843	2.95	0.003	.7156406	3.557527
Tm1	1.840413	.5390058	3.41	0.001	.7839809	2.896845
Tp0	2.002711	.492363	4.07	0.000	1.037697	2.967725
Tp1	4.031387	1.023796	3.94	0.000	2.024784	6.037991
Tp2	6.904813	2.431596	2.84	0.005	2.138972	11.67065
Tp3	7.657446	3.146766	2.43	0.015	1.489898	13.82499
Tp4	-1.388337	1.50479	-0.92	0.356	-4.337671	1.560996
Tp5	-.8639384	1.807602	-0.48	0.633	-4.406774	2.678897

Figure 14: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	-.3885644	.6701471	-0.58	0.562	-1.702029	.9248997
Post_avg	.8011101	.5856489	1.37	0.171	-.3467406	1.948961
Tm7	-2.918656	3.150502	-0.93	0.354	-9.093527	3.256215
Tm6	4.541779	2.88109	1.58	0.115	-1.105053	10.18861
Tm5	-.8165663	1.369394	-0.60	0.551	-3.500529	1.867397
Tm4	-1.476122	1.100468	-1.34	0.180	-3.632999	.6807552
Tm3	-1.34386	.6407773	-2.10	0.036	-2.599761	-.0879598
Tm2	-.5563672	.5684018	-0.98	0.328	-1.670414	.55768
Tm1	-.1501587	.4812967	-0.31	0.755	-1.093483	.7931654
Tp0	-.1421459	.5167465	-0.28	0.783	-1.15495	.8706586
Tp1	-.2320259	.5526329	-0.42	0.675	-1.315166	.8511147
Tp2	-.3439735	.7003632	-0.49	0.623	-1.71666	1.028713
Tp3	2.067439	1.349464	1.53	0.126	-.5774608	4.71234
Tp4	2.231554	1.619058	1.38	0.168	-.9417414	5.404849
Tp5	1.225813	1.61553	0.76	0.448	-1.940568	4.392194

Figure 15: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	78.28749	31.12943	2.51	0.012	17.27494	139.3
Post_avg	593.8372	164.2933	3.61	0.000	271.8282	915.8462
Tm7	-70.84302	65.34418	-1.08	0.278	-198.9153	57.22921
Tm6	66.41246	63.37518	1.05	0.295	-57.80062	190.6255
Tm5	108.1449	42.97146	2.52	0.012	23.9224	192.3674
Tm4	70.98093	39.79003	1.78	0.074	-7.006105	148.968
Tm3	174.3174	53.82694	3.24	0.001	68.81854	279.8163
Tm2	109.6443	40.21066	2.73	0.006	30.83281	188.4557
Tm1	89.35549	40.95052	2.18	0.029	9.093952	169.617
Tp0	373.8425	145.2586	2.57	0.010	89.14092	658.5441
Tp1	492.2595	190.9828	2.58	0.010	117.94	866.5789
Tp2	654.0144	198.7974	3.29	0.001	264.3787	1043.65
Tp3	1015.551	436.0835	2.33	0.020	160.8435	1870.259
Tp4	326.0581	261.5884	1.25	0.213	-186.6457	838.7619
Tp5	701.2973	519.9316	1.35	0.177	-317.7499	1720.345

Figure 16: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	42.22892	11.49661	3.67	0.000	19.69598	64.76186
Post_avg	135.6918	39.01693	3.48	0.001	59.22005	212.1636
Tm7	25.63844	25.50523	1.01	0.315	-24.35088	75.62776
Tm6	3.889645	20.5334	0.19	0.850	-36.35507	44.13436
Tm5	56.89902	30.88617	1.84	0.065	-3.636756	117.4348
Tm4	32.0578	10.48023	3.06	0.002	11.51693	52.59867
Tm3	35.81361	9.202585	3.89	0.000	17.77688	53.85035
Tm2	70.89633	17.97663	3.94	0.000	35.66279	106.1299
Tm1	70.4076	14.85155	4.74	0.000	41.2991	99.51611
Tp0	83.26355	16.39703	5.08	0.000	51.12596	115.4011
Tp1	158.1978	28.96412	5.46	0.000	101.4291	214.9664
Tp2	225.8608	54.25794	4.16	0.000	119.5172	332.2044
Tp3	347.729	139.6399	2.49	0.013	74.03976	621.4183
Tp4	27.17034	75.58666	0.36	0.719	-120.9768	175.3175
Tp5	-28.07054	23.69046	-1.18	0.236	-74.50299	18.36191

Figure 17: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	59.14638	18.64995	3.17	0.002	22.59316	95.6996
Post_avg	756.9941	383.936	1.97	0.049	4.49341	1509.495
Tm7	-22.17608	38.10039	-0.58	0.561	-96.85146	52.49931
Tm6	.9039112	21.95243	0.04	0.967	-42.12205	43.92987
Tm5	39.47283	26.34732	1.50	0.134	-12.16698	91.11263
Tm4	73.35303	42.05326	1.74	0.081	-9.069843	155.7759
Tm3	102.4739	39.53491	2.59	0.010	24.98688	179.9609
Tm2	64.41203	26.94775	2.39	0.017	11.59541	117.2286
Tm1	155.5851	50.70146	3.07	0.002	56.21205	254.9581
Tp0	300.4411	139.6487	2.15	0.031	26.73456	574.1475
Tp1	561.9801	226.8162	2.48	0.013	117.4285	1006.532
Tp2	476.9174	144.7391	3.30	0.001	193.2339	760.601
Tp3	553.9458	211.2185	2.62	0.009	139.9653	967.9264
Tp4	215.6448	314.2638	0.69	0.493	-400.3009	831.5905
Tp5	2433.035	2010.466	1.21	0.226	-1507.407	6373.477

Figure 18: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	83.21357	12.9707	6.42	0.000	57.79146	108.6357
Post_avg	376.1731	95.65125	3.93	0.000	188.7001	563.6462
Tm7	37.43369	29.16744	1.28	0.199	-19.73344	94.60083
Tm6	55.71239	19.36855	2.88	0.004	17.75073	93.67405
Tm5	63.08412	20.81617	3.03	0.002	22.28517	103.8831
Tm4	104.8926	36.73437	2.86	0.004	32.89452	176.8906
Tm3	63.34759	11.69213	5.42	0.000	40.43143	86.26375
Tm2	88.52385	15.9554	5.55	0.000	57.25183	119.7959
Tm1	169.5008	39.28466	4.31	0.000	92.50425	246.4973
Tp0	261.5836	144.4617	1.81	0.070	-21.5562	544.7234
Tp1	544.4148	233.0002	2.34	0.019	87.74267	1001.087
Tp2	338.942	70.28151	4.82	0.000	201.1928	476.6912
Tp3	630.4686	163.7136	3.85	0.000	309.5959	951.3413
Tp4	125.8701	80.1981	1.57	0.117	-31.31531	283.0555
Tp5	355.7598	341.8476	1.04	0.298	-314.2491	1025.769

Figure 19: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	-14.04505	11.9554	-1.17	0.240	-37.47722	9.387106
Post_avg	-54.79477	50.6985	-1.08	0.280	-154.162	44.57247
Tm7	18.35457	20.63909	0.89	0.374	-22.09729	58.80644
Tm6	14.38117	29.61003	0.49	0.627	-43.65342	72.41576
Tm5	-25.9116	27.52623	-0.94	0.347	-79.86201	28.03882
Tm4	-13.51831	13.59272	-0.99	0.320	-40.15954	13.12293
Tm3	-12.32876	18.1349	-0.68	0.497	-47.87252	23.21499
Tm2	-54.00803	28.70805	-1.88	0.060	-110.2748	2.258706
Tm1	-25.28444	16.56563	-1.53	0.127	-57.75248	7.183602
Tp0	16.23401	39.19112	0.41	0.679	-60.57918	93.04721
Tp1	-79.33178	26.11502	-3.04	0.002	-130.5163	-28.14728
Tp2	-217.3616	66.48054	-3.27	0.001	-347.6611	-87.06218
Tp3	-325.017	212.3425	-1.53	0.126	-741.2007	91.16659
Tp4	-10.94526	61.15656	-0.18	0.858	-130.8099	108.9194
Tp5	287.6531	111.1531	2.59	0.010	69.79693	505.5093

Figure 20: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	.6178716	.8421622	0.73	0.463	-1.032736	2.268479
Post_avg	1.488529	8.4291	0.18	0.860	-15.0322	18.00926
Tm7	-5.469683	5.095384	-1.07	0.283	-15.45645	4.517085
Tm6	8.249005	4.784763	1.72	0.085	-1.128959	17.62697
Tm5	-1.243323	2.828835	-0.44	0.660	-6.787737	4.301092
Tm4	1.070803	2.194822	0.49	0.626	-3.23097	5.372576
Tm3	3.280174	2.014878	1.63	0.104	-.6689143	7.229262
Tm2	-2.165686	2.035091	-1.06	0.287	-6.154391	1.823019
Tm1	.603811	1.970948	0.31	0.759	-3.259175	4.466797
Tp0	2.607481	1.664085	1.57	0.117	-.6540654	5.869027
Tp1	3.695377	2.784259	1.33	0.184	-1.761669	9.152424
Tp2	-1.200919	4.541122	-0.26	0.791	-10.10135	7.699516
Tp3	-6.423708	6.002945	-1.07	0.285	-18.18926	5.341848
Tp4	8.764416	33.3778	0.26	0.793	-56.65486	74.1837

Figure 21: Event study for number of employees

ATT by Periods Before and After treatment
Event Study:Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	.3588497	.9127566	0.39	0.694	-1.43012	2.14782
Post_avg	1.254001	1.886283	0.66	0.506	-2.443046	4.951048
Tm7	-5.212667	6.00948	-0.87	0.386	-16.99103	6.565698
Tm6	1.75519	.6492223	2.70	0.007	.4827378	3.027643
Tm5	2.319011	1.131986	2.05	0.040	.1003598	4.537662
Tm4	1.253464	1.978278	0.63	0.526	-2.623891	5.130818
Tm3	.8042881	1.770769	0.45	0.650	-2.666355	4.274932
Tm2	-.3865017	1.224583	-0.32	0.752	-2.786641	2.013638
Tm1	1.979164	.9136538	2.17	0.030	.1884354	3.769892
Tp0	-.1283779	.8171513	-0.16	0.875	-1.729965	1.473209
Tp1	7.016527	7.292967	0.96	0.336	-7.277426	21.31048
Tp2	.8348215	1.135703	0.74	0.462	-1.391115	3.060758
Tp3	-.2986165	1.759205	-0.17	0.865	-3.746594	3.149361
Tp4	-2.664075	4.558392	-0.58	0.559	-11.59836	6.27021
Tp5	2.763727	1.068487	2.59	0.010	.6695305	4.857924

Figure 22: Event study for number of employees

ATT by Periods Before and After treatment
 Event Study: Dynamic effects

	Coefficient	Std. err.	z	P> z	[95% conf. interval]	
Pre_avg	94.83943	58.85691	1.61	0.107	-20.51801	210.1969
Post_avg	135.7837	104.8455	1.30	0.195	-69.70977	341.2772
Tm6	45.37182	31.33666	1.45	0.148	-16.0469	106.7905
Tm5	381.7497	334.936	1.14	0.254	-274.7128	1038.212
Tm4	37.85092	35.68651	1.06	0.289	-32.09335	107.7952
Tm3	41.65159	22.43829	1.86	0.063	-2.326652	85.62983
Tm2	45.25653	19.59837	2.31	0.021	6.84443	83.66862
Tm1	17.15606	39.58094	0.43	0.665	-60.42116	94.73327
Tp0	54.43865	55.04132	0.99	0.323	-53.44035	162.3176
Tp1	246.153	156.8081	1.57	0.116	-61.18509	553.4912
Tp2	269.7227	213.6239	1.26	0.207	-148.9726	688.4179
Tp3	-27.17958	161.5282	-0.17	0.866	-343.769	289.4098

Figure 23: Event study for number of employees