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Effect of monetary and non-monetary incentives in 3 different fields.

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Abstract

This thesis aims to investigate the effects of monetary and non-monetary incentives in 3 different fields.

In the first chapter, we analyse whether the behavioural theory of Student Identity Priming has positive effects on student performance. By conducting an experiment on both students and former students - taken as a control trial - we observe that stimulating students' identity through motivational pictures and videos has positive effects on academic performance.

The second chapter aims to analyse whether an increase in women's employment through government incentives has led to a reduction in gender-based violence. The results show that greater socio-economic independence leads to a reduction in gender-based violence.

Finally, the third chapter examines the effect of regional incentives provided for cutting the waste tax on tax evasion. Analysing data from the municipal budgets of two Italian regions, we find that the tax cut, reduced by incentives, leads to a reduction in tax evasion. To support this, we analyse other taxes that are not cut in the same way.

Abstract

Nel primo capitolo, analizziamo se la teoria comportamentale dello Student Identity Priming ha effetti positivi sul rendimento degli studenti. Conducendo un esperimento sia su studenti che su ex studenti - presi come trial di controllo - osserviamo che stimolare l'identità degli studenti attraverso immagini e video motivazionali ha effetti positivi sul rendimento accademico.

Il secondo capitolo ha come obiettivo quello di analizzare se un aumento dell'occupazione femminile, tramite incentivi governativi ha condotto ad una riduzione delle violenze di genere. I risultati mostrano che una maggiore indipendenza socio-economica comporta una riduzione delle violenze di genere.

Infine, il terzo capitolo esamina l'effetto degli incentivi regionali, erogati per il taglio della tassa sui rifiuti, sull'evasione fiscale. Analizzando i dati dei bilanci comunali di due regioni italiane, troviamo che il taglio della tassa, decurtata tramite incentivi, comporta una riduzione dell'evasione della stessa tassa. Per sostenere ciò analizziamo allo stesso modo altre tasse non decurtate.

Contents

List of Tables

Chapter 1

Chapter 2

Chapter 3

List of Figures

Chapter 1

Chapter 2

Chapter 3

Effect of monetary and non-monetary incentives in 3 different fields.

Introduction

This thesis aims to investigate the effects of monetary and non-monetary incentives in 3 different fields. The topic of incentives is much discussed in the economic literature, so with this work we tried to make a further contribution to that part of the literature, which claims that incentives of all kinds can positively modify the behaviour of individuals. The thesis is divided into 3 chapters that can be considered as 3 different papers.

The first chapter entitled "Priming and academic performance: evidence from an experiment" aims to assess whether the behavioural theory of Student Identity Priming has positive effects on student performance. By conducting an experiment on both students and former students - taken as a control trial - we observe that stimulating students' identity through motivational pictures and videos has positive effects on academic performance. The experiment has been coded and conducted by the Qualtrics system and we sent the survey to the Departments of Economics and Economics Business School of the University of Essex (UK) and the Departments of Economics and Business Administration of the University of Calabria (Italy). The students were divided into 2 groups, treatment and control. The treatment group was shown images and videos that stimulate student status, and the control group images and videos of artistic monuments. Former students from these universities were recruited for a control trial. Afterwards they answered an IQ test to assess academic performance. The results show that those with student status, who were stimulated with motivational images for students, performed better than all others.

The second chapter entitled “Gender-based violence and female labour market participation: the effect of increased employment on reports of sexual assault” aims to analyse whether an increase in women's employment through government incentives has led to a reduction in gender-based violence.

The results show that greater socio-economic independence leads to a reduction in gender-based violence. Law No. 205 of December 27th 2017 establishes a fund of €1 million for the 3 years 2018, 2019 and 2020 for the recruitment on open-ended contracts, by social cooperatives, of women victims of gender-based violence. In the first step, we focus on the impact of the law on the recruitment of women in co-operative societies. For policy evaluation, we use ISTAT data. In the second step, we analyse data from the Italian Department of Public Safety from 2016 to 2019 on violence, aggregated at the provincial level. Results show an increase in the female workforce in social co-operatives in the year the incentives were granted. In the same period, in those provinces with a high number of social co-operatives a reduction in rates of sexual violence is estimated.

Finally, the third chapter entitled "Paying less to pay more: the impact of tax cuts on tax evasion" examines the effect of regional incentives provided for cutting the waste tax on tax evasion. Analysing data from the municipal budgets of two Italian regions, we find that the tax cut, reduced by incentives, leads to a reduction in tax evasion. To support this, we analyse other taxes that are not cut in the same way. With the regional law of October 5th 2016, the Emilia Romagna financed, with a financing line called LFA, only a few virtuous municipalities producing a quantity of non-recyclable waste lower than the regional average. To assess the impact of these incentives, we take the region of Lombardy as a control group, where virtuous municipalities in this region have the same characteristics as virtuous municipalities in Emilia Romagna, but on the contrary do not receive any direct monetary incentive. The analysed dataset concerns municipal budgets and is provided by The Department of Internal and Territorial Affairs. Results show a reduction of tax evasion in municipalities where the tax was reduced compared to other municipalities in the post-reform period. By isolating virtuous municipalities in both regions, the treatment loses significance. However, tax evasion is higher in Emilia Romagna than in Lombardy. Finally, carrying out the same analysis for the other two taxes taken into consideration, we find no variation between the pre and post incentives period.

Although these are three very different chapters, the macro area of the whole thesis is incentives. In the first chapter, we use non-monetary incentives to stimulate better performance and effort in

students. In the following chapters, we analyse the effects of monetary incentives on two very important topics in the economic and social field, namely gender violence and tax evasion.

There is a wide range of work in the literature on monetary and non-monetary incentives. Many of these experiments show the potential and effects of either monetary incentives or non-monetary incentives. Both can be used to motivate individuals to perform a certain behaviour or for a greater effort. Erkal, Gangadharan and Koh (2018) with a laboratory experiment finds that both types of incentives are effective on the effort of individuals and that the results of actual efforts require a careful assessment of the motivations behind performance. Fehr and Falk (2002), argue that interacting certain personal motivations, such as the desire to reciprocate, the desire to gain social approval, and the intrinsic enjoyment arising from working on interesting tasks, with monetary incentives can better explain the effects of the latter. Furthermore, Ariely, Bracha and Meier (2009), both in a laboratory experiment and in a field study, argue that monetary incentives are linked by psychological aspects such as visibility. Indeed, monetary incentives lose their effectiveness when a pro-social action is paid for, and other individuals are aware of this extrinsic incentive. Therefore, monetary incentives depend on intrinsic and cognitive characteristics of the decision maker as Awasthi and Pratt (1990), Wright and Aboul-Ezz (1988) and Wright and Anderson (1989) say.

Many times, however, one incentive method is more effective than the other in certain contexts. On the one hand, Sorauren (2000) argues that especially in organisations non-monetary incentives are crucial to avoid opportunistic behaviour. Motivating employees leads to a better corporate vision. Incentives are not only used in work environments. The results of Rajapaksa et al (2019) suggest that both monetary and non-monetary incentives offered to households reduce water consumption and thus promote pro-environmental attitudes/behaviours. In this case, the impact is greater for non-monetary incentives. On the other hand, Della Vigna and Pope (2018) analysing the results of an experiment, find a higher effort with psychological incentives, but the best results are obtained with monetary incentives. In addition, in a recent study Campos-Mercade *et al* (2021), it is emphasised that

monetary incentives gave a boost to the increase in vaccinations for COVID-19, while a behavioral nudges did not have a significant impact.

Moreover, monetary incentives are used in many more fields. Ferraz and Finan (2009), in a study set in Brazil, point out that higher wages lead to an increase in the level of preparation, and an increase in the performance of politicians. In the environmental field, we find that a monetary incentive system on waste tax leads to an increase in the amount of material handed in for recycling (Thøgersen, 2003). Wall *et al* (2006) found evidence of a positive relationship between monetary incentives and food purchases, food consumption, or weight loss.

Our thesis goes on to assess the effects of monetary and non-monetary incentives in other fields of study.

The thesis is organized as follows. In Chapter 1 we expose the research on behavioural theory called priming. In Chapter 2 we set out the research on the relationship between sexual violence and an increase in female employment. In Chapter 3 we present the research on the relationship between tax incentives and tax evasion. In the last section, we draw concluding remarks.

Chapter 1

Priming and academic performance: evidence from an experiment.

Abstract

We analyse whether the behavioural theory of Student Identity Priming has positive effects on student performance. By conducting an experiment on both students and former students - taken as a control trial - we observe that stimulating students' identity through motivational pictures and videos has positive effects on academic performance.

Keywords: Priming, Non-Monetary Incentives, Behavioural Economics

1.1) Introduction

For a long time, researchers have focused on incentive systems and how to use them to improve both academic and work performance. The question we asked ourselves is: What kind of incentives can improve student effort and learning? Of course, the literature is full of evidence on the effectiveness of monetary incentives to increase performance, but very little is known about the effectiveness of non-monetary incentives. The aim of this study is to find out whether non-monetary incentives can be used in the academic environment, triggering student identity in such a way that more effort and better performance is required.

A study that spanned the research on monetary incentives to students is that of Altonji (1993), who found that students are sensitive to this type of incentive, and from this point onwards research was developed to find the measure of effort. For Example, Dynarski (2003), Nielsen, Sorensen and Taber (2010) show that financial incentives affect university attendance and Ordine, Rose and Fasano (2021) report that indirect monetary incentives, determined by improvements of labor market perspectives, shape student's effort. However, monetary incentives cannot be used to stimulate certain actions. For example, Johannesson and Mellstrom (2008) show how the supply of blood donors is reduced by half when an incentive for this action is introduced. Furthermore, in behavioural economics, psychological theories are used to improve the behaviour of individuals.

In this experiment, the theory used is the priming theory suggested by behavioural economics. Among the most famous are certainly the experiment by Bateson, Nettle and Roberts (2006), which revealed the increase in altruism thanks to the strength of a single image. More specifically we use identity priming, i.e. we assess whether triggering, through the use of images and videos, student identity leads to greater effort and better performance. The idea is based on identity theory, which describes how the identity of individuals guides their behaviour as soon as they are aware of it (see Benjamin, Choi and Stricklandet, 2010). We test the same theory on a group of non-students to confirm its effectiveness.

The experiment has been coded and conducted by the Qualtrics system and we sent the survey to the Departments of Economics and Economics Business School of the University of Essex (UK) and the Departments of Economics and Business Administration of the University of Calabria (Italy). 240 students responded to the survey and were randomly divided into two groups, treatment group and control group. Treaties watched some pictures and videos that recalled feelings and emotions related to their student status, while controlled participants watched some neutral pictures and video related to nature and famous monuments. Afterwards, the participants had the choice to answer 30 questions of the IQ test. These questions could be skipped by the students, which allowed us to estimate both the effort and the total score obtained. The results show a significant increase in the identity primed students' score compared to the control group. There is also an increase in the number of answers attempted and the number of correct answers given. In order to strengthen our results and to assess the real effectiveness of identity priming, a further experiment was carried out. We recruited former students who had graduated from the same universities. They are working individuals who no longer have student status at the time of the interview. We administered the same experiment as described above to evaluate the same parameters. The results show that the two groups, treated and controlled, of this new group are statistically identical. This shows that our theory of student identity priming is effective.

1.2)Literature Review

1.2.1) Introduction to behavioral economics

The classical economic theory has led us to think that the behavior of individuals is perfectly rational: that is, consumers always maximize their profits. Under uncertainty condition, the empirical evidence and the studies of cognitive psychologists show that human judgment follows certain heuristic rules rather than the laws of probability as in standard economic theory. For example, Dellavigna and Malmendair (2006) collected data on individuals who pay a monthly subscription of 80 euros for the gym, considering that the daily income is 10 euros, individuals should go at least 8 times according to the traditional economy. After collecting the data, the two scholars found that subscribers went on

average 4.4 times a month. These concepts are the basis of behavioral economics, which is an economic branch, born in the 70s in the United States. The principle is that our behaviors are responses to external stimuli.

1.2.2) Origin of Priming

The phenomenon of priming derives from cognitive psychology, and it is an unconscious memory system that allows a sensorial stimulus (auditory-verbal-visual), that has been exposed in the past, to be recognized unconsciously in the future. The priming effect consists of a preparation for the recognition of that stimulus; from English "to prime" or "triggering" automatic mechanisms that cause information in memory to bring the subject to the recognition of the stimulus (Fiore, 2016). It is based on the so-called recognition heuristic, or the activation of mental representations that act as shortcuts in identifying the impulse. The heuristics, which arise in our brain system, concern our predisposition to generate impulsive decisions on issues that are actually complex, through the automatic replacement of difficult questions with simpler ones, and basing the decision on the latter. The priming takes advantage of the heuristics, as an event is facilitated in mental processing through external stimuli. Priming therefore refers to the improvement in speed and precision of responding to a stimulus, such as a word or an image, when it is preceded by a connected stimulus (cat-dog), relative to when it is preceded by an unconnected stimulus (table -dog). The trigger is called prime (cat-table), while the next one is called target (dog). The answers are faster and more accurate when the target is tied to the prime (dog-cat), compared to when the target is not connected to the prime (table-dog). (McNamara and Timothy, 2005). Not much is known about the origin of priming and even if this is carefully studied in laboratories, we must say that we find similar attitudes in everyday life. For example, a stimulus can be a news and the priming effect is the recall from long-term memory of that news, and the sensations associated with it. In fact, each piece of news is stored within the mental scheme that the reader has built over time by connecting other received information. When a new stimulus occurs (e.g. a new piece of news concerning that topic), the reader recalls the completely interpretative scheme to mind.

1.2.3) Priming Identity

As said before, the priming refers to the activation of mental concepts that are poured over the behaviors and judgments in subsequent tasks. Recent studies and research on economics show that the social and economic environment, which is why priming has been used several times for economic experiments, i.e. experiments where the subjects' decisions are financially and non-financially stimulated, can also form these "preferences". The concept of identity in economics was introduced by Akerlof and Kranton (2000).These authors provided a model in which an individual's identity - the sense of belonging to a social group - influences economic actions and decisions. They argue that it is psychologically costly for individuals to deviate from their group behavior. After this study, other authors became interested in the relationship between identity and behaviour, more specifically in how group membership can modify an individual's choices and behaviour.

In Cohn and Maréchal (2015), prisoners in a maximum-security prison were instructed to flip a coin and then report the results by writing. The inmates only received a reward when they reported "heads". This led them to misreport their results when their coin flip was "tails". This shows that when prisoners were primed, their criminal identity made them more likely to deceive their outcome than a monitored group of "regular" patients. They repeated the experiments several times in the same prison and found that the prison increased the mental accessibility of the criminal's thoughts. On the other hand, other experiments reported that regular citizens did not deceive more than criminals, showing that the priming effect was aimed exclusively at individuals who already possessed a criminal identity. Similarly, Cohn et al. (2014) examined corporate identity within the banking industry, and how it can foster dishonest behaviour. Initially, bank employees were primed with their professional identity and associated norms, and then their dishonesty was measured using incentives to cheat. Triggering the corporate and professional identity - which is already part of their background - in bank employees pushes them towards more dishonest behaviour than the control group. Other studies have been carried out on religious identity - see Shariff and Norenzayan (2007) and Belnjamin et al. (2006) and athlete identity with Dee (2014) showing that identity priming of athletes reduces the cognitive

performance of athletes compared to the control group i.e. non-athletes. Problems of endogeneity mainly related to self-selection in social groups and unobserved confounders have prompted the use of experimental methods to avoid biased results.

As we have seen, the main idea is that priming is linked to a distinct and marked identity, and it is very important to use a randomised control group so as to emphasise even more that belonging to a group or category can modify individual behaviour and choice. In the first chapter we focus on student identity, we are going to stimulate students through images and videos in order to achieve better performance.

1.2.4) Monetary or non-monetary incentives?

In recent years, economists have carried out many lab experiments with the use of incentives, in particular with experiments where real effort occurred. Real effort activities require experimental participants to make a real physical or mental effort to earn money. In particular, let us focus on experiments that aim, using monetary incentives, to improve student performance and academic performance. Gneezy and Rustichini (2000), conducted an experiment on students who were involved in fundraising for charity. The subjects were divided into 3 groups. Group 1 collected 1% of the total amount gathered (the percentage of profit was paid by the experiment's promoters), group 2 received 10% of their collected amount, and finally the control group. Group 2 achieved the best performance because the high monetary incentive did not cause the crowding out effect, and then in order, we find the control group and group 1. What is the crowding-out effect? Monetary incentives, also called extrinsic incentives when they compete with intrinsic, psychological incentives, can lead to the reduction of the performance itself because all personal motivation of the person encouraged by money is lost; this effect is called Crowding Out effect. In the particular case of the research to improve the performance of students encouraged by money, we could unintentionally disclose bad information to the subjects, because the incentivized action, in this case the performance could be considered, either useless or with such a high rate of difficulty that the action deserves to be rewarded. Crowding

out can still lead to the short-term effects, i.e. once the incentives are removed, the effort of the subjects decreases because the action is perceived negatively. In addition, there may be reputational effects, incentivizing actions with a charitable purpose, the risk is to have a negative effect (e.g. incentivizing blood donors) because it affects the reputation of those who carry out the action. With our experiment, we try to obtain a better performance and a greater effort from the students and we try to achieve the goal by avoiding providing distorted or wrong information as it is described very well in Gneezy and Rustichini (2000). Therefore, by not using monetary incentives, we do not encourage students to commit themselves only for a gain, but through the use of priming we try to stimulate values such as willpower and determination to achieve better results.

1.3) Experiment Design

The experiment we conducted involved 240 students enrolled in two department of the University of Essex, EBS (Economics Business School) and Economics and in two department of the University of Calabria, Economics, Statistics and Finance and Business Administration and Law. The experiment was coded and conducted by the Qualtrics survey platform. The survey was divided into 3 parts. In the first part, students answered questions about their background. These questions are used to obtain standard demographic information and to perform ex-post balancing tests to check the quality of the implemented randomization. . In the second part, we find the psychological theory of priming that is the part of the treatment, where images and videos are shown. In the third part, the students answered questions taken from the IQ Test where we will draw our dependent variables. These are the Final Score obtained by each student, the number of given answers attempted, proxies the Effort exerted by students and the number of Correct Answers.

The second part involves the treatment and students watched and described (just few words) some pictures and videos that contained motivational messages to stimulate effort. In particular, we showed images representing the moment of graduation as the ultimate goal.

Figure 1.1: Examples of pictures shown to the treated group

In order to keep the two surveys (for control and treatment groups) as similar as possible, pictures depicting natural landscapes and artistic structures, such as ancient castles and famous building, were showed as a placebo effect for control group.

Figure 1.2: Examples of pictures shown to the control group

This part, of course, was the most important in order to stimulate their cognitive system for the last part that is the quiz. The quiz was composed by 30 standard IQ-test questions that students had to answer with no time limits however, they could skip this part in every moment indeed, the option “go to the end of the block” has been inserted in each question in order to better observe the effort of each participant. If the other parts of the survey were compulsory, the opportunity to skip the IQ test was given, precisely to better grasp the desired effect. The values of the correct answers changed according to the difficulty and complexity of the question itself, a value ranging from a minimum of 0.5 to a maximum of 1.5. We did not include penalties for incorrect answers, so the final score is nothing more than the total sum of the correct answers weighted by their value.

1.4) Data

Table 1.1 provides descriptive statistics for the sample of students. As we said, we collected 240 observations of which 0.479 percent are men. The average age is 23.317. On a scale of 1 to 7, as you can see, fathers are a bit more educated than mothers are. The mean for fathers is 4.067 and 3.908 for mothers. A question about the lottery game was included in the questionnaire in order to collect the students' risk aversion. As in the work of Holt and Laury (2002), students have more options than they can choose. The difference is that the options in Holt and Laury (2002) were all lotteries, while our options include a lottery and a set of certain values.

Imagine you have a lottery ticket. This ticket gives a 50% chance of winning €100 and a 50% chance of winning €0.

-Would you give up the ticket for 1 euro??

-If you answered no to the previous question, would you give up your ticket for 10 Euros?

-If you answered no to the previous question, would you give up your ticket for 20 euros?

And so on up to 50 euros, once this threshold was exceeded, the amount that the student would have accepted to surrender his ticket was asked. In addition, only 0.342% of the students had previously participated in an experiment.

Table 1.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Gender	.479	.501	0	1
Age	23.317	3.364	18	39
Father Education	4.067	1.660	1	7
Mother Education	3.9	1.674	1	7
Father Occupation	2.992	1.21	1	4
Mother Occupation	2.833	1.243	1	4
Risk Aversion	45.296	31.255	0	100
University	.671	.471	0	1
Course Department	28.317	25.725	0	99
Past experience	.342	.475	0	1
IELTS Certification	1.917	.824	1	3
Treated	0.483	.501	0	1
Final Score	7.809	6.691	0	30
Effort	14.1	10.002	0	30
Correct Answer	8.758	6.832	0	30

We have collected information regarding the employment status of parents, with the possibility of not being able to answer this question by clicking the "other" option. This is to ensure the right not to disclose sensitive data.

In addition, students provided us with additional helpful information such as the course attended, country of birth, whether they hold an IELTS language certification, and whether they had participated in an experiment in the past. The variable of interest is the treated variable. Finally, Table 1.1 shows the averages of the attempted answers (effort), the correct answers given by the students and the final score. On average, the students answered about 14,1 questions, with about 8.7 correct answers. Remember that the total number of questions is 30.

Typically, the results of experiments are estimated by OLS (Ordinary least squares) regression in which the outcome Y is regressed on one (as in this case) or more treatment dummies T, and control variables X are inserted in the regression to allow more precise estimators as they help to reduce the unexplained variance component (the variance of the error term).

$$Y_i = \beta_0 + \beta_1 T_i + \Phi X_i + u_i \qquad (1.1)$$

For each OLS regression will be used robust Standard Error for heteroscedasticity. Having a reduced sample, bootstraps will be used that and we will see them in the appendix.

1.5) Empirical Results

In this section, in order to analyse the effects of priming on student performance, we estimate the following model by ordinary least squares (OLS):

$$Y_i = \beta_0 + \beta_1 T_i + \Phi X_i + u_i$$

Where Y_i is a measure of performance (score) of student *i.* X_i is a vector of individual characteristics (gender, age, age2, the total duration of the survey, countries, department, course, course department, current residence, education of both father and mother, aversion risk, past experience of experiments in Essex Lab and occupational status of both father and mother and others). T is a binary

variable that takes a value of one if student *i* has been assigned to the treatment group (this group watched motivational pictures and videos) and zero otherwise; u_i is an error term capturing idiosyncratic shocks or unobserved student i characteristics. The coefficient β_1 captures the effect of the psychological theory called priming: hence, this coefficient measures the average impact on student performance.

We first focus on total score that students have taken solving the IQ test in the survey. OLS estimates are reported in table 1.2. Standard errors, t-value, p-value and confidence intervals are even reported, while in this way **** p<.01, ** p<.05, * p<.1* we show if a variable is significant, for each significant percent level. Bootstraps will be presented in the appendix section.

As it can be observed in column I of table 1.2, ceteris paribus, who received the treatment of priming increases his final score by 2.140 points, with 0.862 robust standard errors. The coefficient is significant at the 5 percent level. Other variables that should affect the performance, such as the education of parents are not significant. Moreover, we checked for past experience in experiments, but even this variable is not significant. This is a very good result because it means that students have not been influenced by previous experiments, the experience accumulated in the past has had no impact on this experiment. Demographic variable and the personal characteristics are also not significant. In addition, the coefficients of aversion risk is so small that they are close to zero and even not significant. An exception is the dummy variable for university attended which shows that Essex students perform better than Calabrian students do. This was actually expected since randomisation took place at university level due to language differences in the surveys administered. Furthermore, the admissions policies are very different as the University of Calabria has no barriers to entry and tuition fees are much lower.

Table 1.2: OLS Regression

VARIABLES	(I) Final Score	(II) Effort	(III) Correct Answer
Treated	**2.140****	**2.474*****	**2.757****
	(0.862)	**(0.877)**	**(1.321)**
Gender	0.00459	0.192	-1.322
	(0.879)	(0.896)	(1.345)
Age	0.987	0.913	1.803
	(1.069)	(1.082)	(1.707)
Age2	-0.0122	-0.0107	-0.0252
	(0.0196)	(0.0198)	(0.0319)
Father Education	-0.568	-0.597	-0.587
	(0.423)	(0.438)	(0.649)
Mother Education	0.169	0.166	0.211
	(0.380)	(0.396)	(0.609)
Father Occupation	0.149	0.120	0.507
	(0.394)	(0.399)	(0.615)
Mother Occupation	-0.0176	0.0362	-0.271
	(0.388)	(0.403)	(0.617)
Risk Aversion	0.000902	-0.00057	0.0010
	(0.013)	(0.014)	(0.021)
University	2.762***	3.155***	2.523***
	(1.768)	(1.821)	(2.666)
Course Department	0.0149	0.0159	0.00269
	(0.0221)	(0.0234)	(0.0308)
Past Exper	-0.938	-1.069	-0.933
	(0.891)	(0.907)	(1.379)
IELTS Certif	-0.653	-0.423	-0.166
	(0.865)	(0.880)	(1.318)
Observations	240	240	240

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

Column II in table 1.2 shows a new dependent variable called effort, which is constructed as the sum of the answer attempted by the student *i.* In this way, we want to estimate the effect of the priming on the effort, in order to see if a student, affected by motivational pictures and videos, increases the number of answers given in the IQ quiz. We decided to consider the number of answer attempted as the effort of student *i.* The results of the OLS linear regression clearly show a positive coefficient of 2.474 for the binary variable Treated. Treat group, on average, answers 2.474 more questions than the control group, the p-value is significant at 1% level. The positive coefficient shows a difference between the two groups, hence the treatment has influenced the effort of the students to answer more questions, and to complete the IQ test. Therefore, the motivational pictures and videos affected the

cognitive system of the participants of the experiment. We saw how the administered treatment was positive and significant in relation to both Final Score and Effort variables. As we have already said, the IQ test questions had different scores depending on the difficulty and complexity of the question itself. Therefore, we are going to see if, on average, the treated group answered more correct questions than the control group.

Column III in table 1.2 shows another OLS regression, which has as a dependent variable the correct answers given by the students in the IQ test. The correct answers variable is constructed as the sum of the correct questions of the student *i.* Here, as we can see, the treat variable is positive, the coefficient is 2.757 with robust standard errors (1.321), and significant at a level of significance of 5%, so we find a same significance in the number of correct answers compared to the total score. Ceteris paribus, who has received the treatment increases the number of correct answers given by 2.757 compared to who has not received the treatment. Having questions with different values, this regression could also bring different results. If in this regression the treat variable was not significant, the group of treats could also answer the same amount of correct questions and still get a higher score. However, as we can see, the treatment was significant and it means that the treatises put more effort into the questions and focused more on getting a better result. This reinforces our hypothesis that the psychological theory of priming, acting on the cognitive system, allows the recipient to focus on the target and produce a better performance. This hypothesis is supported as we have seen in the literature, where many made experiments produced a change in the behaviour of individuals, all this without any monetary cost but using the technique of non-monetary incentives and this theory that behavioural economics has allowed us to study.

1.6) Empirical Results for Placebo Experiment

In order to be sure that this is identity priming, we repeated the experiment with working university graduates who had finished their studies as students. This was done to differentiate identity priming

from normal priming aimed solely at stimulating the cognitive system through images and videos. In fact, the images and videos shown represent the successes and achievements of a student's life.

In order to test this prediction we conducted the same experiment as described above on 120 workers who had previously attended the two universities mentioned above. The Qualtrics system was also used. Table 1.3 shows the variables we collected and used for the analysis. It can be seen immediately that all the performance indicators of the workers are lower than those of the students, probably because the images and videos did not stimulate the cognitive system of the workers.

Table 1.3: Descriptive Statistics of the sample of graduate workers

Variable	Mean	Std. Dev.	Min	Max
Gender	.593	.493	0	1
Age	29.88	3.65	23	47
Father Education	3.08	1.09	1	7
Mother Education	3.08	1.174	1	7
Father Occupation	2.576	1.374	1	4
Mother Occupation	2.542	1.245	1	4
Risk Aversion	63.249	73.115	0	100
University	0.671	0.554	0	1
Past experience	.237	.427	0	1
Final Score	3.45	5.22	0	30
Correct Answer	3.966	5.45	0	30
Effort	6.69	9.253	0	30
Treated	0.474	0.501	0	1

Table 1.4 shows exactly that the two groups of workers - treated and controlled - are statistically identical. In column (I) we see the final score, in column (II) the effort, i.e. the number of questions attempted, and in column (III) the number of correct answers given. All 3 columns show that the cognitive system of the workers was not affected, confirming our thesis that this is identity priming, and in our specific case Student Identity Priming.

Table 1.4: OLS Regression for Workers

VARIABLES	(I) Final Score	(II) Effort	(III) Correct Answer
Treated	**-0.837**	**-0.311**	**-0.0543**
	(1.05)	**(0.223)**	**(0.064)**
Gender	0.866	0.0805	-0.0322
	(1.037)	(0.226)	(0.0345)
Age	-0.761	-0.340	-0.075
	(0.679)	(0.157)	(0.0356)
Age2	0.0098	0.0045	0.00252
	(0.00982)	(0.00223)	(0.00319)
Father Education	-0.792	-0.05	-0.0287
	(0.528)	(0.126)	(0.0349)
Mother Education	0.993	0.166	0.0211
	(0.521)	(0.116)	(0.0609)
Father Occupation	0.780	0.220	0.0307
	(0.375)	(0.299)	(0.0615)
Mother Occupation	0.284	0.0262	-0.00271
	(0.488)	(0.103)	(0.0117)
Risk Aversion	0.0036	0.00157	-0.00010
	(0.0031)	(0.00064)	(0.00021)
University	1.292	0.198	0.0523
	(0.694)	(0.121)	(0.0566)
Past Exper	-0.44	-0.769	-0.933
	(1.4)	(0.907)	(1.279)
IELTS Certif	-0.424	-0.321	-0.33
	(0.743)	(0.880)	(0.918)
Observations	120	120	120

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

1.7)Conclusion

In this chapter, we used the theory of identity priming, stimulating student category membership in 240 participants from two different universities. This was done in order to evaluate the effects on academic performance and effort. Our results show that the exposure to imagines and videos designed to make their identity as students more salient increases effort and IQ test scores. This theory has been used in stark contrast to monetary incentives, which are very often used to achieve the same performance-enhancing objectives. We have seen the advantages of non-monetary incentives, one of which is certainly the absence of the crowding out phenomenon. This work has allowed us to detect a real effect of priming on student performance. The biggest limit of the experiment is certainly the very small sample, but an attempt was made to limit this problem with non-parametric analysis and the use

of the bootstrap instrument (in appendix). It would be interesting to repeat the experiment with a larger sample to get more information on this theory, if indeed the identity priming can be used for academic purposes it would certainly be a very useful tool. Any opportunity to increase student performance should be considered, especially if it is a cost free tool.

Appendix

One limitation of the experiments is the use of a small sample. In fact, it is not always possible to have a high number of participants. Therefore, some econometric tools are used to correct this problem. In table 1.9 of the appendix, we have estimated the OLS regressions with the non-parametric analysis tool called bootstrap. As shown, using 10000 replications the dummy variable that identifies the group is significant at 5% level for both the final score and the correct answers given by the students, and at 1% level for the effort variable, thus confirming the previous regressions shown in table 1.2.

Table 1.5: Bootstrapping OLS

VARIABLES	(I) Final Score	(II) Effort	(III) Correct Answer
Treated	**2.140****	**2.474*****	**2.757****
	(0.862)	**(0.8771)**	**(1.321)**
Gender	0.00459	0.192	-1.322
	(0.879)	(0.895)	(1.3449)
Age	0.987	0.913	1.803
	(1.269)	(1.084)	(1.7073)
Age2	-0.0122	-0.0107	-0.0252
	(0.0216)	(0.0198)	(0.0319)
Father Education	-0.568	-0.597	-0.587
	(0.425)	(0.438)	(0.649)
Mother Education	0.169	0.166	0.211
	(0.381)	(0.396)	(0.609)
Father Occupation	0.149	0.120	0.507
	(0.392)	(0.399)	(0.615)
Mother Occupation	-0.0176	0.0362	-0.271
	(0.383)	(0.403)	(0.617)
Risk Aversion	0.000902	-0.00057	0.0010
	(0.0131)	(0.014)	(0.021)
University	2.762***	3.155***	2.523***
	(1.766)	(1.821)	(2.666)
Course Department	0.0149	0.0159	0.00269
	(0.0221)	(0.0234)	(0.0308)
Past Exper	-0.938	-1.069	-0.933
	(0.891)	(0.907)	(1.379)
IELTS Certif	-0.653	-0.423	-0.166
	(0.865)	(0.880)	(1.318)
Observations	240	240	240

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) bootstrap standard errors reported.

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Chapter 2

Gender-based violence and female labour market participation: the effect of increased employment on reports of sexual assault.

Abstract

We analyse whether an increase in women's employment through government incentives has led to a reduction in gender-based violence. The results show that greater socio-economic independence leads to a reduction in gender-based violence.

Keywords: Gender-Based Violence, Women's Labour Market, Monetary Incentives

2.1) Introduction

Women's participation in the labour market and gender-based violence are two of the most widely discussed topics in the literature. They are also often interconnected. The aim of this paper is to evaluate the impact of some incentives to hire women who have already been victims of violence, and to assess whether this policy has led to changes in sexual violence reported by the authorities.

The literature concerning this relationship is very large and diverse. Anderson (1997) suggests that gender interacts with the structures of race, marital status and especially socioeconomic status to influence power within relationships and the propensity for domestic violence. Indeed, when working hours are equally distributed between spouses, the role of breadwinner is often shared (Greenstein, 2000), and when a woman's role is recognised as equal, violent attitudes on the part of her partner should not occur. The employment status of women is therefore important, because it grants the autonomy that allows women to remove themselves from violent situations. However, on this point the literature is divided. On the one hand, some studies argue that economic dependence on the husband increases the likelihood of violence (Choi and Ting, 2008) or moreover, if the woman works, this increases the likelihood of violence (Heath, 2012). On the other hand, other studies claim the opposite, that economic autonomy and an active working status reduces the likelihood (Bowlus and Seitz, 2006), (Chegere and Karamag, 2020).

This work is part of the literature that supports women's economic independence as a factor in reducing gender-based violence. To support our initial hypotheses, we analysed the effects of incentives given by the Italian government to some companies to hire women victims of gender-based violence.

On December 27th 2017, the Gentiloni government approved the budget law for the following year. Article 1 of Law No. 205 of 27 December 2017, paragraph 220, establishes a fund of €1 million for the 3 years 2018, 2019 and 2020 for the recruitment on open-ended contracts, by social cooperatives, of women victims of gender-based violence. These funds are guaranteed by way of relief from the

compulsory social security and welfare insurance rates due to the aforementioned hired women. The violence must be certified by an anti-violence centre or shelter. The Budget Law came into force on 1 January 2018, so these funds are immediately available on this date for social cooperatives. This is the first direct intervention in Italian jurisprudence aimed at increasing the labour market participation of women victims of gender-based violence.

In the first step, we focus on the impact of the law on the recruitment of women in co-operative societies. For policy evaluation we use ISTAT data on the annual labour market survey, the data runs from 2016 to 2018, so we only have the possibility to analyse one year post-reform, as in 2019 the annual survey does not contain our key variable that distinguishes social cooperatives from other enterprises. Moreover, in order not to fall into problems of underestimation, only individuals who found a job in the same year of interview will be considered. In the second step, we analyse data from the Italian Department of Public Safety from 2016 to 2019 on violence, aggregated at the provincial level. This second step is to check whether, in those provinces where cooperative societies are widespread, sexual violence has decreased in the post-reform period. First results show an increase in the female workforce in social co-operatives in the year the incentives were granted. In the same period, in those provinces with a high number of social co-operatives a reduction in rates of sexual violence is estimated.

The paper is divided as follows. In the next section we discuss the existing literature on gender-based violence and female labour market. In section 2.3 we analyse the Italian frame on reforms to increase female employment. In section 2.4 we describe data and methodology. In section 2.5 we show the results. Finally, in section 2.6 we draw our conclusions.

2.2) Literature Review

Gender-based violence and the reduction of the gender gap, with the increase of women's employment, are highly studied and interlinked topics. Gender-based violence includes all behaviours of coercion or dangerous deprivation of life directed at women. Among the many are included, sexual

violence, murders, inducement to prostitution, spousal violence and many others. Gender-based violence also includes all verbal violence towards a woman or girl (Heise, Ellsberg and Gottmoeller, 2002). According to recent WHO estimates, one third of the world's female population have been victims of gender-based violence in their lifetime, both physical and sexual (World Health Organization, 2020). Obviously, Covid has worsened the situation and it has caused an increase in the exposure of women to violence (John, Casey, Carino and McGovern, 2020). The covid has also affected the gender gap, and reducing it may take longer and be more difficult (Profeta, 2020). Formerly, the impact of the crisis and austerity policies have shown increased female participation in the labour market, but little likelihood of reversing the trend in wages. This is also due to policies aimed at reducing contractual protections for workers (Rubery, 2015). Fagan and Rubery (2017), point out that the European Employment Strategy has been very successful in increasing female labour market participation. However, these improvements have come to a standstill due to political clashes between neo-liberal macroeconomic manoeuvres and European social models. The study also underlines that gender equality principles are often used for opportunistic purposes and abandoned once economic goals are achieved. Nevertheless, politics cannot see the gender gap as a problem to be used for opportunistic purposes and hope that it will be solved by economic growth. Indeed, it is not possible to rely on the equalising effects of economic growth to reduce the gender gap in the labour market. Especially in developing countries, active labour policies are needed to increase women's participation in the labour market (Luci, 2009).

There are many active policies used for this purpose over the years. Balkan, Baskaya and Tumen (2016) analysed a female employment incentive programme that was adopted in Turkey in 2008. It is a subsidy programme for younger men and women of all ages. From this government policy, it can be seen that it is mostly older women with low education rather than highly educated women who benefit from increased employment. The effect is slight for younger women and not significant for younger men. In India in 2006, the NREGS, an anti-poverty plan, was enacted. The NREGS consisted of guaranteeing 100 days of unskilled labour to rural households, specifically, one third of individuals had

to be women, and this created a positive shock on female employment and allowed India to reduce the gender gap (Amaral, Bandyopadhyay and Sensarma, 2015). The active policy we are interested in is the change in the tax wedge. A reduction in the tax wedge through reductions in taxes or social security contributions increases the demand for labour and consequently increases the employment rate (Hodge and Hickman, 2018). This is a tool widely used by governments to increase the FLP, through incentives that reduce the cost of female labour. In 1971, in Sweden, the average tax rate facing the housewife was a function of the income of her husband. A tax reform enabled Sweden to reach the 2007 OECD average level of female labour market participation already in 1974. Without this reform in 1975, female employment would have been 10% lower (Selin, 2014).

With policies in place to increase female labour market participation, the literature is divided on the effects this increase generates on gender-based violence. First, Macmillan and Gartner (1999) finds that if both spouses work then the likelihood of violence is minimal due to the reduction in economic stress. However, the likelihood of violence increases if the woman is employed and the man is unemployed. In this case, there is a change in the relationship between man and woman that is significant in increasing the probability of violence. Hence, relationships within the family change, as the economic and social independence acquired by women entering the labour market changes the wife-husband balance. Moreover, Heath (2012) finds a positive correlation between work and domestic violence. Results from a dataset in Dhaka, Bangladesh, are persistent for women with a low level of education or who married young. These results, however, are inconsistent with some of the literature on work in response to economic shocks, or underreporting of domestic violence.

Another part of the literature, Bowlus and Seitz (2006) who find in their study that workers are less likely to be abused by their spouses, describe different results. However, there is a causal effect of employment on abuse, but there is no causal effect of abuse on employment because most women who have experienced violence have lower levels of education, and also come from families with experience of violence. In addition, Chegere and Karamagi (2020) using a dataset from the Tanzania National Panel Survey and applying the propensity score matching technique, estimate the impact of

IPV (Intimate Partner Violence) on women's employment probability. Study's results shows that IPV is a catalyst for self-employment for women, which can improve their bargaining power. Tenkorang (2018), a study conducted in Ghana, highlights how the use of programs aimed at increasing women's empowerment can reduce partner violence. An economic intervention aimed at improving financial autonomy, can improve the couple's relationship and reduce domestic violence.

Thus, the literature offers a number of discordant results on the figure of the female workers and the likelihood of her experiencing violence. Enswaran and Malhotra (2011), describes that an increase in job opportunities for women can lead to an increase in domestic violence. The study indicates that a higher employment rates for women is not sufficient to prevent violence. Therefore, it suggests expanding the number of shelters for battered women and timely enforcement of laws. The Italian government, with the rule contained in the budget law that we will soon describe, seems to give a solution to both the situations described above. In fact, the law provides a targeted intervention to those women who follow a path in an anti-violence center. Hence, the goal is not just to increase the female employment rate, but it sets a clearer objective, that of giving greater economic independence to a category that often has little autonomy, in order to escape from the violence already suffered in the past. Therefore, it is not intended to create economic autonomy for women within the family, which may not be enough to prevent physical violence and increase their decision-making power (Ismayilova, Karimli, Gaveras, Tô-Camier, Sanson, Chaffin and Nanema, 2017). The goal is to empower women who are already victims of violence financially so that they can decide to leave a violent family situation, or move away from partner and other violent situations.

2.3) The Italian Frame

Over the years, several laws have been enacted in Italy to help reduce the unemployment rate due to the recessions of the last decade. In particular, let us look at the initiatives in favour of women's employment with the ultimate aim of reducing the gender gap.

Monti government, with Law 92/2012, established the introduction of incentives for companies that hire women of any age, who have not been employed for at least 24 months. After this reform, the 2013 ISTAT data show that, the employment rate of women aged 15-64 stood at 46.5 per cent, 12.2 points lower than the EU28 average. During the crisis, men's employment declined sharply, while women's employment did not decline much. In 2013, women aged 15 years and older in employment in 2013 were 9 million 330 thousand, 11 thousand less than in 2008, and the employment rate employment rate 15-64 years old dropped by only 0.7 percentage points. ISTAT (2014)

It is interesting to see which Italian regions have been fastest in reducing the gender gap. Belloc and Tilli (2012), point out that the most virtuous region for this topic is certainly Veneto; in fact, their data show the fastest convergence of unemployment rates. On the other hand, the southern regions, in the period they analysed, between 1992 and 2009, show a convergence between the two rates, but with very low coefficients. These data are not surprising given the high unemployment rate in southern regions, but it is interesting to understand how the law we have analysed, which encourages the employment of women on open-ended contracts, favours certain companies, i.e. social cooperatives, which are mainly located in the south of the country.

Certainly, the most famous is the law issued in 2014 by the Renzi government, called Jobs Act. Early studies by Fana, Guarascio and Cirillo (2015) show that this manoeuvre failed in its main objectives in the first year, such as the reduction of the unemployment rate and the reduction of some atypical and complex contracts. In its complexity, this law includes greater protections for female workers in order to reduce the persistent gap that still exists. In particular, the interesting passage of this law, in its implementing decree, is the introduction of a 3-month leave for female employees who are victims of gender-based violence and have been included in protection programmes. As we can see, unlike the law we studied, which provides incentives for hiring women victims of violence, the jobs act adds rights to this category but does not stimulate an increase in employment.

However, the jobs act has the merit of introducing the debate on women victims of violence, who after years of struggle by associations receive guarantees in the workplace. Therefore, we can consider the jobs act as a pioneer for the protection of these subjects. Hence, the legislation contained in the 2018 budget law goes to complete the path started by the Renzi government, through tax relief for social cooperatives that decide to hire on permanent contracts women victims of gender-based violence who have started a path in a shelter or an anti-violence centre. It should also be noted that a complaint by the victim is not required to access these incentives.

Government is obliged, by means of a budget-type accounting document, to inform Parliament of the public expenditure and revenue forecast for the following year. Since 2016, the Budget Law and Stability Law form a single text. In 2017, the Gentiloni government passed the Budget La, including a provision for women victims of gender-based violence. The new law not only protects women victims of violence, but also tries to stimulate employment in this category. Article 1 of Law no. 205 of December 27th 2017, in comma 220, establishes a fund of 1 million euros for the 3 years 2018, 2019 and 2020 for the permanent hiring, by social cooperatives, of women victims of gender-based violence. These funds are guaranteed by way of relief from compulsory social security and welfare insurance rates due in respect of the above-mentioned recruited women workers. The violence must be certified either by an anti-violence centre or by a shelter. The Budget Law came into force on January 1st 2018, so these funds are immediately available on this date for social cooperatives. To be hired and to use this fund, there is no need for ongoing legal proceedings for any crime related to gender-based violence.

Moreover, the implementing decree of May 11th 2018, issued by the ministry of labour and social, provides further criteria for accessing the funds. In particular, it underlines how social cooperatives can access these funds by hiring women who are included in a protection pathway by shelters or anti-violence centres. In addition, it is recognised that the cooperatives are exempt from the payment of all social security contributions cooperatives, up to a maximum amount of EUR 350 on a monthly basis.

Premiums and contributions to the National Institute for Insurance against Accidents at Work (INAIL) are excluded.

2.4) Data and Methodology

2.4.1) ISTAT Dataset

The dataset analysed for our research is the ISTAT Quarterly Labour Force Survey. For study purposes, we had to use cross-sectional and not longitudinal data because the first category of data contains a key variable, namely the classification by ATECO code of the company for each individual. This allowed us to distinguish social cooperatives from the rest of the enterprises. The longitudinal data did not allow us to carry out our research, but since it is a representative sample of the population, this dataset is suitable for our aim.

The Labour Force Survey is a continuous survey and provides disaggregated estimates for the main socio-demographic characteristics. This is the main reason why we chose to use this dataset, because of the accuracy of the socio-demographic characteristics, which are crucial for our analysis.

Table 2.1 shows the descriptive statistics of our ISTAT sample. We have cut many observations in order to avoid underestimation problems in the analysis. Let us explain in more detail; the court analysed refers to 3 years of surveys from 2016 to 2018. In this survey, individuals answered questions such as: In what year did you get your current job? Obviously, we find workers, who have been doing the same job for 10 years and likewise there are newly hired workers.

What we are interested in for our analysis are precisely the newly hired workers, to assess whether women in 2018 obtained a permanent contract in social cooperatives compared to men. However, we could still have fallen into the problem of underestimation. It is very intuitive to understand that the 2018 respondents may have found a job in 2016 and 2017, but those hired in 2018 may only have been interviewed in 2018. Hence, the sample contains individuals interviewed in the year they found a job and unemployed.

Table 2.1: Descriptive Statistics ISTAT data

Variable	Mean	Std. Dev.	Min	Max
Year	2017.028	.807	2016	2018
N. Family Members	3.179	1.246	1	13
Age Groups	2.642	1.228	1	5
Region Groups	2.495	1.275	1	5
Province	45.322	30.198	1	106
Fulltime	.686	.464	0	1
Marital Status	1.558	.778	1	6
Education	4.389	1.2	1	6
Parent	.752	.432	0	1
Citizenship	.839	.368	0	1
Female	.472	.499	0	1
Open-ended Contract	.289	.453	0	1
D Social Cooperative	.056	.23	0	1

Table 2.1 highlights the main variables we have analysed. As already mentioned, the courts examined are 2016, 2017 and 2018, i.e. the two years before the reform, and 1 full year post-reform, as the law came into force on 01/01/2018. The year 2019 was also available, but for this year, there was no company identification variable, so we only have one year to assess the impact of the policy. We considered personal information about the individual for our regressions, and about the type of contract in place. The variable of the year of recruitment (not reported) was very important as mentioned above to avoid the problem of underestimation, and to have a well-distributed sample in the three reference years. Two fundamental variables describe the type of contract, they are two dummy variables that specify whether the employee has an open-ended contract or not, and whether he/she has a full-time or part-time contract. The first of the two variables is our dependent variable that we will analyse.

Another fundamental variable is D Social Cooperative, a binary variable with value 1 if the company is a social cooperative and 0 otherwise, will be crucial for interactions. In addition, we consider the variables describing the background of the worker. We find for example gender, and note that women represent 47% of the sample, and 75% of the individuals have at least one child.

Then we have the region of belonging grouped in five macro areas, the citizenship, which tells us that 84% of the workers have Italian citizenship, the province, the education divided into six classes and the

age divided into 5 classes, in the dataset there are only individuals of working age. The average age is therefore between 25 and 34 years

A clarification is necessary with regard to the provinces; there are 106 out of 107 Italian provinces. This is because over the years the provinces of Sardinia have been changed several times, in fact in recent years as many as four Sardinian provinces have been grouped into a single province called South Sardinia. The ISTAT surveys are therefore influenced by these changes. In addition, here, in order to avoid problems of overestimation of the Sardinian provinces with respect to the other Italian provinces, we decided not to take into consideration South Sardinia.

2.4.2) Data from the Italian Department of Public Safety

Table 2.2 provides some descriptive statistics of second dataset used. This dataset was constructed using panel data from the Italian Department of Public Safety from 2016 to 2019. All crime types by province are reported in aggregate form, so that we have created the distinction between sexual violence and all other crimes. In addition, we used data from the Ministry of Economic Development concerning social cooperatives in 2016, also aggregated on a provincial level. We also use data on unemployment rates, average population and education rates taken from ISTAT surveys. The average number of co-operative societies per province is 188 with a minimum of 28 and a maximum of 1287. The annual provincial average of sexual assaults is 43.74 and is 0.2% of total crimes per province from 2016 to 2019. We aggregated the regions into three macro-areas; North, Central and South. The average percentage of non-graduates in the provinces is 38.77%. Finally, we find both the average provincial population and the aggregate employment and unemployment rates for men and women. The last two variables, the ratio of sexual assaults to total crimes, and the ratio of sexual assaults to the average provincial population, are used as dependent variables in the regressions.

Table 2.2 Descriptive Statistics Italian Department of Public Safety data

Variable	Mean	Std. Dev.	Min	Max
Social Cooperatives	188.114	194.043	28	1287
Sexual Violence	43.74	62.409	1	481
All Crimes	22696.562	34842.131	2236	237365
Year	2017.5	1.119	2016	2019
Non-Graduates Percentage	38.777	6.495	28.8	51.6
Region Class	1.648	.817	1	3
Population	563555.49	611893.66	83590.5	4261492.5
Unemployment Rate	11.258	5.896	2.893	28.962
Male Unemployment Rate	10.081	5.728	2.146	28.295
Female Unemployment Rate	12.936	6.424	3.558	34.195
Employment Rate	58.675	10.35	35.837	74.05
Male Employment Rate	67.603	8.654	44.497	80.558
Female Employment Rate	49.762	12.358	23.356	68.141
Sexual Violence/Crimes	.002	.001	.001	.006
Sexual Violence/Population	.000076	.000031	.000014	.000262

Figures 2.1, 2.2 and 2.3 show the frequency of sexual violence in the provincial areas. As can be seen, two provinces are missing in the dataset: Barletta-Andria-Trani and Sud Sardegna. On these two provinces, we do not have data on cooperative societies.

Figure 2.1: SV 2016

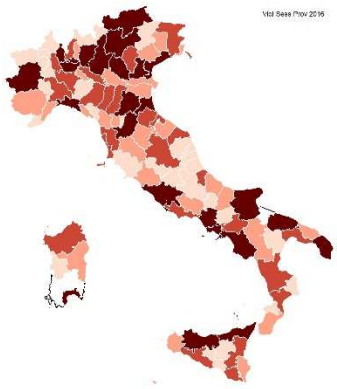


Figure 2.2: SV 2017

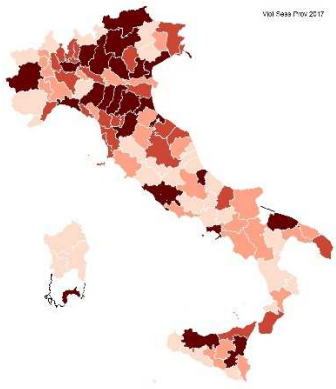


Figure 2.3:SV 2018

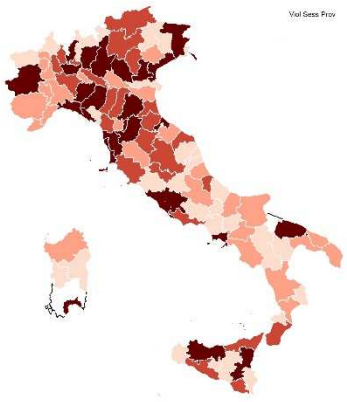


Figure 2.1 describes the situation in 2016, Figure 2.2 in 2017 and Figure 2.3 in 2018, i.e. in the first year of the reform.

Methodology

Generally, the Regression-Discontinuity Design is used to evaluate a policy. When we have a binary exogenous variable, we assume that the individuals on the left and right at the discontinuity point are comparable and therefore any differences in average outcomes between individuals on one side or the other can be attributed to treatment. (Hahn, Todd and Van Der Klaauw, 2001).

However, our data set does not allow us to use this technique for one main reason, which we will explain. First, we reduced the sample to only those individuals who had found a job in the year of the interview. That is, only those individuals *i* interviewed in 2016 who found a job in the year 2016, those individuals *i* interviewed in 2017 who found a job in 2017, and those individuals *i* interviewed in 2018 who found a job in 2018 are considered.

Thus, with a monthly time axis, the RDD would have been ineffective, and we would have overestimated the results. The reason is quickly explained with an example. Individuals hired in December 2017 can only match with 2017 respondents. We then have a sample of progressive growth from January to December, and applying the RDD technique with the cut-off set at December 31, we would have obtained a discontinuity each year. This would have invalidated the data and thus the RDD method is not applicable to our analysis.

Therefore, we used the two-step probit selection model by Heckman (1979), widely used in the literature on women's particpation in the labor market (Eckstein and Wolpin, 1989), (Martins, 2001). The model can be adapted to our binary variable Open-ended contract. (Butler, 1999).

$$Y_i^* = \beta_0 + \beta_1 t + \beta_2 dCoop_i + \beta_3(t + dCoop_i) + \beta_4 X_i + u_i \qquad (2.1)$$

$$Z_i = 1 \; if \; = Z_i^* = \beta_0 + \beta_1 W_i + \varepsilon_i$$

$Z_i = 0$ otherwise

Where Y_i and Z_i are the dependent variables, t is the binary variable describing the time of the reform, $dCoop_i$ assumes value 1 for cooperatives and 0 otherwise, X and W are vectors of exogenous

variables. Both dependent variables are binary variables. In the main model, Y_i is the type of contract, 1 for open-ended contract and 0 otherwise. In selection equation, Z_i assumes value 1 if the individual is occupied and 0 otherwise. In the latter model, two important instrumental variables are also added, such as being married and having children, which affect the choice of being employed or not (Mincer, 1962), but do not affect the type of contract, which in the case of employment, they must sign. This allowed the two models to be correlated and the whole model is therefore accepted. The use of these two variables is widespread in the literature, and is taken as an example for a better understanding of Heckman's model.

Moreover, we also estimate with the probit model. However, Norton et al (2004) specify how in the non-linear model with interactions, the insights are not the same as in the linear model.

The conditional mean of the dependent variable is:

$$E\,[y|x_1, x_2, X] \;=\; \Phi(\beta_1 x_1 \;+\; \beta_2 x_2 \;+\; \beta_{12} x_1 x_2 \;+\; X\beta) \;=\; \Phi(u) \qquad (2.2)$$

Φ is the standard normal cumulative distribution. The effect of the interaction is the cross-value derivative of *y*, and from equation 2.3, we can see that the interaction effect is not equal to $\beta_{12}\Phi''$

$$\frac{\partial^2 \Phi(u)}{\partial x_1 \partial x_2} \;=\; \beta_{12}\Phi'\,(u) + (\beta_1 + \;\beta_{12} x_2)\,(\beta_2 \;+\beta_{12} x_1)\;\Phi''\,(u) \qquad (2.3)$$

An important consequence is that the sign β_{12}does not indicate the sign of the interaction effect because the equation has two additive terms, which can have positive or negative signs depending on the value of the covariates. (Norton, Wang and Ai, 2004). This method has been used in many studies, including that of Miller, Rosenheck and Schneider (2012), who investigated the moderating effect of caregiver burden on the relationship between the health status of patients with Alzheimer's disease and their use of institutional services. (Miller, Rosenheck and Schneider, 2012). We will then apply the method of Norton et al (2004) in order to obtain correct estimates using the probit model with interactions.

In the latter part of the analysis, where the Ys will be two ratios we will use the approach of Mundlak (1978), and for robustness, the random effect Tobit model, used in Agostino et al (2021), in order to check for unobserved time-invariant heterogeneity at province level. In this part, we have considered the ratio of sexual violence/population and the ratio of sexual violence/other crimes. These two variables are important to understand the effect of the presence of several social cooperatives on the reporting of violence. In fact, the variable we are interested in is the interaction between time and the number of cooperatives present in the province.

2.5) Empirical Results

2.5.1) Increasing female employment in social co-operatives

Table 2.3 shows the heckprobit model for employed and non-employed women. The results show that women in cooperative societies are more likely to have a permanent contract in 2018.In fact, the interaction variable, which is the variable of our interest, is positive and significant at 1% level.

Table 2.3: Heckprobit Model for Female

VARIABLES	**Open_ended_Contract**
D. Social Cooperative	-0.237***
	(0.0205)
D. Time	-0.00950***
	(0.00199)
D. Social Cooperative x D. Time	**0.0934*** **
	(0.0203)
Fulltime	-0.0567
	(0.0348)
Year	-0.0260***
	(0.00267)
No. Company Loc	-0.000500***
	(8.66e-05)
Citizenship	0.490***
	(0.0413)
Education	0.0549***
	(0.00784)
Age Groups	0.148***
	(0.0143)
	Employed
Married	-0.258***
	(0.0145)
Parent	-0.00303
	(0.00429)
No. Family Members	-0.0179***
	(0.00665)
Region Groups	-0.0773***
	(0.00610)
Citizenship	0.0798***
	(0.0257)
Education	0.102***
	(0.00383)
Age Groups	-0.168***
	(0.0174)
Year	0.0886***
	(0.0164)
Observations	58,096

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses.

It is a result in contrast to the other parameters. In fact, we see that the other two dummy variables, representing cooperative societies and the time of the law's entry into force, are significant but negative. Thus, the effect of government incentives has strongly pushed the hiring of women on permanent contracts in these specific societies. Other variables are significant and in line with the

existing literature. For example, education, which has a positive sign and higher female employment in the northern regions, described by the Region Groups variable due to the high unemployment rate in the southern regions.

Another aim is to assess whether the reform has produced an increase in employment in social co-operatives for women rather than men.

As mentioned above, in non-linear models with interactions, the simple regression results would not have been consistent, so using the method of Norton et al (2004); from the first probit regression, we obtain Table 2.4 and Figure 2.4.

Table 2.4 shows a probit regression model with dependent variable, a dummy variable with value 1 for women with permanent contracts, and 0 for women with part-time contracts, Std. Err. are adjusted for 3 clusters in Year. As we can see, the three variables of interest are all significant by adding the control variables. The provincial dummies have been included in column (III), but are not shown in the table. All three variables of interest are significant at a level of significance of 1%. In particular, the probability of having an open-ended contract for women decreases from year to year. This can be seen from the negative sign of the dummy variable D_time, but also from the negative sign of the variable Year. In addition, we can note that the variable D_Social_Cooperative, which has a value of 1 for social cooperatives and 0 otherwise, has a negative sign, thus the probability of women having an open-ended contract in social cooperatives is reduced by 23% (column III).

Let us now focus on our interaction variable, which is fundamental to our analysis. This variable is also significant at a significance level of 1%. Unlike the other two variables, this interaction has a positive sign. This result makes us understand how the rule in the budget law introduced on 1/01/2018, from the first year, had a positive effect. Other control variables are significant such as Age and Education, which are in line with current literature.

As we can see, the effect of the norm is very strong, looking at the sign of the two dummy variables, and looking at the sign of the interaction variable; we understand that the government's policy to support women victims of violence has been very effective.

Table 2.4: Female Probit Model

VARIABLES	(I) Open-ended C	(II) Open-ended C	(II) Open-ended C
D. Time	-0.0587***	-0.0177***	-0.00843*
	(0.0204)	(0.00206)	(0.00455)
D. Social Cooperative	-0.302***	-0.252***	-0.236***
	(0.00544)	(0.0225)	(0.0409)
D. Time x D. Social Coop	**0.105*** **	**0.106*** **	**0.109*** **
	(0.00544)	**(0.0220)**	**(0.0418)**
Year		-0.0364***	-0.0520***
		(0.000541)	(0.00445)
No. Family Members		-0.0110***	-0.0109***
		(0.00113)	(0.00253)
Age Group		0.163***	0.167***
		(0.0217)	(0.0238)
Region Group		0.0215	-0.0389
		(0.0131)	(0.0372)
Full-time		-0.0619	-0.0452
		(0.0357)	(0.0318)
Marital Status		0.0597*	0.0615
		(0.0355)	(0.0388)
Education		0.0230***	0.0213***
		(0.00790)	(0.0118)
Parent		-0.124***	-0.128***
		(0.0311)	(0.0304)
Citizenship		-0.452***	-0.454***
		(0.0513)	(0.0698)
Observations	10,296	10,296	10,296

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses; (3) In column III dummy provinces are included but not reported.

From Norton et al (2004), however, in order to understand whether the results are consistent, we have to look at the graphs of the regressions. What we have to watch out for is definitely the sign, which may change direction for some observations. Figure 2.4 and Figure 2.5 are graphs describing column III of Table 2.4, with the provincial controls.

What is immediately apparent from Figures 2.4 and 2.5 is the positive sign of the effect of the interaction variable (z-statistics is 2.58). Confirming the sign of the interaction effect is a very good result since with the probit model with interactions the sign could have been the opposite.

Figure 2.4: Interaction effects Female

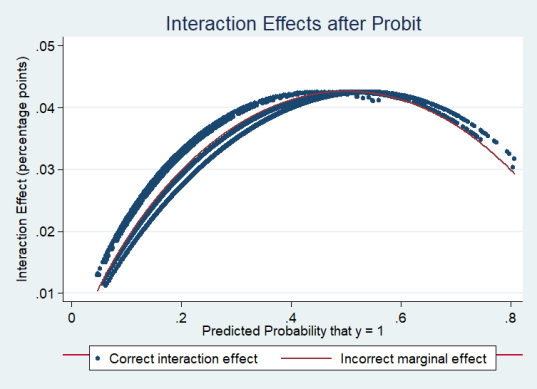


Figure 2.5: z-statistics Female

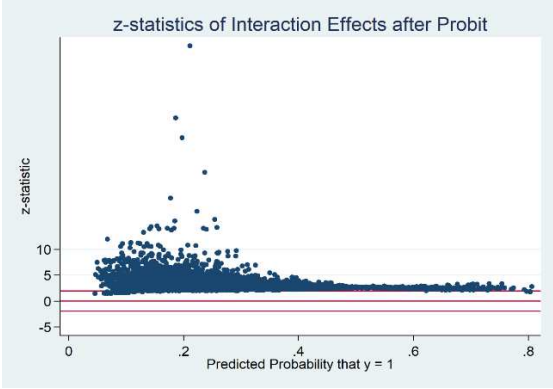


Figure 2.4 and 2.5 are derived using the INTEFF command. In both we find the predicted probabilities for each observation on the x-axis. The first compares the interaction effects calculated using the non-linear method (scatter plot) with those obtained using the linear method (line). The second plots the z-statistics calculated for each observation. Figure 2.4 describes interaction effects after probit models estimation. Figure 2.5 shows significance of the interaction effects.

Figure 2.4 shows an even stronger effect than that identified in Table 2.4. In fact, we see that the interaction effect for women ranges from 12 percentage points to 45 percentage points and varies according to the covariates of the observations.

Moreover, Figure 2.5 shows that the effect of the interaction variable is significant at 1 per cent for a small group of observations. Furthermore, accepting significance at 5 or 10 per cent, the effect on the almost total number of observations is significant. Since the sign recorded is positive, for this group of individuals, these results are in line with Table 2.4, although with a lower significance for most observations.

This is a very satisfactory result. The probit model has been partially confirmed. The results showed that by accepting a significance at 5% and 10% level, the coefficient identifying the effect of the interaction variable could reach peaks of 45% for some observations. Much depends on the covariates influencing the interaction effect. In many studies, the method of Norton et al (2004) disregards the first probit model. Indeed, often the effects of the interaction variable turn out to be opposite to that shown by the probit model, with some observations receiving a positive effect and others a negative effect from the interaction. (See Melgar, 2012). So even with the Norton et al (2004) method, the data are confirmed and consistent. The reform had an effect on the subjects it was aimed at.

Let us see now what happens to men, trying to isolate even more the effect of the incentives present in the budget law that came into force on 01/01/2018.

Table 2.5: Male Probit Model

VARIABLES	(I) Open-ended C	(II) Open-ended C	(III) Open-ended C
D. Time	0.0150*	0.0758***	0.100***
	(0.0144)	(0.00344)	(0.0119)
D. Social Cooperative	-0.499***	-0.473***	-0.501**
	(0.181)	(0.173)	(0.195)
D. Time x Social Coop	**0.0396**	**0.0873**	**0.128**
	(0.181)	**(0.177)**	**(0.202)**
Year		-0.0420***	-0.0608***
		(0.00116)	(0.00610)
N. Family Members		0.0151	0.00850
		(0.0130)	(0.0109)
Age Groups		0.108***	0.112***
		(0.0104)	(0.00997)
Region Groups		-0.0171**	-0.0815***
		(0.00964)	(0.0163)
Fulltime		0.234***	0.245***
		(0.0321)	(0.0316)
Marital Status		0.166***	0.162***
		(0.0285)	(0.0300)
Education		0.0806***	0.0844***
		(0.0127)	(0.0125)
Parent		-0.119*	-0.118*
		(0.0700)	(0.0659)
Citizenship		0.0633	0.0546
		(0.0711)	(0.0709)
Observations	11,505	11,505	11,505

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses; (3) In column III dummy provinces are included but not reported

Table 2.5 shows opposite results for men in some key variables of our analysis. First, in 2018 there is an increase in the probability of having a permanent contract, although the coefficient is quite small. The trend of social cooperatives not to hire permanent workers is confirmed with very high coefficients and significance at the 1% level. The key variable in our analysis, the interaction between the year 2018 and recruitment to social cooperatives is not significant for men. This result confirms the effectiveness of the government's incentive policy for women with gender-based violence. Let us have a look at the other control variables. We note significance for age group and education. In addition, Table 2.5 shows

a higher probability of obtaining a permanent contract in northern regions, and a higher probability that this permanent contract is a part-time contract.

As mentioned above, the probit model with interactions does not give consistent results. Therefore, we also use the method of Norton et al (2004) here.

Figure 2.6: Interaction effects Male

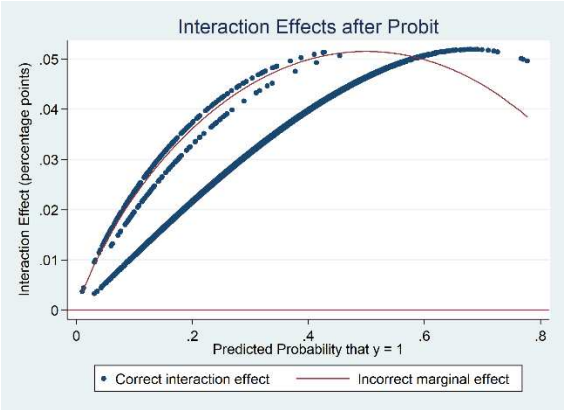
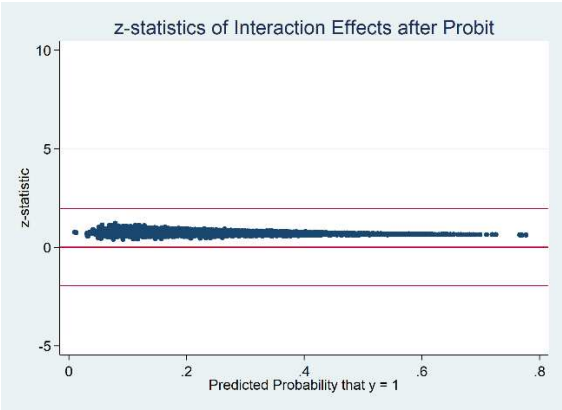


Figure 2.7: z-statistics Male



Even Figure 2.6 shows a stronger effect than that identified in Table 2.5. We can see that the interaction effect for man ranges from 2% to 5.2% and varies according to the covariates of the observations. It is interesting to look at Figure 2.7. The probit model has a z-statistic of 0.64. We can therefore deduce that for some observations the effect of the interaction variable is significant. Therefore, also for men we notice an increase in the probability of obtaining a permanent contract in social cooperatives in 2018. Much depends on the covariates. Obviously, as we can see from the comparison between Figure 2.5 and Figure 2.7, the regulation seems to have a greater impact on women than on men, as we can see from the number of observations whose effect of the interaction variable is significant. Thanks to Norton et al (2004), we are able to obtain consistent results, which overturn the situation of men described in Table 2.5, which recorded a non-significant interaction variable.

For another robustness check look at figures below, that describe the c-plots of the probability of having an open-ended contract in cooperatives (Figure 2.8) and other types of firms (Figure 2.9) in

2018. As can be seen, there is a substantial difference between genders in the different types, which confirms and reinforces our analysis.

Figure 2.8: CI Plot Cooperatives post reform

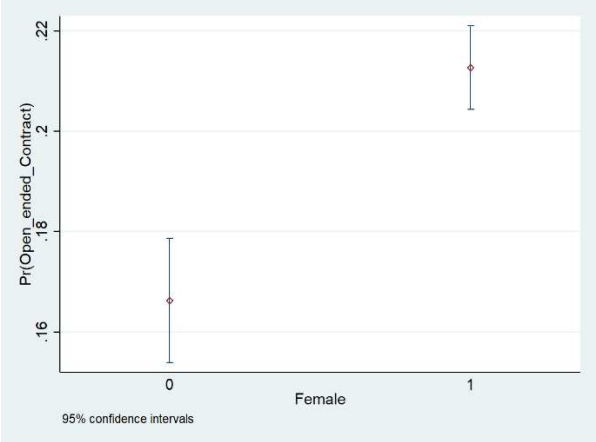
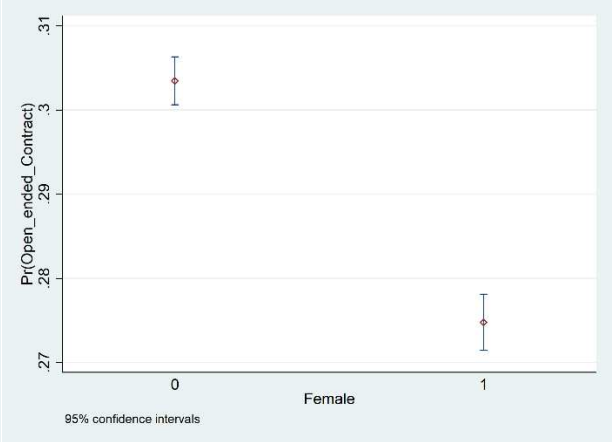


Figure 2.9: CI Plot other firms post reform



Figures 2.10 and 2.11 represent the pre-reform situation. The effectiveness of the incentives for women in cooperative societies allocated for the year 2018 is thus once again evident.

Figure 2.10: CI Plot Cooperatives before reform

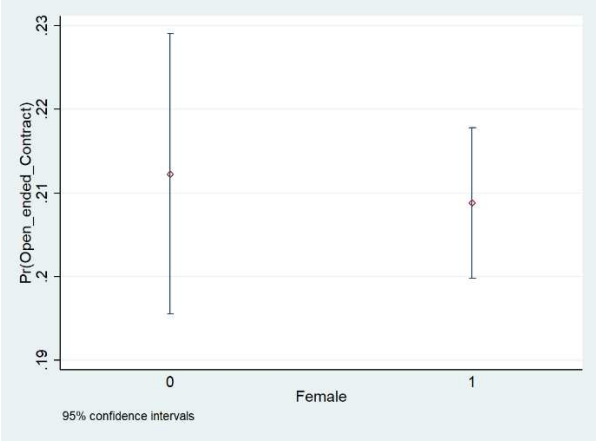
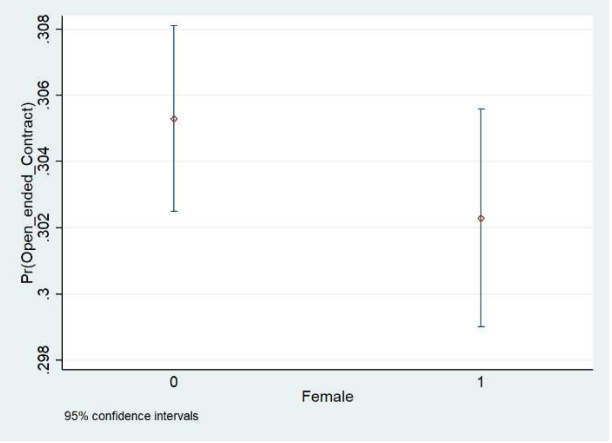


Figure 2.11: CI Plot other firms before reform



2.5.2) Effect on sexual reports

Figures 2.12 and 2.13 highlight the effect on sexual reports in the pre- and post-reform situation. Figure 2.12 shows a decrease in the ratio of sexual violence and other crimes as the frequency of cooperative society's increases. This result is most evident in 2019; one year after the law comes into force. This is because in 2018, more women are hired in cooperative societies, and in 2019 we find evidence of the

effect of monetary incentives on violence. The same applies to the ratio of sexual violence to population. The effects are shown in Figure 2.13.

Figure 2.12: Scatter plots Sexual Violence/Other Crimes and Social Cooperatives

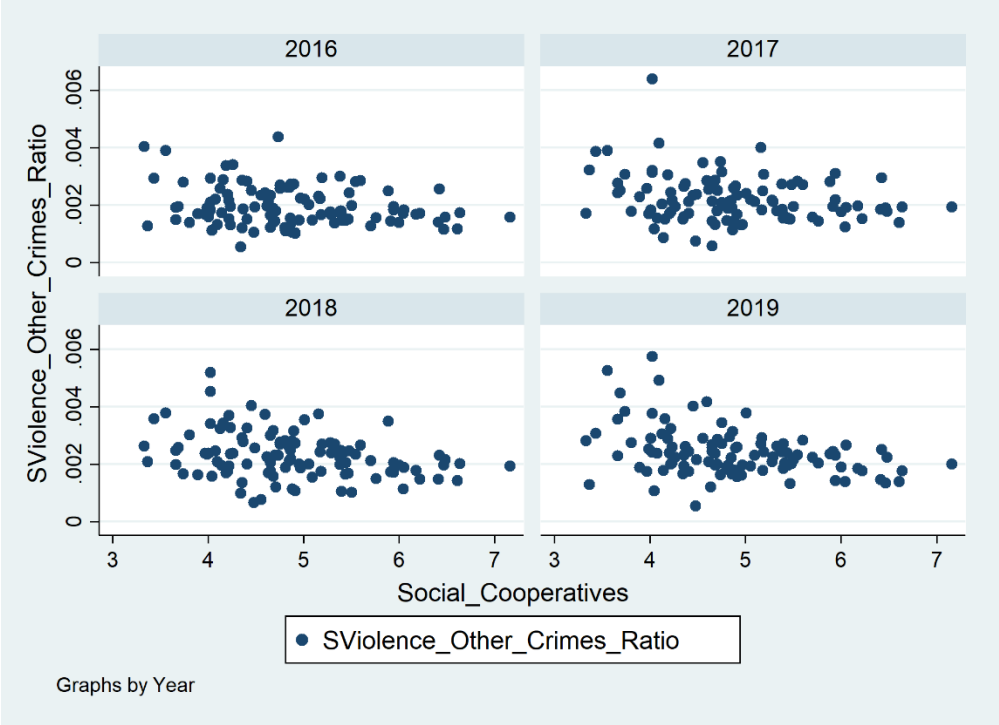
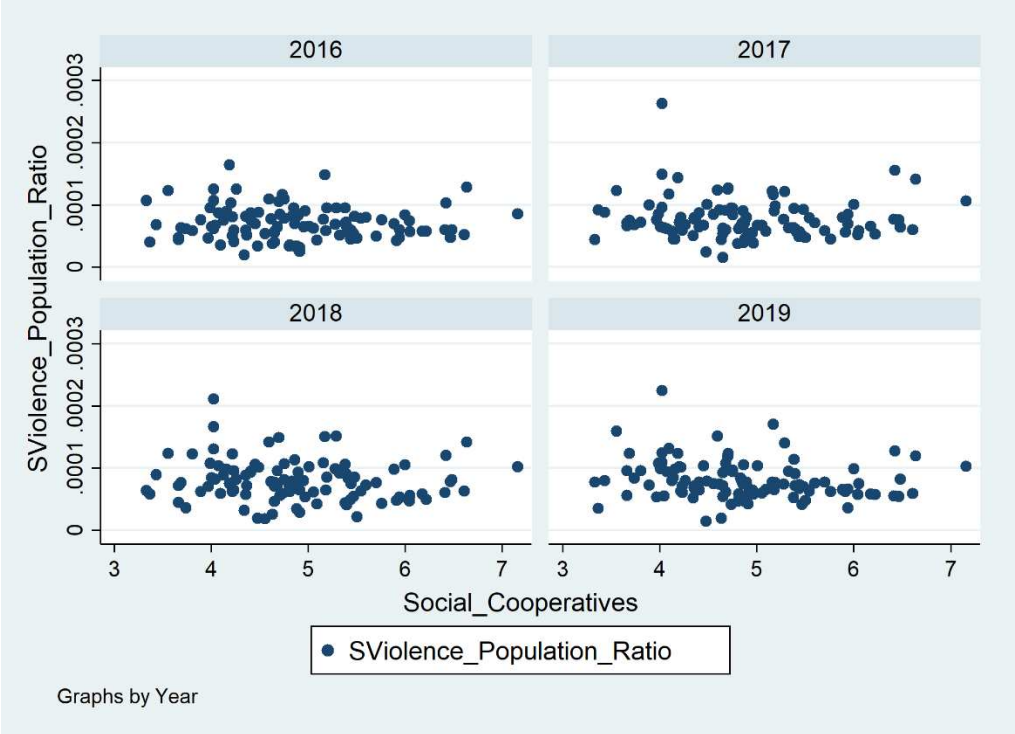


Figure 2.13: Sexual Violence/Population an Social Cooperatives



Outcome 1: The effects of incentives on the ratio of Sexual Violence and Other Violence

In Table 2.6 we present the results of two models, the Mundlak model, in Column (I) and the Tobit model in Column (II). We use these two models because our dependent variables are fractional variables.

The estimated model is the following:

$$Y_{it} = \beta_0 + \beta_1 t + \beta_2 N_{it} + \beta_3 (t + N_{it}) + \beta_4 X_{it} + u_{it} \quad (2.4)$$

Where Y_{it} is the dependent variable, and it is the ratio of the number of sexual assaults to the number of other crimes, t is the binary variable describing the time of the reform, N_{it} identifies the number of social cooperatives in a province i at t time, X is vector of provincial exogenous variables at t time.

Table 2.6: Mundlak and Tobit Model; Sexual Violence/Other Crimes

VARIABLES	(I) Mundlak Model Sexual Violence/Other Crimes	(II) Tobit Model Sexual Violence/Other Crimes
D. Time	0.000840***	0.000842**
	(0.000321)	(0.000330)
Social Cooperatives	0.000101	0.000102
	(0.000182)	(0.000180)
D. Time x Social Cooperatives	**-0.000129****	**-0.000129****
	(.0000608)	**(.0000656)**
Non-Graduates Rate	.0000329*	.0000319*
	(.0000172)	(.000015)
Region Class	-0.000130	-0.000129
	(.0000882)	(.0000841)
Population	-0.000414	-0.000415
	(0.000815)	(0.00114)
Population Mean	0.000168	0.000168
	(0.000848)	(0.00115)
Unemployment Rate	-0.000581	-0.000581
	(0.000320)	(0.000315)
Male Unemployment Rate	0.000421**	0.000421**
	(0.000196)	(0.000190)
Female Unemployment Rate	.0002039	.0002039
	(.0001246)	(.0001273)
Unemployment Rate Mean	.000017	.0000282
	(0.000990)	(0.000835)
Male Unemployment Rate Mean	-.0000648	-.0000717
	(0.000567)	(0.000485)
Female Unemployment Rate Mean	0.000204	.0000314
	(0.000125)	(0003458)
Employment Rate	-.0000533	-.0000504
	(0.000890)	(0.00139)
Male Employment Rate	.0000665	.000065
	(0.000448)	(0.000696)
Female Employment Rate	.0000517	.0000503
	(0.000446)	(0.000696)
Male Employment Mean	-0.000655	-0.000655
	(0.000607)	(0.000770)
Employment Mean	0.00117	0.00117
	(0.00121)	(0.00154)
Female Employment Mean	-0.000572	-0.000572
	(0.000608)	(0.000768)
Number of Provinces	105	105

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

Table 2.6 clearly shows that the first ratio decreases over the years as the number of cooperative societies increases after 2017. In fact, the variable D_Time is a dummy variable, with value 1 for post-reform years and 0 otherwise. The first effect of incentives to hire women victims of gender-based violence in cooperative societies is therefore that of reducing the Sexual Violence/Other Crimes ratio

in those provinces with a high number of cooperative societies. The results are robust and significant at the 5% level. We give more weight to these results by looking at the sign and significance of the variable D_Time. Indeed, we denote an increase in this ratio in the years 2018 and 2019. Looking at the other significant variables, we find that as the male unemployment rate and the non-college graduate rate increase, the dependent variable increases, and so does sexual violence.

Outcome 2: The effects of incentives on the ratio of Sexual Violence and Province Population

In table 2.7, we use as dependent variable the ratio of sexual violence to the average population in the provinces. Models used are the same as the ones above. In Column (I), we find the Mundlak model and in Column (II), the Tobit model.

Table 2.7: Mundlak and Tobit Model; Sexual Violence/Population

VARIABLES	(I) Mundlak Sexual Violence/Population	(II) Tobit Sexual Violence/Population
D. Time	.0000243 **	.0000244**
	(.0000105)	(.0000108)
Social Cooperatives	0.0145	0.0145
	(0.0412)	(0.0444)
D. Time x Social Cooperatives	**-0.0367****	**-0.0367****
	(0.0211)	**(0.0221)**
Other Crimes	-.0000201	-.0000199
	(.0000616)	(.0000696)
Region Class	-.000046*	-.000045
	(.0000026)	(.000034)
Unemployment Rate	-.0000172	-.000019
	(.0000106)	(.0000101)
Male_Unemployment_Rate	.0000137 **	.0000137**
	(.000064)	(.0000609)
Female Unemployment Rate	.0006974*	0.000624
	(.0003914)	(0.000387)
Employment Rate	0.000782	0.000781
	(0.00287)	(0.00446)
Male Employment Rate	-0.000313	-0.000312
	(0.00145)	(0.00223)
Female Employment Rate	-0.000290	-0.000290
	(0.00142)	(0.00223)
Other Crimes Mean	.000033	.0000339
	(.0000702)	(.0000702)
Unemployment Rate Mean	.0000116	.0000116
	(.0000334)	(.0000318)
Male Unemployment Rate Mean	-.0000104	-.0000104
	.0000191	.0000184
Female Unemployment Mean	0.000596	0.000596
	(0.000398)	(0.000324)
Employment Mean	-0.00163	-0.00162
	(0.00389)	(0.00507)
Male Employment Mean	0.000497	0.000495
	(0.00196)	(0.00254)
Female Employment Mean	0.00105	0.00105
	(0.00195)	(0.00253)
Number of provincia	105	105

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

Table 2.7 also shows that our assumptions are correct. In fact, we see the Sexual Violence/Population ratio decreases as the number of cooperative societies increases in the post-reform period. The results are robust to the 5% level of significance. In addition, here the data are strengthened by the variable D. Time, which is positive and significant at the 5% level. Moreover, this ratio is reduced in the central

and southern areas of Italy as shown by the Region Class variable. Finally, as the male unemployment rate rises, the number of sexual assaults on the population increases.

As in the previous table, the dependent variable highlights the effectiveness of the reform and incentives. When hiring on permanent contracts in cooperatives increased, sexual violence decreased in those provinces with a high frequency of cooperatives.

We analysed this data again to perform robustness checks, leaving the panel dimension and using another estimator for fractional variables. We also looked closely at the year that pushed down sexual violence.

Table 2.8: Fracreg Probit Model; Sexual Violence/Other Crimes; Before Reform

	(I)	(II)
VARIABLES	2016	2017
Social Cooperatives	**-0.0206**	**-0.0241**
	(0.0146)	**(0.0127)**
Unemployment Rate	0.0508	-0.140
	(0.103)	(0.107)
Male Unemployment Rate	-0.0272	0.101
	(0.0598)	(0.0626)
Female Unemployment Rate	-0.0185	0.0493
	(0.0436)	(0.0422)
Employment Rate	0.305	0.188
	(0.125)	(0.123)
Male Employment Rate	-0.154**	-0.0954*
	(0.0632)	(0.0605)
Female Employment Rate	-0.149**	-0.0909*
	(0.0627)	(0.0618)
Non-Graduates Rate	0.00157	-0.00550
	(0.00249)	(0.00285)
Region Class	0.00352	-0.0225
	(0.0195)	(0.0173)
Observations	105	105

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

As expected, Table 2.8 confirms our theories. In the pre-reform period there is no evidence that the frequency of cooperative societies in the territory can reduce sexual violence, more specifically reduce the Sexual Violence/Other Crimes ratio. In fact, provinces with few co-operative societies or many co-operative societies are statistically identical. We note some significant variables with negative sign of male and female employment rates.

Table 2.9 shows the post-reform situation. By leaving the panel dimension we are able to isolate year by year the evolution of the reform. As can be seen, the cut-off point is the year 2018, the effectiveness of the law hits in the first year after the reform making the noticeable effects on sexual violence immediately evident. In Column (I) we have the year 2018 and the variable Social Cooperatives is significant at the 5% level with a coefficient of -0.0256. While Column (II) shows that the variable of interest is significant at 1% level and with a coefficient of -0.0417. The effect of incentives and thus the presence of social cooperatives impacts sexual violence in 2018, but in 2019 the impact is greater. This means that the reform is effective in the short term, but persists and increases its strength over the years. As soon as data on 2020 become available, they may further confirm this evidence.

Table 2.9: Fracreg Probit Model; Sexual Violence/Other Crimes; Post Reform

	(I)	(II)
VARIABLES	2018	2019
Social Cooperatives	-0.0256**	-0.0417***
	(0.0108)	(0.0121)
Unemployment Rate	0.0112	-0.166
	(0.102)	(0.133)
Male Unemployment Rate	0.0156	0.0966
	(0.0614)	(0.0759)
Female Unemployment Rate	-0.00882	0.0686
	(0.0396)	(0.0570)
Employment Rate	0.152	0.112
	(0.0944)	(0.119)
Male Employment Rate	-0.0716	-0.0625
	(0.0482)	(0.0609)
Female Employment Rate	-0.0721	-0.0517
	(0.0469)	(0.0587)
Non-Graduates Rate	-0.00509	-0.00395
	(0.00233)	(0.00273)
Region Class	-0.0143	-0.0183
	(0.0139)	(0.0165)
Observations	105	105

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

2.6) Conclusion

This paper aims to assess the effect of an increase in female employment on sexual assault complaints. We analyse a provision contained in the Italian budget law that came into force in January 1st 2018. The law provides for a fund available to social cooperatives for the permanent hiring of women victims

of gender-based violence. Hiring does not require a complaint to the authorities, but a certification issued by an anti-violence centre or shelter. First, let us show that the regulation has been effective. In 2018, there was a significant increase in open-ended contracts for women in social cooperatives. This result is robust, as permanent contracts for women have been steadily decreasing over the same period. To show this we used ISTAT's Quarterly Labour Force Survey. Next, we demonstrate that an increase in female employment corresponds to a reduction in sexual violence in those provinces with a high number of social cooperatives. In fact, analysing two years pre- and post-reform, 2016-2019, we see a significant reduction in the ratio of sexual violence to other crimes, and in the ratio of sexual violence to the average provincial population in the post-reform period. The literature on this effect is quite divided. According to Enswaran and Malhotra (2011), an increase in female participation in the labour market is not sufficient to reduce gender-based violence. Instead, our study aims to demonstrate to policy makers that a strategy of direct intervention on women victims of violence is effective and necessary. Although many studies find a negative correlation of this effect, the study asserts that greater financial autonomy for women who have already experienced violence leads to a reduction in reporting, and thus a reduction in the crimes themselves. Often, women are tied to their partners for economic reasons; this regulation allows them to be independent and autonomous financially and thus allows them to move away from violent contexts. For this reason, the Ministry of Labour and Social Policy have extended the fund until December 31st 2021.

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Chapter 3

Paying less to pay more: the impact of tax cuts on tax evasion.

Abstract

We examine the effect of regional incentives provided for cutting the waste tax on tax evasion. Analysing data from the municipal budgets of two Italian regions, we find that the tax cut, reduced by incentives, leads to a reduction in tax evasion. To support this, we analyse other taxes that are not cut in the same way.

Keywords: Tax Evasion, Monetary Incentives, Waste Tax.

3.1) Introduction

Tax evasion has always been one of the hottest topics for scholars. Every country struggles with tax evaders, and over the years, many policies have been introduced to solve this problem. But which are the most correct and effective policies to use? The purpose of this chapter is to understand whether a policy based on monetary incentives can be successful in reducing tax evasion.

Some of the most widely adopted policies are coercive policies, based on punishments and fines for evaders, and control policies. Some studies argue that the effectiveness of control policies are relevant while policies based on sanctions have no effect on tax compliance (Friedland, 1982). Others argue that sanctions reduce the probability of evasion more than control policies (Park and Hyun, 2003).

Nevertheless, a strategy of pure punishment can be used as a starting point but cannot be the ultimate goal of governments. A strategy of positive rewards for taxpayers must be implemented (Alm, Sanchez and De Juan, 1995). Most of the work on the benefits of incentives on tax compliance is studied in the laboratory. Indeed, they are often experiments or games designed by scientists on a sample of the population. For instance, Brockmann, Genschel, and Seelkopf (2016), set up a controlled laboratory experiment based on incentives not to evade. This study found that only women were more compliant with paying taxes, while for men the reward had the opposite effect, and they evaded much more. Thus, these positive rewards may not be fulfilling their purpose. Another study that follows this line is that of Kastlunger et al (2011). In an experiment with eighty-six people they noted that tax compliance did not improve despite monetary rewards, even though in the treatment group individuals either evaded everything or were completely honest, while in the control group the amount evaded varied more.

When talking about incentives it is always necessary to refer to the crowding out effect, and in this specific context, can incentivising to pay taxes have a crowding out effect on intrinsic motivations? As shown by Dwenger et al (2016), in an experiment conducted in Germany, incentivising tax compliance does not cause any crowding out effect on personal motivations to pay taxes.

Although the literature does not support monetary incentives as a tool to reduce tax evasion, in this paper we observe the effects of a waste tax reduction by an Italian region, Emilia Romagna, because of more environmentalist behaviour by citizens. With the regional law of October 5th 2016, the region financed, with a financing line called LFA, only a few virtuous municipalities producing a quantity of non-recyclable waste lower than the regional average. This financing is entrusted to the municipalities (LFA), which directly cut the waste tax. The tax was cut as of January 1st 2016.

To assess the impact of these incentives, we take the region of Lombardy as a control group, where virtuous municipalities in this region have the same characteristics as virtuous municipalities in Emilia Romagna, but on the contrary do not receive any direct monetary incentive.

The analysed dataset concerns municipal budgets and is provided by The Department of Internal and Territorial Affairs. Within this dataset, we have extrapolated information on the residual waste tax (TARI) still owed to municipalities by insolvent citizens. In addition, we also took data on other taxes (IMU and TASI) in order to perform robustness checks. We hooked territorial context variables taken from the Italian National Institute of Statistics (ISTAT) to build our model based on recent literature.

The first results show a reduction of tax evasion in municipalities where the tax was reduced compared to other municipalities in the post-reform period. By isolating virtuous municipalities in both regions, the treatment loses significance. However, tax evasion is higher in Emilia Romagna than in Lombardy. In fact, we find that in the pre-treatment period, tax evasion is higher and significant in virtuous municipalities in Emilia Romagna than in virtuous municipalities in Lombardy. While, in the post incentives period, this significant difference disappears, and we can consider this as a good result as well. Finally, carrying out the same analysis for the other two taxes taken into consideration, we find no variation between the pre and post incentives period.

The paper is divided as follows. In the next section we discuss the existing literature on tax evasion. In section 3.3 we analyse the existing waste legislation in the two regions. In section 3.4 we describe the

dataset. In section 3.5 we show the results and robustness checks. Finally, in section 3.6 we draw our conclusions.

3.2) Literature Review

Tax evasion is a much discussed and widespread topic in both international and national literature. It is known that taxes are the primary source of revenue for countries to provide for the maintenance and improvement of public services. Cobham (2005) estimates the losses in developing countries to be approximately $385 billion per year, and this naturally has a major impact on the coffers of states. In 2019, the estimated tax evasion in Italy is 183.4 billion euros (Ministry of Economy and Finance, 2021), revenue that could be used to improve various aspects of the country. According to D'Alessio's (2021) study on Italians' opinions, the propensity to evade taxes in Italy is determined by a low level of education and it is developed more in the islands and in the south. Nevertheless, on average, this propensity has also increased in the north, partly due to the economic crisis of 2008.

Many other variables can influence tax evasion. The pioneers of this literature, Allingham and Sandmo (1972) point out that one of the reasons is due to deliberately under-reporting income to avoid taxes. The nature of the service provider also has an impact on evasion. Indeed, Myles (2000) suggests that direct provision by the public sector, as opposed to a private company, encourages a greater propensity to evade, especially by low income individuals. A new part of the literature is highlighting how in the decision to evade there is a moral component of the individual, this component defined as Tax Moral, in recent studies seems to increase when the government is efficient in the provision of services. We can define it as a pact between the government and the population to pay if the government manages resources in the best way (Barone and Mocetti, 2009). Moreover, individuals' perceptions of the community may also influence their choice to evade. Indeed, Welch et al (2005) suggest that not only are those who have evaded in the past more likely to evade in the future, but also that individuals who perceive that the community they belong to is evading will be more likely to evade themselves. Thus, the perception of the immorality of evasion decreases, making threats of

sanctions ineffective. Tax moral is thus a function composed, first, of the exchange between the administration that offers goods and the inhabitants that pay, then of the political procedures of the exchange, and finally of the relationships that are established between the administrators and the citizens. (Feld and Frey, 2007).

What are the possible responses of government authorities to evasion? In order to reduce the problem of tax evasion, many governments use tougher control systems, thus applying coercion to bad behaviour. Snavely (1990) suggests that to reduce tax evasion it is not enough to increase the risks of evasion. Therefore, it is necessary to educate people about the culture of paying taxes, in this way it is possible to obtain long-term effects and it is more effective than coercive policies. Bordignon and Zanardi (1997) suggest some proposals among which we mention a greater responsibility of the participants with the abandonment of total amnesties for evaders, but above all a reduction of tax rates. We emphasise this point because in our analysis we are going to see what a reduction in waste tax, through incentives, has done to tax evasion. An interesting study on this topic is that of Alstadsæter and Jacob (2013) in the private sector, which at first shows a positive sign in the relationship between tax incentives and tax evasion, but changing the estimation method, concludes that entrepreneurs are more interested in complexity rather than an increase in tax benefits. This implies that government must first adjust the control and enforcement strategies; otherwise, it may not get the desired effect and even the opposite effect from the expected one.

Other academics find a correlation between the amount of tax and tax evasion. First, it should be considered that a high tax burden leads to higher tax evasion, as shown by the studies of Cristea, Vodă, Ciocanea, and Luca (2020) and Dinga (2008). Furthermore, in Raita and Mihuț (2021), a study carried out in Romania confirms what we said above, namely that the size of taxes and fees has a direct influence on tax evasion. In fact, companies will be tempted to evade at least a part of these taxes and fees, thus constantly increasing the tax evasion of the whole country. However, Alm et al (1992) suggested that some individuals might pay taxes, and therefore not evade, when they value the public

goods provided by the state that are paid for through their taxes. If there is a tax increase, they may still pay even when the probability of being caught is very low.

Dealing in this paper with a reduction in the amount of waste tax, we take a quick look at the impact of some incentives on the environment. For example, Cossu and Masi (2013), focusing on the Italian waste management situation, point out that the incentive system may not be adequate for an improvement in the health of the environment. More specifically in our case, a recent study shows that a VAT cut must exceed a certain threshold in order to improve environmental policies. Thus, a VAT cut below a certain threshold will not result in any environmental improvement (Lingling and Hongping, 2022). In this paper, we will not focus on the environmental impact of a reduction in waste tax, which we will refer to as (TARI), but we will assess the impact of a reduction in waste tax on tax evasion.

3.3) Region Frames

With the Regional Law of October 5th 2015, the Emilia Romagna region implements Directive 1386/2013/EU of the European Parliament and of the European Council on environmental matters. Through direct measures, the Region aims at reducing the amount of urban waste not sent for recycling. In order to encourage inhabitants and municipalities to do so, it implements some direct funding lines. The above-mentioned law establishes the "Fund for incentives to waste prevention and reduction" which is divided into two main lines. One funding line is based on the provision of incentives to the users of the so-called virtuous municipalities (from now on we will refer to this line as LFA) and other long-term funding lines for the transformation of services, the construction of some waste collection centers and other projects for the reduction of waste production (LFB). As the LFB line is a long-term incentive and we do not have a long period in which to look at the effect, we have focused on the LFA, which, through direct incentives to households, has an immediate impact, so that its effects can be assessed immediately. The management and disbursement of these incentives is the responsibility of ATERSIR, which is a body of the Emilia Romagna region in charge of water and waste

services. Regional Law 16/2015 states that access to LFA funding is granted to municipalities where production per inhabitant of non-recyclable waste is less than 70% of the registered regional average. Incentives are directly aimed at municipalities that have covered part of the costs of users' waste, i.e. by cutting the waste tax defined as "TARI". According to the data released by ATERSIR, the number of virtuous municipalities increased from 2016 to 2018. In 2016 there were 75 virtuous municipalities to benefit from the LFA, in 2017 83 virtuous municipalities and in 2017 and 2018 there were 96 municipalities. As the number of municipalities eligible for incentives increased, the fund per municipality decreased over the years, from a contribution of 3.87 euro/inhabitant to a contribution of 2.40 euro/inhabitant. In general, there has been a progressive reduction in the production of waste not sent for recycling within the whole region. (ATERSIR, 2019). An important figure to highlight is the production in kilograms of non-recycled waste per inhabitant, which is 71 kg on average for the entire region in 2018. Emphasising this data is crucial for the selection of the region to serve as the control group. In fact, through the reports of “Legambiente”, an Italian environmental association, it was possible to compare the virtuous municipalities of the Emilia Romagna region (defined by ATERSIR) with the waste-free municipalities defined by “Legambiente Lombardia”. For the definition of a waste free municipality, a production of non-recyclable waste below 75kg/inhabitant is required. It is easy to see that the municipalities in Emilia Romagna that can access LFA funds must produce less than 71 kg/inhabitant of non-recyclable waste (2018 estimates), while “Legambiente” sets a limit of 75 kg/inhabitant for Lombardy municipalities. There is a minimal difference between the virtuous municipalities of the two regions, which we considered acceptable to proceed with the estimates. We can therefore consider the Emilian municipalities as treated, as they get direct funding, and the Lombardy municipalities as controlled, as they produce approximately the same amount of non-recyclable waste, but they do not get any direct funding from their region.

3.4) Data

The data used for the analysis comes from the Italian Department of Internal and Territorial Affairs, where municipal budgets are available. In Italy, the content, structure and process of budgeting are

regulated by law and they are under the responsibility of the Ministry of Economy and Finance (MEF). For perfect budgeting, local administrators can use the T.U.E.L (Testo Unico Enti Locali). The section of interest to us is in Box 9. Title 1 contains information on municipal taxes, including those of interest to us. The budget shows the estimated amounts to be collected, the amounts actually collected, and the residues still to be collected.

The Department of Internal and Territorial Affairs does not provide this data in any format, so it was necessary to use scraping techniques through Python. In order to do this, it was necessary to find the municipal codes of the cited above department, and then to hook it up to the ISTAT codes in order to cross-reference other context and territorial variables made available by ISTAT itself or by other ministerial bodies.

Table 3.1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Municipality code	1.242e+09	4.531e+08	1030120010	3110590630
Year	2016.527	1.118	2015	2018
Unemployment Rate	6.723	1.323	4.214	12.3
Male Unemployment Rate	5.802	1.335	2.146	11
Female Unemployment Rate	7.936	1.619	4.8	13.8
Employment Rate	66.282	2.016	62.2	72.417
Female Employment Rate	57.774	3.336	51.9	67.265
Male Employment Rate	74.633	1.855	70.02	78.583
Hospitals beds	3406.658	3128.574	556	13732
Surface area	24.828	37.044	1.06	653.812
Population	7962.105	37279.095	32	1395980
Tourism	3748922.3	4515864.2	205486	16181180
Time	.759	.428	0	1
Fiscal pressure	621.769	450.159	0	18413
Prop inves inhab	217.394	536.782	0	24914.83
Cov taxes current expend	.803	.146	0	2.55
Small Town	.62	.486	0	1
Medium Town	.293	.455	0	1
Large Town	.088	.283	0	1
LFA	.059	.236	0	1
Waste tax assessments	857795.74	6527450.4	0	347760808
Waste tax collection	647087.16	4235063.7	0	218219629
Waste tax residuals	145501.54	1452334	0	85342672
IMU assessments	1954020.4	16420780	0	718486741
IMU collection	1729203	14631762	0	654068792
IMU residuals	145591.68	2095744.1	0	173517452
TASI assessments	288659.9	3104043	0	215207466
TASI collection	273491.2	3034839	0	214806767
TASI residuals	14910.18	215330	0	17158104
Tot residuals	800331.3	6849362	0	418688245
Virtuous municipalities	.0973548	.2964605	0	1

Table 3.1 describes the descriptive statistics of the dataset we created. The regions considered for our analysis are the Lombardy region as a control group, and the Emilia Romagna region where we find the municipalities that received funding. The Municipality code is the identification code of the department, which made this data available. This variable is fundamental for the construction of the panel dimension used in the data analysis.

The variable Year identifies the time dimension taken into consideration. The available municipal budget data have a time regime from 2015 to 2018. No further years are provided. By linking both municipal and provincial ISTAT code, we have taken into account some variables, which can well describe the territory. For example, unemployment and employment rates are taken at provincial level. (Municipal level rates are not available). The Unemployment Rate ranges from 4.2% to 12.3%, the Male Unemployment Rate ranges from 2.14% to 11%, the Female Unemployment Rate ranges from 4.8% to 13.8%. The variable Hospitals beds describes the number of beds within each province in the two regions. In the literature, it is taken into account as a variable of territorial efficiency, and ranges from 556 to 13732 beds per province. The land area is available at municipal level, with municipalities ranging from a minimum of 1.06 Km^2 to a maximum of 653.812 Km^2. The resident population is also available at municipal level and ranges from 32 inhabitants to 13959890 inhabitants. The variable Tourism is calculated as the number of days in hotel establishments at provincial level. The variable Time identifies the pre and post treatment period. It has value 0 for the year 2015 and 1 for the following periods until the year 2018. Then we have other 3 municipal context variables obtained from the dataset provided by "AIDA PA" a database that provides territorial variables. We have taken into account the propensity to invest of the municipality per inhabitant, expressed in thousands of euros, ranging from 0 to 24914.83. The coverage index of current expenditure through municipal taxes, ranging from 0 to 2.55, and the tax burden, ranging from 0 to 18413. We created three dummy variables to divide the municipalities into 3 groups, small, medium and large municipalities. Small Town is a variable with value 1 for municipalities up to 4999 inhabitants and 0 otherwise representing 62% of the dataset. Medium Town has value 1 for municipalities up to 19999 inhabitants

and 0 otherwise, representing 29.3% of the dataset. Large town has value 1 for municipalities with more than 20000 inhabitants and 0 otherwise representing only 8.8% of the dataset. LFA is the treatment variable with value 1 for municipalities that had access to Emilia Romagna regional funding and 0 otherwise. Finally, we have our variables of interest. That is, we have the estimated amount of waste tax per municipality, the amount of what they have actually collected, and the amount of the residual part that the inhabitants still have to pay to the municipality, all expressed in thousands of euros. The same reasoning for other municipal tax called IMU, "Imposta Municipale Propria", which is a direct property tax, and TASI municipal tax. Moreover, we find the variable Tot residuals, which identifies the sum of all taxes and fees that the municipality still has to collect from users. It will be fundamental for the construction of the indices. Finally, virtuous municipalities are municipalities in both Lombardy and Emilia with the same characteristics in terms of waste production that cannot be sent for recycling.

3.5) Empirical Results

The analyses in this chapter are very similar to Chapter 2. In fact, in the second part of chapter 2 we used provinces as statistical units. As already mentioned above, our dataset consists of municipalities in two Italian regions. Furthermore, we are going to deal with indices that we have constructed as dependent variables. Since these are ratios, and since they have a panel dimension, we will apply the methods already used, such as the Mundlak (1978) and the Tobit model.

The estimated equation is as follows.

$$Res.TARI\ rate\ per\ Inhab._{it} = \alpha_{it} + \beta_1 LFA_{it} + \beta_2 Time_t + \beta_3 (LFA\ x\ Time) + \theta X_{it} + u_{it} \quad (3.1)$$

Where LFA is a variable that takes the value 1 if municipality i is LFA municipality, $Time$ assumes value 1 if after incentives and 0 otherwise, X_{it} is a vector of control variables. The coefficient of interest is β_3 which measures the effect of the reform.

Outcome I: the TARI evasion index per inhabitant

Table 3.2: Mundlak and Tobit Model; Residual TARI Rate per Inhabitant

VARIABLES	(I) Mundlak Model TARI	(II) Tobit Model TARI
Time	0.0000755***	0.000169***
	(0.0000145)	(0.0000254)
LFA	-0.0000126	0.000132
	(.0000383)	(0.0000872)
Time x LFA	**-.0000787*** **	**-0.000152** **
	(.0000151)	(0.0000764)
Unemployment rate	0.000531	0.00103
	(0.000290)	(0.000339)
Male unemployment rate	-0.000320**	-0.000632***
	(0.000163)	(0.000191)
Female unemployment rate	-0.000250*	-0.000508***
	(0.000134)	(0.000150)
Employment rate	0.000423	0.00124*
	(0.000295)	(0.000675)
Male employment rate	-0.000220	-0.000628*
	(0.000148)	(0.000343)
Female employment rate	-0.000232	-0.000641*
	(0.000148)	(0.000337)
Surface area	-0.000000896***	-0.000000407
	(0.000000298)	(0.0000000368)
Tourism	0.0000000584***	0.0000000150***
	(0.0000000192)	(0.0000000342)
Unemployment rate mean	-0.000725	-0.00672***
	(0.000846)	(0.00188)
Male unemployment rate mean	0.000426	0.00367***
	(0.000463)	(0.00103)
Female unemployment rate mean	0.000319	0.00301***
	(0.000380)	(0.000838)
Employment rate mean	0.00210***	0.00336***
	(0.000623)	(0.00127)
Male employment rate mean	-0.00110***	-0.00190***
	(0.000319)	(0.000659)
Female employment rate mean	-0.00102***	-0.00156**
	(0.000304)	(0.000620)
Toursim mean	-0.000000000279	0.0000000000322
	(0.000000000043)	(0.0000000000102)
Prop. Inves. Inhab.	-0.00000000558	-0.0000000143
	(0.0000000351)	(0.0000000223)
Cov. taxes current expenditure	0.0000961	0.000295**
	(0.000107)	(0.000116)
Fiscal pressure	0.0000000653*	0.0000000762*
	(0.0000000561)	(0.0000000560)
Prop. Invest. Inhab. Mean	0.000000232*	0.000000225***
	(0.000000124)	(0.0000000367)
Cov. Taxes current expenditure mean	-0.000242*	-0.000237*
	(0.000140)	(0.000128)
Fiscal pressure mean	0.000000172*	0.000000189***
	(0.000000133)	(0.0000000635)

Province dummies	Yes	Yes
Observations	7,334	7,334
Number of Municipality_code	1,942	1,942

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

Table 3.2 clearly shows that funding to reduce the TARI tax has led to a reduction in tax evasion expressed by the index we constructed. Recall that this funding was expressed as a "bonus" for municipalities that produced a limited amount of non-recyclable waste. In both column I and column II we find that the interaction variable between time and municipalities LFA is negative and significant at the 1% level. This means that the municipalities, when they received the incentives, and thus cut the waste tax, were able to reduce the share of residues still to be collected. The initial assumptions thus seem to be confirmed by these two first models. The results have more value if we look at the variable Time, which as we said above, has value 1 for the post treatment period, and 0 otherwise. As can be seen, in general in the municipalities of Lombardy and Emilia Romagna there is an increase in the rate of evasion per inhabitant of the TARI tax in the same period in which only some municipalities have been financed. Therefore, the treated municipalities go in the opposite direction to the general trend. Looking at some interesting control variables, we note that the variable identifying provincial tourism is positive and significant to an increase in the evasion rate per inhabitant. This can be justified as in Greco, Cenciarelli and Allegrini (2018), a positive correlation is found between tourism and an increase in waste costs. Thus, an increase in costs leads, as we have seen in our literature section, to an increase in the evasion of that same tax. In addition, an increase in both male and female unemployment leads to a reduction in TARI evasion, probably justified by a reduction in the rate calculated on unemployed persons. The opposite is true for the tax burden index, which has a positive impact on the dependent variable.

In Figure 3.1 and 3.2 we report the average of the Residual TARI Rate per Inhabitant before and after reform for the different groups (LFA equal to 1 and 0 otherwise). Figure 3.2 (post-reform period) shows a statistically significant difference for LFA municipalities as the confidence intervals do not overlap as they do in the pre-reform period (Figure 3.1).

Figure 3.1: Residuals per inhabitant before reform

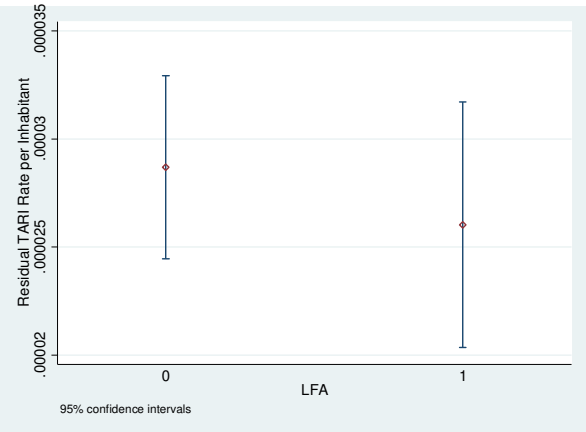
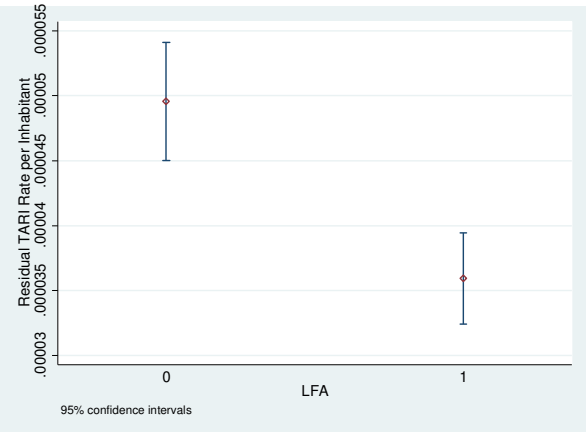


Figure 3.2: Residuals per inhabitant post reform



In table 3.3 the municipalities are divided by population size. The dependent variable is the one in Table 3.2. Small municipalities are municipalities that have a population up to 4999 inhabitants, Medium up to 19999 inhabitants and Large from 20000 and above.

Table 3.3: Differences in municipal population

VARIABLES	(I) Small	(II) Medium	(III) Large
Time	0.000112***	0.00000273	0.00000463
	(0.0000229)	(0.00000186)	(0.00000437)
LFA	-0.000183	-0.00000313	0.0000088
	(0.000145)	(0.000005)	(0.00000178)
Time x LFA	**-0.000106*** **	**0.00000408**	**0.00000134**
	(0.0000403)	**(0.00000335)**	**(0.00000108)**
Unemployment Rate	0.000656	0.0000213	-0.00000242
	(0.000428)	(0.0000277)	(0.00000833)
Male Unemployment Rate	-0.000417*	-0.0000152	0.00000570
	(0.000244)	(0.0000157)	(0.00000465)
Female Unemployment Rate	-0.000314	-.00000113	0.00000126
	(0.000195)	(0.0000123)	(0.00000381)
Employment Rate	0.00126**	0.0000890	-0.00000608
	(0.000509)	(0.0000446)	(0.0000143)
Male Employment Rate	-0.000657	-0.0000579	0.00000252
	(0.000260)	(0.0000225)	(0.00000709)
Female Employment Rate	-0.000662	-0.00000556	0.00000340
	(0.000253)	(0.0000222)	(0.00000717)
Surface area	-0.00000261***	-0.000000130***	-0.00000000890*
	(0.000000875)	(0.0000000373)	(0.00000000475)
Tourism	0.000000000121**	0.00000000000718***	0.00000000000706
	(0.0000000000478)	(0.00000000000163)	(0.00000000000648)
Prop inves inhab	-0.00000000888	-0.00000000971	0.0000000119**
	(0.0000000361)	(0.00000000818)	(0.00000000591)
Cov taxes current expenditure	0.000112	0.0000430**	0.00000129
	(0.000143)	(0.0000198)	(0.00000284)
Fiscal pressure	0.0000000739	0.0000000599**	0.00000000252
	(0.0000000599)	(0.0000000288)	(0.00000000343)
Control variables mean	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes
Observations	4,544	2,146	644
Number of Municipality_code	1,155	543	246

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

As can be seen, the municipalities that drive the effect of the reform are municipalities with a population of less than 5000 inhabitants. In fact, we find no statistically significant difference between medium-sized and large municipalities. The incentives therefore had a very high effectiveness only in small communities.

First check: Control between municipalities with the same characteristics; virtuous municipalities

Again, the Mundlak and Tobit models are used, implementing another difference-in-differences (DD) strategy.

$$Res.TARI\ rate\ per\ Inhab._{it} = \alpha_{it} + \beta_1(LFA\ x\ 2015) + \beta_2(LFA\ x\ 2016 - 2017) + \theta X_{it} + u_{it} \quad (3.2)$$

Where LFA x 2015 is a variable that takes the value 1 if municipality i is LFA municipality LFA before incentives and LFA x 2016-2017 is a variable that takes value 1 if municipality i is a LFA municipality in the period after incentives. The coefficient of interest is β_2 which measures the effect of the reform.

Table 3.4 only shows virtuous municipalities belonging to both regions. We recall that only the municipalities in Emilia Romagna received incentives to cut waste tax, the so-called LFA municipalities.

Table 3.4: Mundlak and Tobit Model; Residual TARI Rate per Inhabitant for virtuous municipalities

	(I)	(II)
	Mundlak Model	Tobit Model
VARIABLES	TARI	TARI
LFA	-0.0000925	-0.000200
	(0.0000712)	(0.000175)
Year16-17 x LFA	**0.0000127**	**0.0000127**
	(0.0000187)	**(0.0000166)**
Year15 x LFA	**0.0000455 ****	**0.0000455****
	(0.0000226)	**(0.0000190)**
Unemployment Rate	-0.0000528	-0.0000528
	(0.000132)	(0.000131)
Male Unemployment Rate	0.0000191	0.0000191
	(0.00000706)	(0.0000727)
Female Unemployment Rate	0.0000207	0.0000207
	(0.0000587)	(0.0000597)
Employment Rate	0.000429**	0.000430
	(0.000186)	(0.000272)
Male Employment Rate	0.000217**	0.000217
	(0.0000933)	(0.000138)
Female Employment Rate	0.000212**	-0.000212
	(0.0000949)	(0.000135)
Surface area	-0.000000280***	-0.000000280**
	(0.0000000803)	(0.000000136)
Tourism	0.000000000164**	0.0000000000164
	(0.00000000000791)	(0.0000000000113)
Prop inves inhab	0.00000000279	0.00000000276
	(0.0000000242)	(0.0000000757)
Cov taxes current expenditure	0.0000839	0.0000838
	(0.0000529)	(0.0000969)
Fiscal pressure	0.000000173*	0.000000173*
	(0.0000000950)	(0.000000127)
Control variables mean	Yes	Yes
Province dummies	Yes	Yes
Year fixed effect	Yes	Yes
Observations	714	714
Number of Municipality_code	183	183

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

As we can see, in the pre-financing period, LFA municipalities were characterised by a higher TARI evasion rate per inhabitant than their counterparts in Lombardy. This result is in line with the data presented annually by ISTAT, which confirms Lombardy as the region with the lowest evasion rate in parallel with the autonomous provinces of Trento and Bolzano. Therefore, from a situation of disparity between the two regions, thanks to the incentives introduced in 2016 the difference between these municipalities is no longer significant. We expected a significance with a negative sign from our variable of interest, but this is still a good result in view of the above. Therefore, the incentives still had the

effect of reducing the gap between virtuous municipalities belonging to two different regions. Also in this robustness analysis, the tourism variable is positive and significant, as is the variable expressing the tax burden.

Second check: Outcome II, IMU and TASI Taxes

The same methods of analysis have been used on other municipal taxes, which are comparable to waste tax. These taxes are called IMU and TASI, and were analysed as dependent variables for an additional robustness check. The two variables were constructed in the same way as the waste tax used before. IMU and TASI, together with TARI, make up the three municipal taxes that every citizen has to pay. IMU is the tax on the real estate component of assets, while TASI is the tax on indivisible municipal services. Comparing these three variables in the same way will strengthen our hypotheses.

We should not find statistically significant differences between the LFA municipalities and the other municipalities, as there are no tax reductions and cuts for these two additional taxes in that period.

Table 3.5: Mundlak and Tobit Model; Residual IMU and TARI Rates per Inhabitant

VARIABLES	(I) IMU	(II) IMU	(III) TASI	(IV) TASI
Time	0.0000073	0.0000225	0.00000138	0.00000119
	(0.0000239)	(0.0000255)	(0.00000414)	(0.00000588)
LFA	0.0000718	0.000318	0.00000138	0.0000250
	(0.0000918)	(0.000122)	(0.0000154)	(0.0000232)
Time x LFA	**-0.000143**	**-0.000113**	**-0.00000978**	**0.0000137**
	(0.0000704)	**(0.0000753)**	**(0.0000122)**	**(0.0000178)**
Unemployment Rate	-0.000340	-0.000394	-0.000150***	-0.000332***
	(0.000324)	(0.000343)	(0.0000563)	(0.0000811)
Male Unemployment Rate	0.000220	0.000258	0.0000817	0.000186
	(0.000183)	(0.000193)	(0.0000317)	(0.0000458)
Female Unemployment Rate	0.000136	0.000159	0.0000654	0.000145
	(0.000144)	(0.000152)	(0.0000250)	(0.000036)
Employment Rate	-0.000527	-0.000630	-0.0000599	-0.000265*
	(0.000633)	(0.000676)	(0.000110)	(0.000155)
Male Employment Rate	0.000278	0.000337	0.0000280	0.000131*
	(0.000322)	(0.000344)	(0.0000558)	(0.0000788)
Female Employment Rate	0.000326	0.000393	0.0000361	0.000142*
	(0.000315)	(0.000337)	(0.0000547)	(0.0000772)
Surface area	-0.000002***	-0.000000287	-0.000000136*	0.0000000381
	(0.00000437)	(0.000000631)	(0.0000000721)	(0.000000109)
Tourism	-0.0000000000145	-0.000000000026	-0.00000000000785	-0.0000000000239
	(0.000000000033)	(0.0000000000346)	(0.00000000000572)	(0.0000000000798)
Prop inves inhab	0.0000000292	0.0000000442	-0.0000000144***	-0.0000000208***
	(0.000000022)	(0.0000000231)	(0.00000000382)	(0.00000000578)
Cov taxes current expenditure	-0.000143	-0.0000957	-0.0000353*	-0.0000514*
	(0.000110)	(0.000121)	(0.0000191)	(0.0000284)
Fiscal pressure	0.0000000272*	0.0000000816*	0.00000000959*	0.0000000209*
	(0.0000000558)	(0.0000000566)	(0.00000000969)	(0.0000000146)
Control variables mean	Yes	Yes	Yes	Yes
Province dummies	Yes	Yes	Yes	Yes
Observations	7,334	7,334	7,334	7,334
Number of Municipality_code	1,942	1,942	1,942	1,942

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

Therefore, as Table 3.5 shows, the variable of our interest, i.e. the intersection between the period of the reform and the LFA municipalities, is not statistically significant for either IMU or TASI. This is a further confirmation of our initial hypotheses, since only the tax that was deducted from citizens' bills allowed a reduction in tax evasion. In fact, there is no effect whatsoever on the other municipal taxes that were not considered in this financial and environmental measure. Moreover, the variable tourism does not turn out to be significant, in fact, as per literature it only has an impact on waste tax, while the tax burden continues to affect the evasion of all taxes.

Finally, we use the same method as in Table 3.4. We then check the IMU and TASI evasion for those municipalities called virtuous, which have the same characteristics.

Table 3.6: Mundlak Model; Residual IMU and TASI Rates per Inhabitant for virtuous municipalities

VARIABLES	(I) IMU	(II) TASI
LFA	0.00002	-0.00000947
	(0.000135)	(0.0000158)
Year16-17 x LFA	**0.0000558****	**0.0000153*****
	(0.0000246)	**(0.00000364)**
Year2015 x LFA	**0.0000814*****	**0.000006***
	(0.0000282)	**(0.0000419)**
Unemployment Rate	-0.0000915	-0.0000577*
	(0.000194)	(0.0000299)
Male Unemployment Rate	0.0000512	0.0000336
	(0.000108)	(0.0000166)
Female Unemployment Rate	0.0000369	0.000027
	(0.0000884)	(0.0000136)
Employment Rate	0.0000712	-0.000033
	(0.000403)	(0.0000621)
Male Employment Rate	-0.0000290	0.0000163
	(0.000204)	(0.0000314)
Female Employment Rate	-0.0000267	0.0000174
	(0.000201)	(0.0000309)
Surface area	-0.000000135	-0.0000000116
	(0.000000202)	(0.00000002)
Tourism	-0.00000000000827	0.00000000000241
	(0.0000000000167)	(0.00000000000256)
Prop inves inhab	0.0000000497	0.000000000849
	(0.000000112)	(0.0000000173)
Cov. Taxes current expenditure	-0.00000255	-0.00000549
	(0.000143)	(0.000022)
Fiscal pressure	0.0000000143*	0.00000000864*
	(0.000000188)	(0.0000000288)
Control variables mean	Yes	Yes
Province dummies	Yes	Yes
Year fixed effect	Yes	Yes
Observations	714	714
Number of Municipality_code	183	183

(1)*** p<0.01, ** p<0.05, * p<0.1; (2) Robust standard errors in parentheses

In table 3.6 we note an increase in tax evasion of both taxes of LFA municipalities compared to Lombardy municipalities in all time periods. This confirms a certain propensity not to evade in the Lombardy region as already mentioned above. Thus, once again we underline how the incentives to cut the waste tax have been very effective in reducing the evasion of that tax compared to the evasion of other taxes.

3.6) Conclusion

This paper aims to assess whether a reduction in the rate of a tax can lead to a reduction in tax evasion. In order to do so, we analysed the effects of incentives provided by the Italian region of Emilia Romagna. With the regional law of October 5th 2016, the region finances some virtuous municipalities that keep the average production per inhabitant of non-recyclable waste below a predetermined threshold. These incentives called LFA aim to reduce the waste tax of these virtuous municipalities. The tax reductions start on January 1st 2016. In order to assess the effects of the legislation, we have considered another Italian region as a control group, Lombardy, where the virtuous municipalities have similar characteristics to the Emilian municipalities, but unlike the latter, they do not get any incentives.

In order to do this, we used data from The Department of Internal and Territorial Affairs, which provides the budgets of every Italian municipality. Moreover, in order to build a model as complete as possible, we took some control variables from ISTAT. The results found support that the cut on the rubbish tax produced a decrease in evasion on the rubbish tax compared to the other municipalities in the two regions and only in the post-reform period. A concept that could be expressed with the phrase "Pay less, Pay more". If we analyse the events we can suggest that the attractive incentive not only diverted individuals' behaviour towards better environmental performance, but also that the same individuals evaded less of the same tax that had been cut. The incentives therefore had an indirect effect on the behaviour of individuals, who were happier to pay. The results are robust as the same analyses were performed on two other taxes similar to the waste tax, i.e. property tax and municipal services tax. For these two taxes, our analyses suggest a higher evasion for LFA municipalities, due to the higher evasion found in Emilia Romagna than in Lombardy. Nevertheless, in the post-reform period, these two taxes do not change in any way compared to the previous period. We can therefore conclude that providing monetary incentives for positive behaviour (in this case from an environmental point of view) can indirectly induce inhabitants to engage in other positive behaviour such as paying taxes.

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Concluding remarks

We estimated the effect of monetary and non-monetary incentives in 3 different fields. Our three papers lead to a unique result. Both incentive systems are effective and can lead to goals that are not set ex ante. Our results are in line with previous results found in the literature.

Indeed, in the first chapter we find that the behavioural economics theory called Student Identity Priming can stimulate students' effort and performance, on the contrary it is not effective with former students. Based on an experiment carried out in two different Universities, our results show that stimulating the cognitive system of individuals through images and videos recalling their own identity causes an increase in academic performance, as calculated through the administration of an IQ test. We then show the effectiveness of non-monetary incentive systems.

In the second chapter, our results show that incentives to hire women in specific companies have an indirect effect on sexual violence. We first demonstrate the effectiveness of monetary incentives through a policy evaluation. Indeed, we find an increase in women's hiring in cooperative firms in the post-reform period. Next, we show that an increase in women's economic autonomy reduces sexual violence as we find a statistically significant reduction in violence in those provinces where financial support is allocated in the post-reform period.

Finally, in the third chapter, we show how a waste tax incentive due to improved environmental behaviour leads to a reduction in waste tax evasion. Our estimates find a positive relationship between incentives and tax compliance. In fact, we find that in the post-reform period, municipalities that received incentives experienced a reduction in the tax evasion rate per inhabitant compared to municipalities that did not receive the funds.

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