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Essays in Labor Economics

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Contents

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Preface

This dissertation consists of three essays in the field of labor economics. Each of the papers makes use of microeconometric techniques to answer different research questions. In the first we present a new dataset on tax wedge, the second chapter is an analysis of the presence of familism in the Italian Academia and its correlation with academic performance, the third chapter studies the importance of physical appearance on the labor market focusing on obesity.

The first chapter : *Tax Wedge and the Effect on Labor Market Outcomes: Evidence from a Novel Dataset*, presents an unique dataset on labor tax wedges for developing, low income and developed countries. The tax wedge is defined as the difference between the firm labor costs and the worker's net income this difference corresponds to income taxes and payroll taxes, we calculate the tax wedge as a proportion of labor cost. The firm labor cost that we consider is the sum between the gross wage w and t_f, the level of contribution paid by the firm, the worker's take-home pay is defined as the difference between the gross wage w and the contribution paid by the employee, t_e. If there were no distortion in the labor market $t_e + t_f$, should be equal to zero. The measure of tax wedge that we use is defined by the following formula: $TW = (t_e + t_f)/(w + t_f)$ where t_e is the tax rate for the contribution paid by the worker, t_f is the tax rate for the contribution paid by the employer; w is the gross wage, normalized to 1 in this setting, thus the denominator is the cost of labor. Using this formula we constructed labor tax wedges for a panel of 105 countries and 24 years (taking information mainly from the Worldwide Summaries for Individual and Corporate taxes by Price Waterhouse Coopers) in order to understand the structure of the payroll taxes and to capture the evolution of the tax wedges over time and across countries. Looking at the data we show that the three levels of tax wedges are shirking over time and that there is a kind of harmonization across countries, countries whit an high tax wedge tend to reduce

is, this is due to the decreasing of the highest levels of personal income taxes. The second part of the project aims at analyzing the effects of the tax wedge on the labor market outcomes. The empirical analysis shows that taxes on wages are positively correlated with the unemployment rate, controlling for other labor market institutions. Finally we explore the relevance and the effect of progressiveness on labor outcomes, we find that in countries where unions are stronger tax progressiveness has a negative impact on unemployment.

The second chapter is titled *Academic Dynasties. Familism and Productivity in the Italian Academia* and some sections of the chapter will be part of the paper *Academic Dynasties* joint with Ruben Durante and Roberto Perotti. The essay explores the relevance of family connections and their potential impact on scientific production in the context of the Italian university system. This chapter aims to provide systematic evidence of the relevance of family connections within Italian academia. To this end, we use an original data set on professors' last names available from the Italian Ministry of University and Research (MIUR) that cover all professors employed in both private and public universities and include information on professors' first and last name, university and department of affiliation, discipline, and position. We construct an academic homonymity index (AHI) by comparing the relative frequency of each last name in each academic unit (department, faculty, university) with its relative frequency in the population of the province and the region in which the university is located. Data on the distribution of last names in the Italian population comes from the Italian fiscal census. Our index is meant to provide an intuitive and coherent measure of how common a certain last name is within a specific academic unit relative to the overall underlying population. Intuitively, that a certain last name is significantly more common within an academic unit than within the population from which professors are drawn from may suggest, though not necessarily, that the selection process is based on criteria other than academic merit, *in primis*, on family ties.

Our measure allows us to investigate differences across universities and across disciplines in terms of the relevance of family connections. When we rank Italian universities based on their departments'average score in our homonymity index, we find that the universities of Messina, Bari, and Catania occupy the top three positions, a result consistent with the extensive anecdotal evidence. With regard to differences across disciplines, the area of medicine is characterized by the highest score in our homonymity index, followed by veterinary and agriculture. Interestingly, we also find a negative correlation between our index of homonymity and standard measures of interpersonal trust in the area where the university is located. In light of previous findings (Banfield, 1958, Alesina and Giuliano, 2007) we interpret this result as evidence that, even in the context of the university system,in areas characterized by low levels of generalized trust, family ties tendto play a more important role. To better understand the relation between social trust and familism we exploit the 1998 reform that decentralized the recruitment process, we test the hypothesis that the impact of the reform is "good" in places characterized by an high level of civic mindedness "bad" in place where the social trust is low and people rely more on their family. The results confirm our hypothesis, we find that in place with high civic mindedness (measured with the level on blood donation per person as in the previous literature) the decentralization brought a decrease of familism in academia.

The third chapter is titled *Does physical appearance matter? Overweight and labor market discrimination* and some sections of this chapter will be part of a paper with the same title joint with Michela Braga. The chapter analyzes wether being obese or overweight might have a negative impact on employment status in Italy. Several studies documents the relationship between physical appearance and labor market outcomes in developed countries. They highlight that physical appearance do matter in modern labor markets. Such results can be rationalized in different ways. First, obesity or overweight have been proved to increase the likelihood of se-

vere diseases both physical and psychological (cancer, diabetes, asthma, hypertension, depression) and, because of these problems, people can be less productive. If it is the case, their return to the labor market would be lower both in terms of wages and probability to be employed. Second, obese people can be stigmatized and discriminated by employees simply for their aspects because they do not respond to the widespread stereotype of beauty. Third, being overweight could be an individual observable characteristic correlated with some individual unobservable, such as worker's personality traits and ability. Employees can interpret physical aspect as a signal for individual lower productivity, lower self-esteem and no self-control and in imperfect labor markets, where the employer cannot control workers' ability due to asymmetric information, it translates in worse labor outcomes. In this chapter we analyze whether being obese or overweight might have a negative impact on employment status in Italy. Empirical findings, using data from the National Institute of Statistics, show that obesity decreases the probability of being employed for women while the effect is positive for men but not strongly significant. However, obesity or overweight is not randomly across individuals, since some unobservable individual characteristics can affect both the probability to be obese or overweight and the probability to be employed. Arguably factors like self-esteem or self-control are correlated both with body weight and employment status and therefore we have an endogeneity problem. We deal with the potential endogeneity using as an exogenous source of variation for BMI the exposure in the years before the survey to TV shows where the role of the appearance and physical beauty is crucial. The key identification assumption is the following: having been exposed to a specific image of body type influence individual weight without having a direct effect on the probability to be employed. The idea is that the importance of the physical appearance on television could induce people to change their appearance and mainly their weight but it is very unlikely that it influences the individual employment status; in this setting having

not contemporary data for employment status and TV shares guarantee the orthogonality assumption to hold. Our main contribution to the literature is the use of a new data set containing information on the BMI for exploring its impact on the probability of being employed in Italy. Furthermore we use a new instrument to exploit the influence in TV on BMI.

CHAPTER 1: Tax Wedge and the Effect on Labor Market Outcomes: Evidence from a Novel Dataset

Giovanna Labartino*

Abstract

This essay presents a unique data set on labor tax wedges for developing and developed countries. Using data on tax rates (Worldwide Summaries for Individual and Corporate taxes by Price Waterhouse Coopers) we construct a panel data set containing information on payroll and personal income taxes for 105 countries and 24 years. As tax wedges vary with income, we then construct three different tax wedges measures according to three levels of incomes: the lowest, the average and the highest. The most remarkable feature of the data is a harmonization process across countries: high tax wedges are shrinking over time and more generally tax wages are converging across different countries. The chapter aims at analyzing the effects of the tax wedge on the labor market outcomes. The empirical analysis shows that taxes on wages are positively correlated with the unemployment rate, controlling for other labor market institutions. Finally we explore the relevance and the effect of progressiveness on labor outcomes, we find that in countries where unions are stronger tax progressiveness has a negative impact on unemployment.

*I am grateful to the IMF for providing access to their unpublished data set that was constructed as part of a larger project on structural reforms in the IMF's research department. Property right of data contained in the chapter belong to the International Monetary Fund.

1 Introduction

Understanding the role of labor market institutions on unemployment and employment rates and labor market participation has been an important issue for both academic scholars and policy makers. The structure of a labor market is traditionally analyzed by looking at legal aspects like employment protection or restrictions against firing, at the level of insurance provided by unemployment benefits and at the importance of active policies for creating labor.

Taxes also play a key role in the structure of the labor markets having an impact both on the supply and on demand of labor. Revenues from payroll taxes are typically used to finance unemployment insurance, social security, as well as other social programs. The presence of taxation puts a wedge between the labor cost incurred by the firm and the gross wage received by the workers.

This chapter presents a new data set on labor tax wedges for developing, low income and developed countries. We constructed labor tax wedges for a panel of 105 countries and 24 years (taking information mainly from the Worldwide Summaries for Individual and Corporate taxes by Price Waterhouse Coopers) in order to understand the structure of the payroll taxes and to capture the evolution of the tax wedges over time and across countries. Looking at the data we show that the three levels of tax wedges are shirking over time and that there is a kind of harmonization across countries, countries whit an high tax wedge tend to reduce is, this is due to the decreasing of the highest levels of personal income taxes.

In empirical cross country studies, total labor taxation is typically associated with lower aggregate performance, and international

policy makers often call for reduction in total tax wedge. Inevitably, for a given government spending, a reduction in payroll taxation and the tax wedge requires an increase in general taxation. Conversely, a unilateral reduction in payroll taxation requires a proportional reduction in government spending. When thinking about reduction in total tax wedge, it is very important to distinguish the two channels. A revenue neutral shift from labor to general taxation often involves an increase in the progressiveness of taxation. In presence of labor market imperfections (search frictions and unions) this shift may reduce the negative effects of taxation on employment. In Pissarides' theoretical framework is not only taxation which plays a key role, it is also the structure on taxation that matters; when wages are determined by bargaining between firms and workers, if taxes become more progressive there is a reduction in unemployment. The aim of the second part of the project is then to investigate the impact of tax wedges on unemployment considering different levels of union density and tax progressiveness (following Pissarides (1998)). We find a positive relationship between tax wedge and unemployment but, in line with Pissarides (1998) it seems that in countries where unions are stronger tax progressiveness has a negative impact on unemployment. The chapter is structured as follows: Section 2 briefly summarizes the previous literature on the topic. Section 3 describe what is the tax wedge and the sources that we used to build the data set; Section 4 presents an overview of the data; Section 5 describes the empirical strategy and the results. Section 6 concludes and presents ideas for further research.

2 Literature review

Previous studies have tried to construct indices or measurers to investigate the structure of the labor market across different countries.

Shleifer et al. (2004) examine government regulation of labor markets in 85 countries in order to understand the differences in the regulation of labor among countries, they collect data looking at employment laws and industrial (collective) relations laws, social security laws. The indices are available for only one year, 1997; their main data sources are the constitutions and laws of each country in the sample. They examine the relationship between the protection of workers and legal origin, and, holding income constant, they find that employment protection laws are generally weaker in richer countries and that social security increases significantly with income.

Heckman and Pages (2000) collect and examine an extensive dataset of job security regulation for Latin American and Caribbean countries. They covered twenty years between 1980 and 1999 collecting data from the ministers of labor: the indicators are based on advance notice for firing, compensation if worker quits, payment in case of unjustified dismissal etc, so they focus on rigidity of labor market in the form of employment protection. They find a substantial impact on the level and distribution of employment in Latin America, the negative impact is more significant for young people and groups marginal to the work force, they do not have data on taxes.

Nicoletti, Scarpetta and Boylaud (1999) study the shape of the

labor and product markets regulation over time, but only for OECD countries. Their paper presents the methodology to generate summary indicators to measure the rigidity of product market regulation and employment protection legislation. Nicoletti and Scarpetta (2005) study the degree of complementarity between the labor and the product markets and the role of institutions in both sectors, they find restrictive that regulations have a higher impact on the employment rates in countries where there were no reforms in labor markets. Finally, their paper with Fiori and Schiantarelli (2007) shows that product and market deregulation are both substitutes and complements: liberalizing the product market has a positive direct effect on labor outcomes and also an indirect effect since it induces changes in labor market policies and institutions.

If we focus on the taxation literature, several works have analyzed the impact of the taxation system on the labor market outcomes. Nickell (2004) defines the tax wedge as the sum of three different components: payroll taxes, income taxes and consumption taxes and shows with a simple model, following Pissarides (1998 and 2001), that the total tax wedge could have an negative impact on work. Focusing on OECD countries, he looks at the impact of taxes on labor cost per employee and finally at the effect of taxes on aggregate labor inputs. He finds that tax rates differential explains only a minority of labor market differentials, and that taxation does not have a big impact on the labor market performances.

Daveri and Tabellini (2000) obtain different results in their empirical investigation based on a panel of 14 OECD countries between 1965 and 1995. They find that an increase in the tax wedge has a

deep impact on the real labor cost for countries in Continental Europe, they also find a big impact on unemployment. Their estimates suggest that the distorting effects of labor taxes are bigger than those of capital and consumption taxes so they claim a reduction of the labor taxation in order to reduce unemployment.

Bassanini and Duval (2006) study the role of policies and institutions in the labor market of the OECD countries, they find also a significant impact of taxes on employment: high unemployment benefits and high tax wedges are found to be associate with lower employment rate for all groups of workers.

The contribution of this chapter to the literature is to build a new data set on tax wedges. The aim is to have a panel data in which we associate for each country variation of the tax wedges over 24 years (1981-2004).

The Fraser Institute also collected data on regulation of labor (The Economic Freedom of the World Data set) in 66 developing and developed countries: they have data for 1970 to 2000, five years points, elaborated from surveys of international business and the institute tried to measure the rigidity of the market related to the hiring and firing practices, the level of unemployment insurance and the level of tax wedges.

Doing Business (World Bank Group) has a sample of 86 countries, including developing countries, and for each of them records the difficulty of hiring and firing, rigidity of hours, the hiring and firing costs and non wage labor costs, the data have been collected since 2000.

We have an unique data set on tax wedges with a panel structure

and it covers a longer period respect to the previous ones. Since we collect data on marginal income taxes we also able to identify and to study the progressiveness of the tax system for each country across time, we can then explore the effect of structure taxation on unemployment.

3 What is the Tax wedge actually?

From the literature we learned that labor demand is mainly determined by total labor cost while labor supply depends mainly on after tax wage income. The tax wedge is defined as the difference between the firm labor costs and the worker's net income[1], this difference corresponds to income taxes and payroll taxes. Blanchard (2006) refers to the tax wedge as the difference between the take-home pay for workers and the cost of labor for firms, divided by the wage.

Nickell (2004) also considers consumption taxes as component of the tax wedge; we do not consider the consumption taxes and we calculate the tax wedge as a proportion of labor cost.

The firm labor cost that we consider is the sum between the gross wage w and t_f, the level of contribution paid by the firm, the worker's take-home pay is defined as the difference between the gross wage w and the contribution paid by the employee, t_e. If there were no distortion in the labor market $t_e + t_f$, should be equal to zero. The measure of tax wedge that we use is defined by the following

[1] OECD (2005) "Taxing Wages"

formula:

$$TW = (t_e + t_f)/(w + t_f)$$

Where t_e is the tax rate for the contribution paid by the worker, t_f is the tax rate for the contribution paid by the employer; w is the gross wage, normalized to 1 in this setting.

Thus the denominator is the cost of labor. Another version can be constructed considering just the gross wage and not the cost of labor, as in the following formula:

$$TW_g = (t_e + t_f)$$

The contribution of the worker includes personal income tax, contribution for the pension system and others taxes depending on the country. The contribution of the employer includes insurance, unemployment contribution and other taxes depending on the country.

As the tax wedge varies with income levels, this chapter shows the construction of three different levels of tax wedges:

- the first one is calculated for the lowest level of income, as it is constructed on base of the lowest level of personal income tax rate;

- the second one refers to the average worker and the personal income tax rate: in this case it refers to an average wage. The data on average wages are drawn from the IMF database (IFS) and from ILO. We consider average monthly or yearly wages in the manufacturing sector;

- the last one refers to the top marginal personal income tax.

To construct the tax wedge the Worldwide Summaries for Individual and Corporate taxes from Price Waterhouse Coopers has been used. The Worldwide Summaries are available from mid 1980s so we can see the evolution of the tax wedges for the different countries. We also used data from the web site "Social security Thought the world" and data from ILO, average wages in manufacturing. Table 1 in the appendix shows the countries for which the three measures of tax wedge have been calculated. For each country we show the number of observations for the three indices and the average value for each level. We can easily see that for many countries we do not have information on taxes for all the years in the data set but we are still able to have a large coverage of countries and years. In addition we can give a picture of the progressiveness and the tax structure in all the countries by comparing the lowest and highest level of marginal tax rates.

4 Looking at the data: How did the tax wedge move over time?

Here we present a preliminary analysis on the evolution of the average tax wedges over time. The tax wedge changes over time according to the evolution of its components:

Fig.1 in the appendix shows the evolution of the average tax wedges across time for all the countries in the data set (we do have data also for 2005 and 2006 but we do not consider those two years since we still have a lot of missing data for those years), it is clear

that the tax wedge decreased across time. This is particularly true for the highest level of taxes, those related to the highest personal income tax rate. It also seems that there is a convergence between the three measure points to a decrease in the progressiveness of labor taxes. This could be explained with a reduction in the top marginal income tax rate across time. The average and the low income tax rate did not change a lot as shown in Fig.2: the highest income tax rate is declining, on average, over time. Here we can see a tendency of the governments to reduce the number of brackets in response to the need of increasing the efficiency of the systems and ease the control[2].

The next three graphs, Fig.3, Fig.4 and Fig.5, show the evolution of tax wedges for different regions: Here we can see the evolution for four different regions in the dataset: OECD, Latin American Countries and Asia; and also if we divide the sample, these graphs underline that the highest tax wedge is decreasing over time across regions. We can also clearly see that tax wedges are higher in the OECD countries, but in these countries there is also the highest tax wedge decreased over time.

The second series of graphs show cross country differences in tax wedge and their changes between 1981 and 2004. The first graph (Fig.6) shows that there are not so much difference for the first measure of tax wedge between 1981 and 2004, it seems that the lowest level of tax wedge is widened across countries. The second graph (Fig.7) shows instead that there were some changes in the distribution across countries and that there is a kind of harmonization across countries, the minimum and the maximum of the distribution

[2]Burgess and Stern (1993)

became closer. The 75th percentile became closer to the 50th which means that the distortion due to the tax wedge is shrinking. Fig.8 again shows that differences across countries are narrowing also for the third measure of tax wedge.There is a kind of harmonization across countries, for countries with a high tax wedge, the distortion is shrinking and it is converging over time across countries.

5 Empirical analysis, methodology and results

We had a look at the data, the next step is to investigate how labor income taxation affects labor market outcomes like unemployment, labor force participation and wages in these countries. In particular, we will look at the effect on unemployment rate. Looking at the data it seems that there is a positive relationship between tax wedge and unemployment rate as shown in Fig. 9
Following the empirical literature we are going to estimate the following model:

$$Y_{it} = TW_{it}\theta + X_{it}\beta + \gamma_i + \tau + \tau\alpha_j + u_{it}$$

where the dependent Y_{it} variable denotes the unemployment rate in the country i at time t, TW is tax wedge construct as described before and displayed in Table1 (we use the three different levels), γ_i country fixed effect, τ is a linear trend that is some specification is interacted with geographical country grouping α_j (Oecd, Asia, Africa and Latin American and Caribbean). Finally X_{it} is a set of time-varying, observable, country specific characteristics that may

affect Y_{it}. These controls include other labor market institutions as:

- Minimum/Mean wage which is the ratio between minimum and mean wage: the source is a new data set built by fondazione Rodolfo Debenedetti (fRDB) in co-operation with IMF which contains information on the levels of minimum, average and median wages in national currencies for 91 countries for the period 1980-2005.

-Severance payments: for each country is the maximum in months of severance payments, the source and the data coverage is the same of the minimum wage.

- Unemployment benefit: gross replacement rate after one year, the source is still the data from fDRB.

Then we use other country variables as:

- Vat is the values of value added taxes, is it calculate in percentage, the source is Worldwide Summaries for Individual and Corporate taxes by Price Waterhouse Coopers

- Gdp per capita, source is World Bank.

The source for the unemployment rate is IMF, World economic outlook. Table 2 shows summarize statistics.

5.1 Regression results

Table 3, Table 4 and Table 5 reports fixed effect estimation of the previous equation, the first table show the results for the lowest level of tax wedge, the second and the third the ones for the average and the highest level respectively.

Our estimate suggest that tax wedge are positively correlate with unemployment rate, the magnitude of the coefficient is almost the

same for the first two level of the wedges, and they are both statistically significant also when we control for the linear trend and region specific trends, although they become smaller and less significant. If we consider the lowest level of tax wedge and the last specification (column 3 in Table 3) we can say that a standard deviation change in tax wedge, which corresponds in our case to 14.8 percent, increases unemployment rate by 0.47 percentage points. For the average level of tax wedge, a standard deviation change in the tax rates (14.4 percent in this case) increases the unemployment rate by 0.38 percentage points. In Table 5 instead we can see that the highest level of tax wedge is not correlate with unemployment rate, the sign is still positive but the coefficients are not statistically different from zero. We can also note that unemployment benefits have a strongly positive effect on unemployment rate, the effect of severance payments is positive but it does disappear when we control for the trends, the presence of minimum wage does not seem to have any effect.

5.2 The effect of progressiveness

We now want to investigate if the structure of taxation rather than taxation itself affects the labor market outcomes, we then add also tax progressiveness in the specification that we saw before and in particular we are also taking into account the role of unions and the interaction between the presence of unions and structure of the tax system. We estimate the same model as before adding progressiveness and unions density. Tax progressiveness is calculate as the difference between the top and the bottom marginal personal tax

rate and give us an idea of the degree of redistribution pursued by the Government, the sources of the data are those used for the tax wedge construction. In order to proxy the presence and the strength of the unions for each country we use the union density calculate as the union's membership in no agriculture sector (as a proportion of all those employees potentially eligible to be members), the source is ILO, we take the average of the density over years for each country, so our measure does not change over time.

The results are shown in the last three tables, in particular looking at Table 7 we can see that progressiveness itself has no effect on unemployment but when interacted with union density it has a negative effect on unemployment, the results is still there also when we control for trend specific region; the effects of the tax wedge and the other institutions is not different from the ones described in the previous sessions.

6 Conclusion

In this chapter we present a new data set on tax wedge, we construct three different measures of tax wedges according to the level of personal income tax rate that we take into account, the lowest, the average and the highest level. We present a new panel of 105 countries for 24 years, we show that the three level of tax wedges are shirking over time and that there is a kind of harmonization across countries, countries whit an high tax wedge tend to reduce is, this is due to the decreasing of the highest levels of personal income taxes.

We then look at the effect of taxes on unemployment, our pre-

liminary results show that taxes have a negative impact on unemployment, although our results cannot be interpret as causation but more like correlations since we do not test a particular theoretical model.

Finally, looking at progressiveness, it seems that in presence of strong unions tax progressiveness has a positive impact on un employment.

Looking at the data it seems clear that the highest tax rates are decreasing over time, more or less in all countries. In order to extend this project we are going to focus on choices over redistribution and progressiveness. It seems that progressiveness is decreasing in many countries, and we would like to investigate if having a center-left government rather than a right-wing one could change the structure of taxation.

Iversen and Soskice (2006) developed a model of redistribution that explains why some democratic governments are more prone to redistribute than others. They underline the fact that electoral system plays a key role in this setting, their model implies that in presence of proportional electoral system is more likely that center-left dominates and that the redistribution is higher than in a majoritarian system (where center-right parties are more likely to win the elections). They test their model on panel data for redistribution, government partisanship and electoral systems in advance democracies.

Following their approach we will test if having a center-left government rather than a center-right one will influence the progressiveness of taxation, controlling for the electoral systems and controls

for the economic situation in the countries. We will measure the progressiveness like the ratio of the top level of taxation and the lowest one (personal income taxes and taxes on wages) and we will see how the ratio has changed over time in the high income countries and what role partisanship has for progressiveness. The will use the data on personal income taxes and tax wedge that we described above and data coming from DPI World Bank for political parties.

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Tables and Figures

Table 1: Country in the dataset

Country	*Obs*	*TW(lowest)*	*TW(mean)*	*TW(highest)*
Angola	10	10.81	12.71	21.26
Antigua and Barbuda	7	35.65	35.69	59.54
Argentina	24	39.70	40.91	63.79
Australia	23	5.66	36.98	54.36
Austria	24	43.64	55.52	56.71
Azerbaijan	2	32.61	42.77	50.58
Bangladesh	24	1.66	1.66	38.43
Barbados	24	34.45	36.40	50.14
Belgium	24	64.29	67.72	80.04
Belize	1	9	16.03	54.41
Bermuda	12	9.78	9.78	9.78
Bolivia	19	33.61	34.11	37.12
Botswana	24	5.31	9.75	39.37
Brazil	24	33.34	33.34	44.17
Canada	20	22.43	31.52	32.63
Chile	24	26.87	26.87	48.79
Colombia	24	50.13	50.13	53.53
Congo, Dem. Rep.	17	29.70	38.06	66.48
Costa Rica	24	24.48	29.68	47.27
Croatia	8	48.57	59.01	64.23
Cyprus	24	12.42	45.99	48.49
Cote d'Ivoire	20	19.32	20.08	57.47
Denmark	24	48.51	58.22	68.32
Dominica	24	15.28	24.038	51.87
Dominican Republic	24	19.76	21.50	48.30
Ecuador	5	27.66	36.87	59.13
Egypt	19	15.04	32.85	53
Estonia	10	25.51	45.05	45.05

Table 1: Country in the dataset cont.

Country	*Obs*	*TW(lowest)*	*TW(mean)*	*TW(highest)*
Fiji	23	25.61	37.12	54.22
Finland	23	23.15	48.43	58.70
France	21	43.64	48.72	74.86
Gabon	11	23.55	31.81	53.63
Ghana	24	19.85	39.62	54.81
Greece	19	40.78	46.19	54.39
Guatemala	24	25.94	26.84	45.26
Hong Kong	24	4.52	18.23	22.14
Hungary	15	51.73	57.95	67.76
Iceland	19	31.94	37.46	42.16
India	17	34.66	42.75	61.67
Indonesia	12	17.73	16.97	37.61
Iran	17	36.42	54.21	60.70
Ireland	24	35.85	38.85	52.37
Israel	13	20.65	28.01	57.60
Italy	24	46.99	52.59	60.16
Jamaica	23	35.03	35.51	42.19
Japan	21	30.02	37.21	57.86
Kazakhistan	4	32.53	44.44	52.38
Kenya	23	19.04	52.69	52.69
Korea	23	14.20	22.44	53.67
Kyrgyz Republic	2	24.78	33.19	52.10

Table 1: Country in the dataset cont.

Country	*Obs*	*TW(lowest)*	*TW(mean)*	*TW(highest)*
Latvia	10	47.78	47.78	48.51
Lebanon	22	25.21	33.06	42.33
Liberia	11	17.77	26.37	69.45
Libya	12	11.89	27.61	46.11
Lithuania	9	49.69	49.69	49.69
Luxembourg	24	52.86	52.86	65.28
Macedonia	12	39.64	41.85	46.84
Malawi	20	8.2	22.85	42.4
Malaysia	24	24.05	28.92	54.21
Malta	24	26.67	31.73	46.25
Mauritius	19	16.67	29.82	36.99
Mexico	20	22.21	28.60	46.84
Mozambique	6	16.34	22.75	29.80
Namibia	9	25.44	36	36
Nicaragua	13	23.15	34.57	45.05
Netherlands	18	57.94	70.96	81.57
Nigeria	9	12.67	22.18	26.66
Norway	24	27.38	37.59	45.00
Oman	19	6.12	6.12	6.12
Pakistan	8	10	18.75	45.62
Panama	24	22.57	30.06	56.71

Table 1: Country in the dataset cont.

Country	*Obs*	*TW(lowest)*	*TW(mean)*	*TW(highest)*
Papua New Guinea	13	16.51	17.12	46.82
Paraguay	22	22.23	22.23	22.23
Peru	23	30.82	31.90	54.24
Philippines	19	2.20	19.48	36.75
Poland	11	47.88	47.92	58.82
Portugal	24	36.54	45.24	55.53
Puerto Rico	24	23.68	31.23	44.13
Romania	19	37.46	41.42	63.21
Russian Federation	19	32.53	36.55	46.23
Senegal	18	21.77	21.77	57.21
Singapore	22	37.79	45.12	54.58
Slovak Republic	11	45.96	55.32	66.25
Solomon Islands	15	22.41	32.96	51.50
South Africa	17	17.63	18.045	43.69
Spain	23	42.68	47.98	65.57
Sri Lanka	9	28.7	29.17	48.98
St. Lucia	24	17.46	33.13	38.75
Sri Lanka	9	28.7	29.17	48.98
St. Lucia	24	17.46	33.13	38.75
St. Vincent-Grenadines	6	13.70	33.11	55
Swaziland	18	22.83	34.60	43.77
Sweden	20	41.24	49.51	53.21

Table 1: Country in the dataset cont.

Country	*Obs*	*TW(lowest)*	*TW(mean)*	*TW(highest)*
Taiwan	16	12.67	16.02	49.34
Tanzania	24	26.95	26.95	58.68
Thailand	13	7.22	9.08	38.93
Uganda	24	22.06	30.29	53.11
Ukraine	7	39.35	45.38	55.90
United Kingdom	24	32.74	34.18	50.32
United States	24	28.53	39.20	41.23
Uruguay	24	24.19	24.19	24.19
Venezuela	22	16.40	20.59	40.34
Vietnam	11	28.35	28.35	68.08
Zambia	12	20.55	26.93	41.21
Zimbabwe	15	23.01	41.01	50.80

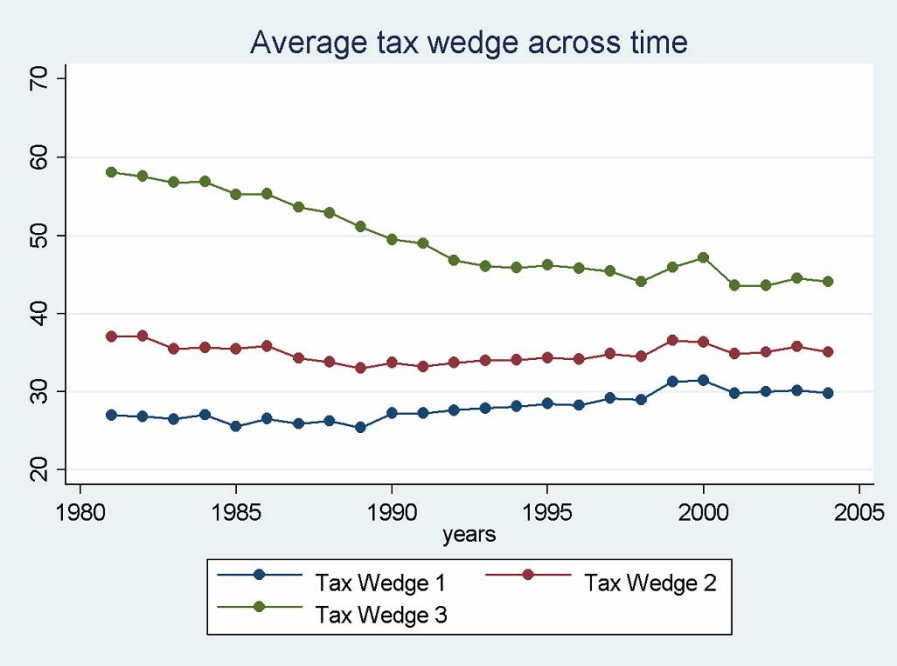

Figure 1: Average Tax Wedge over time.

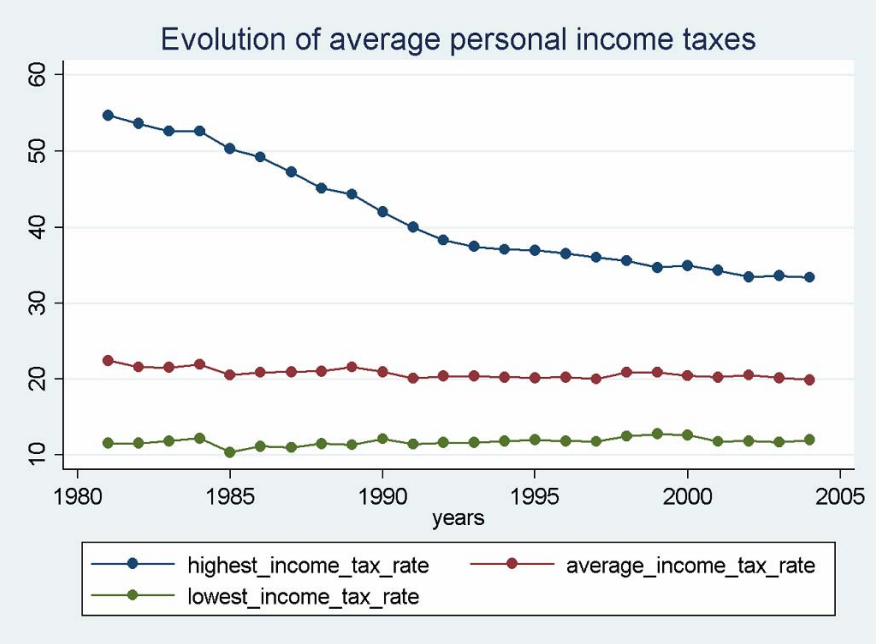

Figure 2: Average of Personal Income Tax over time.

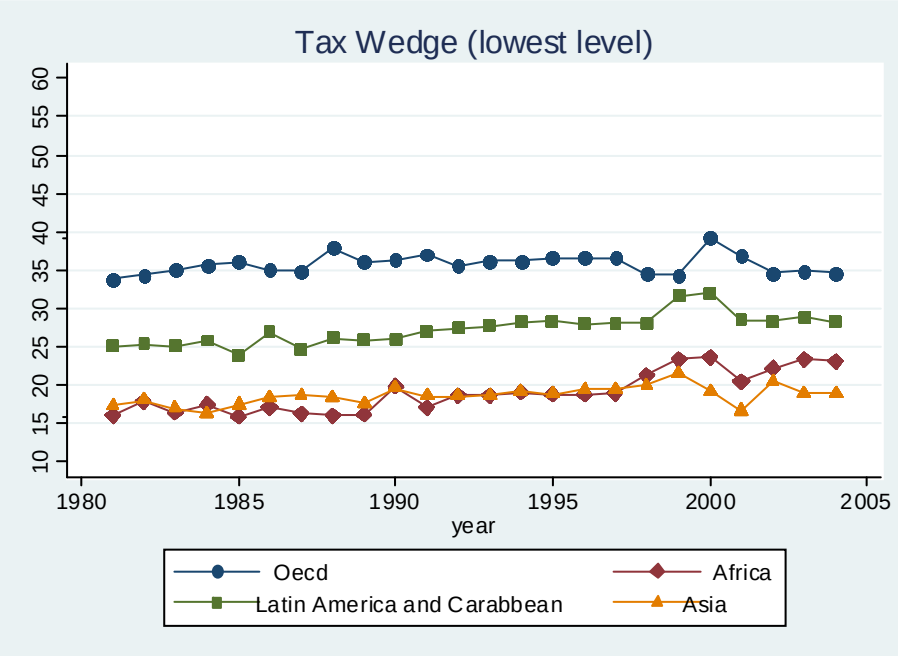

Figure 3: Evolution for regions, tax wedge 1

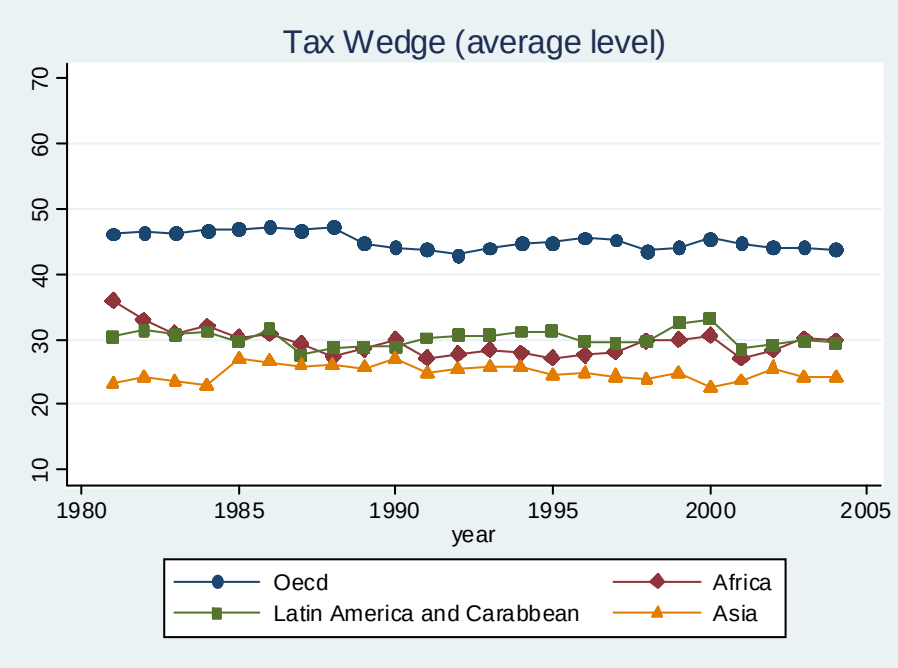

Figure 4: Evolution for regions, tax wedge 2

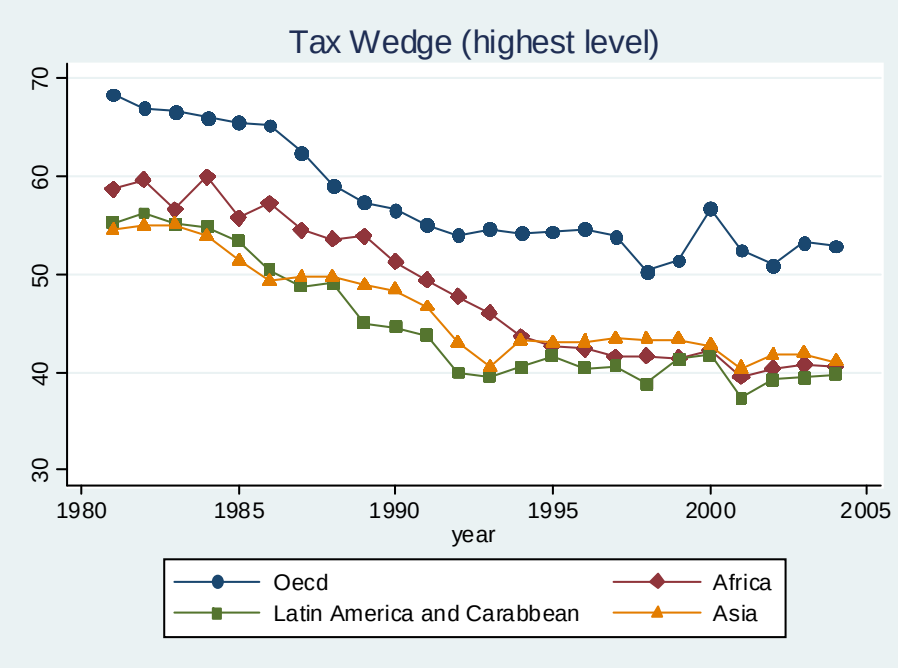

Figure 5: Regions, tax wedge 3

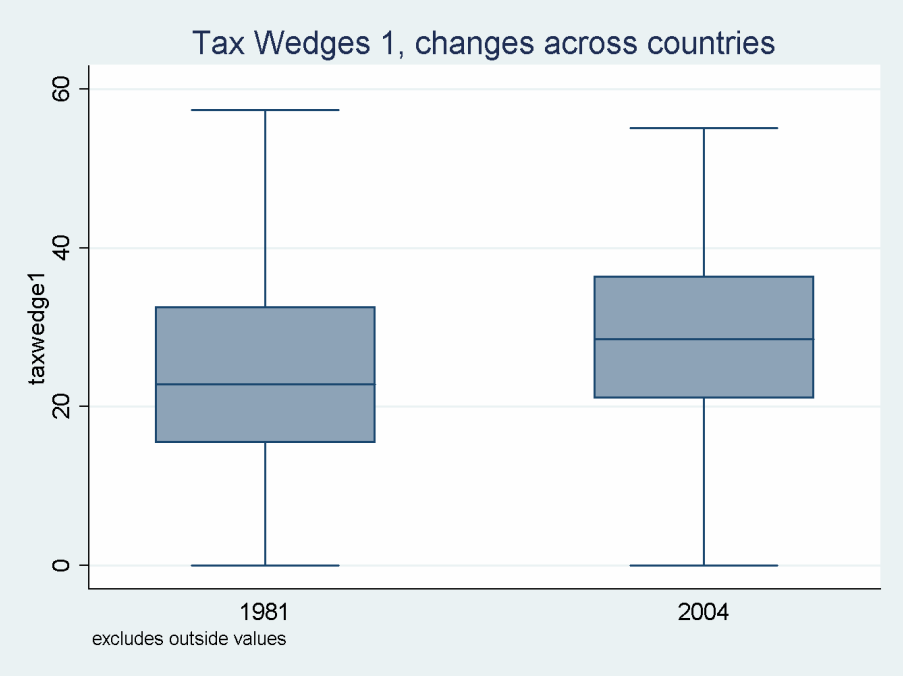

Figure 6: Tax Wedge 1: Changes across countries

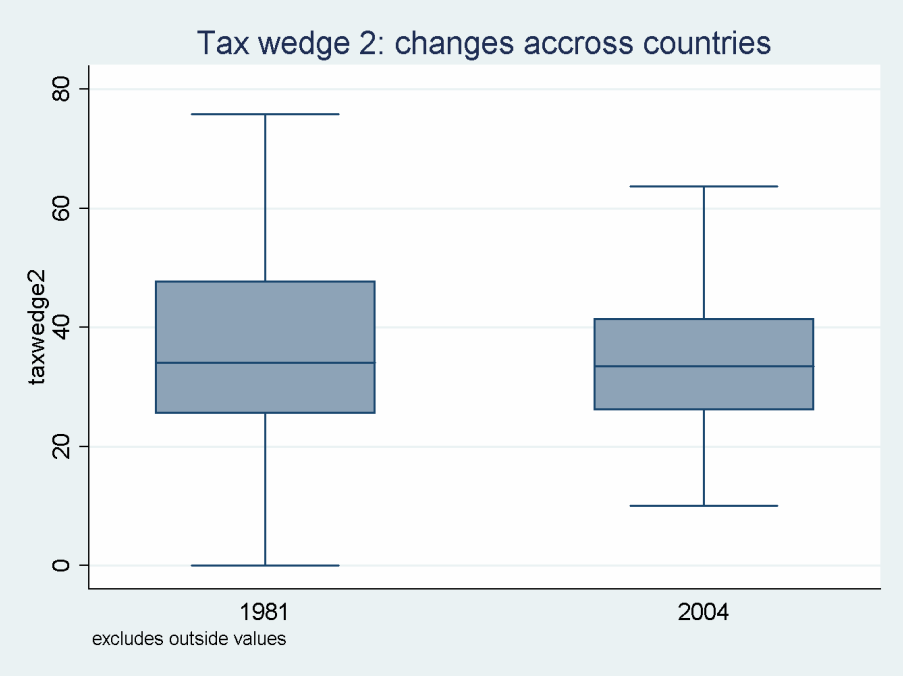

Figure 7: Tax Wedge 2: Changes across countries

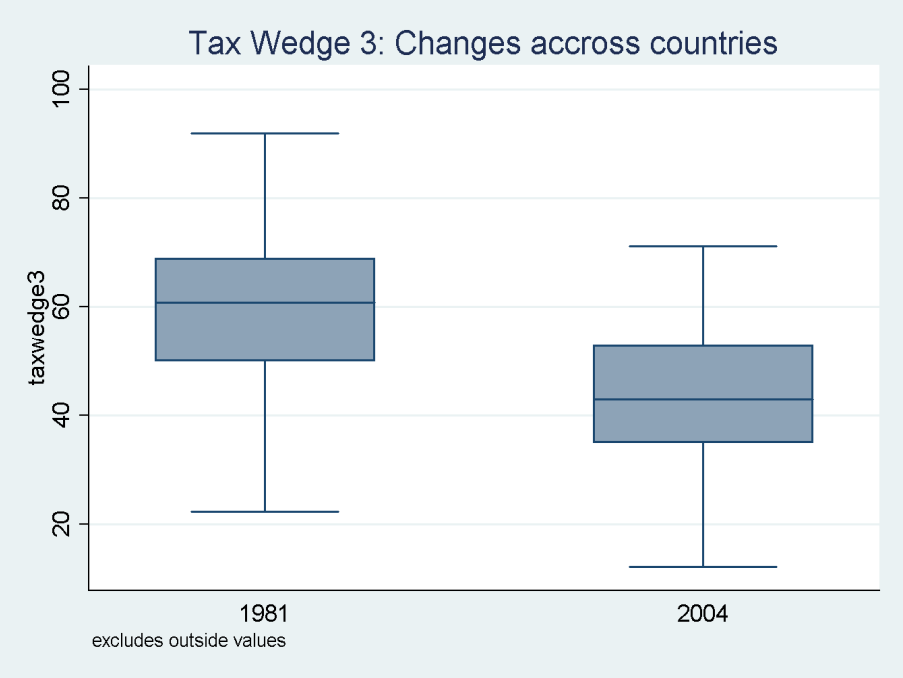

Figure 8: Tax Wedge 3: Changes across countries

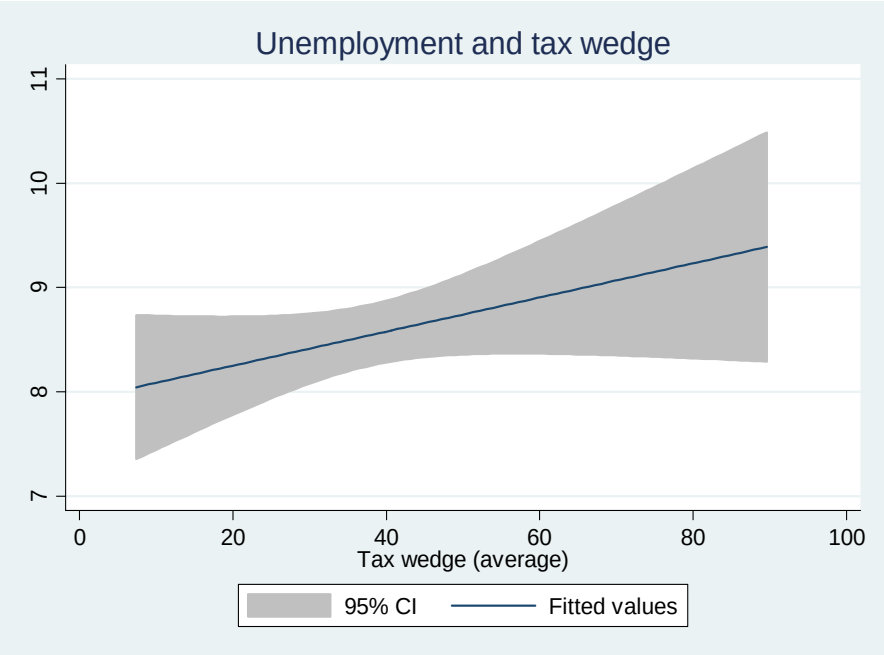

Figure 9: Unemployment and tax wedge

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev
Unemployment rate	1629	8.51	5.61
Log of GDP per capita	2324	8.002	1.51
Vat	1722	10.33	8.92
UB	1647	0.19	0.24
Severance payments	1656	8.19	9.46
Minimum/mean wage	1109	0.34	0.22

Table3. Effect on unemployment tax wedge (lowest level)

	(1)	(2)	(3)
	Unemployment rate	Unemployment rate	Unemployment rate
Tax wedge 1	0.047**	0.046**	0.032*
	(0.018)	(0.018)	(0.017)
Severance payments	0.083***	0.064*	0.105***
	(0.031)	(0.033)	(0.034)
Minimum/mean wage	-1.000	-0.766	-0.349
	(1.113)	(1.118)	(1.067)
UB	9.612***	9.486***	14.383***
	(1.512)	(1.511)	(1.553)
Ln Gdp per capita	-4.946***	-6.374***	-9.353***
	(0.651)	(1.010)	(1.066)
Vat	0.051*	0.026	0.021
	(0.030)	(0.033)	(0.032)
Trend		0.059*	0.246
		(0.032)	(0.217)
Constant	45.982***	58.056***	80.781***
	(5.454)	(8.510)	(8.858)
Observations	631	631	631
Country FE	yes	yes	yes
Trend*region dummies	no	no	yes
R^2	0.155	0.160	0.258

Standard errors in parentheses

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

Table4. Effect on unemployment tax wedge (average level)

	(1)	(2)	(3)
	Unemployment rate	Unemployment rate	Unemployment rate
Tax wedge 2	0.040**	0.038**	0.026*
	(0.017)	(0.017)	(0.016)
Severance payments	0.082***	0.064*	0.104***
	(0.031)	(0.033)	(0.034)
Minimum/Mean wage	-0.859	-0.632	-0.252
	(1.110)	(1.115)	(1.064)
UB	9.680***	9.554***	14.438***
	(1.513)	(1.512)	(1.552)
Ln Gdp per capita	-5.082***	-6.479***	-9.444***
	(0.653)	(1.010)	(1.065)
Vat	0.063**	0.039	0.030
	(0.030)	(0.033)	(0.031)
Trend		0.058*	0.194
		(0.032)	(0.215)
Constant	46.995***	58.829***	81.479***
	(5.430)	(8.495)	(8.834)
Country FE	yes	yes	yes
Trend*region dummies	no	no	yes
Observations	631	631	631
R^2	0.154	0.159	0.257

Standard errors in parentheses

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

Table 5. Effect on unemployment tax wedge (highest level)

	(1) Unemployment rate	(2) Unemployment rate	(3) Unemployment rate
Tax wedge3	0.007	0.023	0.026
	(0.016)	(0.017)	(0.016)
Severance payments	0.087***	0.065**	0.107***
	(0.032)	(0.033)	(0.034)
Minimum Mean wage	-0.775	-0.550	-0.212
	(1.117)	(1.117)	(1.063)
UB	9.595***	9.310***	14.300***
	(1.524)	(1.523)	(1.557)
Ln Gdp per capita	-4.863***	-6.554***	-9.602***
	(0.707)	(1.013)	(1.067)
Vat	0.065**	0.033	0.023
	(0.030)	(0.033)	(0.032)
Trend		0.082**	0.201
		(0.035)	(0.215)
Constant	46.088***	59.493***	82.191***
	(6.271)	(8.509)	(8.806)
Observations	631	631	631
Country FE	yes	yes	yes
Trend*region dummies	no	no	yes
R^2	0.146	0.154	0.257

Standard errors in parentheses

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

Table 6 Effect on unemployment, progressiveness (lowest level of tax wedge)

	(1) UN	(2) UN	(3) UN	(4) UN	(5) UN	(6) UN
Tax Wegde 1	0.062***	0.042**	0.075***	0.056**	0.050**	0.046**
	(0.021)	(0.021)	(0.022)	(0.022)	(0.021)	(0.021)
progressiveness	0.017	0.079***	0.035**	0.097***	0.021	0.056**
	(0.012)	(0.021)	(0.014)	(0.022)	(0.013)	(0.023)
Density*progressiveness		-0.003***		-0.003***		-0.002*
		(0.001)		(0.001)		(0.001)
Severance Payments	0.089***	0.086***	0.064*	0.062*	0.102***	0.099***
	(0.032)	(0.031)	(0.033)	(0.032)	(0.034)	(0.034)
Minimum Mean Wage	-1.148	-0.995	-0.902	-0.796	-0.459	-0.418
	(1.117)	(1.109)	(1.114)	(1.104)	(1.068)	(1.079)
UB	9.482***	9.674***	9.133***	9.342***	14.081***	13.173***
	(1.514)	(1.473)	(1.510)	(1.468)	(1.562)	(1.573)
Ln Gdp per capita	-4.612***	-4.252***	-6.699***	-6.307***	-9.441***	-8.868***
	(0.693)	(0.696)	(1.014)	(1.007)	(1.066)	(1.090)
Vat	0.054*	0.098***	0.016	0.058*	0.015	0.044
	(0.030)	(0.032)	(0.033)	(0.035)	(0.032)	(0.035)
Trend			0.101***	0.100***	0.137***	0.130***
			(0.036)	(0.035)	(0.041)	(0.041)
Constant	42.127***	38.982***	58.712***	55.504***	80.342***	76.006***
	(6.112)	(6.160)	(8.474)	(8.490)	(8.850)	(9.127)
Observations	631	595	631	595	631	595
Country FE	yes	yes	yes	yes	yes	yes
Trend*region	no	no	yes	no	no	yes
R^2	0.158	0.193	0.169	0.204	0.261	0.263

Standard errors in parentheses

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

Table 7. Effect on unemployment, progressiveness (average level of tax wedge)

	(1) UN	(2) UN	(3) UN	(4) UN	(5) UN	(6) UN
Tax wedge 2	0.043**	0.031*	0.046***	0.034**	0.031*	0.029*
	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)	(0.017)
progressiveness	0.007	0.075***	0.019	0.088***	0.011	0.047**
	(0.011)	(0.021)	(0.012)	(0.022)	(0.012)	(0.022)
progressiveness*density		-0.003***		-0.003***		-0.002*
		(0.001)		(0.001)		(0.001)
Severance payments	0.084***	0.082***	0.064*	0.061*	0.102***	0.099***
	(0.032)	(0.031)	(0.033)	(0.032)	(0.034)	(0.034)
Minimum/Mean wage	-0.896	-0.817	-0.639	-0.579	-0.272	-0.229
	(1.112)	(1.101)	(1.114)	(1.100)	(1.064)	(1.074)
UB	9.633***	9.774***	9.383***	9.521***	14.308***	13.347***
	(1.516)	(1.473)	(1.514)	(1.470)	(1.559)	(1.571)
Ln Gdp per capita	-4.956***	-4.471***	-6.691***	-6.273***	-9.516***	-8.904***
	(0.682)	(0.689)	(1.018)	(1.009)	(1.068)	(1.093)
Vat	0.066**	0.109***	0.037	0.078**	0.029	0.060*
	(0.030)	(0.032)	(0.033)	(0.034)	(0.031)	(0.034)
Trend			0.081**	0.085**	0.124***	0.116***
			(0.035)	(0.035)	(0.040)	(0.041)
Constant	45.547***	41.088***	59.629***	55.884***	81.554***	76.830***
	(5.882)	(5.979)	(8.501)	(8.507)	(8.836)	(9.130)
Observations	631	595	631	595	631	595
Country FE	yes	yes	yes	yes	yes	yes
Trend*region	no	no	yes	no	no	yes
R^2	0.154	0.192	0.162	0.200	0.258	0.261

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

Table 8. Effect on unemployment progressiveness (highest level of tax wedge)

	(1) UN	(2) UN	(3) UN	(4) UN	(5) UN	(6) UN
Tax wedge 3	0.012	-0.002	0.022	0.008	0.031*	0.025
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
progressiveness	-0.006	0.075***	0.002	0.083***	-0.007	0.033
	(0.013)	(0.023)	(0.013)	(0.023)	(0.013)	(0.024)
progressiveness* density		-0.003***		-0.003***		-0.002*
		(0.001)		(0.001)		(0.001)
Severance payments	0.086***	0.083***	0.066**	0.063*	0.108***	0.104***
	(0.032)	(0.031)	(0.033)	(0.032)	(0.034)	(0.034)
Minimum / Mean wage	-0.781	-0.686	-0.546	-0.481	-0.215	-0.174
	(1.118)	(1.104)	(1.119)	(1.103)	(1.063)	(1.074)
UB	9.601***	9.796***	9.304***	9.508***	14.326***	13.394***
	(1.525)	(1.478)	(1.525)	(1.478)	(1.559)	(1.571)
Ln Gdp per capita	-4.890***	-4.476***	-6.569***	-6.156***	-9.583***	-8.944***
	(0.710)	(0.709)	(1.022)	(1.010)	(1.068)	(1.095)
Vat	0.063**	0.110***	0.033	0.079**	0.023	0.054
	(0.031)	(0.032)	(0.033)	(0.035)	(0.032)	(0.034)
Trend			0.083**	0.083**	0.142***	0.131***
			(0.036)	(0.036)	(0.042)	(0.043)
Constant	46.271***	42.423***	59.618***	55.939***	81.992***	77.241***
	(6.288)	(6.322)	(8.582)	(8.563)	(8.819)	(9.122)
Observations	631	595	631	595	631	595
Country FE	yes	yes	yes	yes	yes	yes
Trend*region	no	no	yes	no	no	yes
R^2	0.146	0.187	0.154	0.195	0.257	0.259

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

CHAPTER 2: Academic Dynasties. Familism and Productivity in the Italian Academia

Giovanna Labartino*

Abstract

Extensive anecdotal evidence suggests that practices related to familism are widespread in Italian universities. However, systematic evidence is not available since information on family relations is generally unavailable or confidential. We explore the relevance of family connections in the Italian academia as well as the relationship between familism and scientific production using data on Italian university professors with a particular focus on the informative content of professors' last names. We construct an index of academic 'homonymity' (AHI) by comparing the relative frequency of a last name in each academic unit with its relative frequency in the population of the area in which the university is located derived from data from the Italian fiscal census. Our index provides an intuitive measure of how disproportionately common a certain last name is within a specific academic unit relative to the overall underlying population. We then use the index to investigate differences across academic units in the relevance of family connections. Our results are highly consistent with the anecdotal evidence and show significant differences across regions, universities, and disciplines. Finally, with regard to the relationship between the strength of family connections and academic productivity, our results show that universities which score higher in our homonymity measure tend to be characterized by poorer academic performance, especially in terms of research achievement. Interestingly, we also find a strong negative correlation between our index of homonymity and standard measures of interpersonal trust in the area where the university is located.

*Some sections of this chapter will be part of the paper *Academic Dynasties* joint with Ruben Durante Brown University, Department of Economics and Roberto Perotti IGIER, Bocconi University.

1 Introduction

The issue of weather family relations have a positive impact on productivity has been widely debated in industrial organization. For example, some have argued that family-owned and family-run businesses may exhibit significant gains in productivity due to the unification of ownership and control. To what extent may a similar mechanism operate in the context of academia? This project explores the relevance of family connections and their potential impact on scientific production in the context of the Italian university system.

Extensive anecdotal evidence suggests that practices related to nepotism [1] are widespread in Italian universities. In March 2005, for example, the University of Bari was involved in a major scandal which newspapers referred to as "family affairs". Journalists' investigations showed that a number of faculty members from several academic departments were relatives. In many cases the same last name appeared repeatedly on professors' office doors. Although the case of Bari may represent an extreme example of this phenomenon, it is by no means an isolated case in the Italian university system. Similar cases have been reported for the University of Cagliari, Calabria, Bologna, Modena and Reggio-Emilia, Florence, Naples, Rome and Messina[2]. This project aims to provide systematic evidence of the relevance of family connections within Italian academia. .

To this end, we use an original data set on professors' last names

[1] According to the Merriam-Webster Dictionary the term nepotism means "favoritism (as in appointment to a job) based on kinship".

[2] For examples of press coverage concerning these cases see "La parentopoli dell'università. Ecco tutti i figli di", by Paolo Posterano, in *Il Riformista*, July 11th 2008, and "Il prof tiene famiglia", by Antonio Rossitto and Antonella Palmieri, in *Panorama*, January 25th 2008.

available from the Italian Ministry of University and Research (MIUR)[3]. The MIUR data cover all professors employed in both private and public universities and include information on professors' first and last name, university and department of affiliation, discipline, and position.

We construct an academic homonymity index (AHI) by comparing the relative frequency of each last name in each academic unit (department, faculty, university) with its relative frequency in the population of the province and the region in which the university is located. Data on the distribution of last names in the Italian population were primarily obtained from the Italian fiscal census. Our index is meant to provide an intuitive and coherent measure of how common a certain last name is within a specific academic unit relative to the overall underlying population. Intuitively, that a certain last name is significantly more common within an academic unit than within the population from which professors are drawn from may suggest, though not necessarily, that the selection process is based on criteria other than academic merit, *in primis*, on family ties.

Our measure allows us to investigate differences across universities and across disciplines in terms of the relevance of family connections. For example, when ranking Italian universities based on their departments'average score in our homonymity index, we find that the universities of Messina, Bari, and Catania occupy the top three positions, a result consistent with the extensive anecdotal evidence mentioned above. With regard to differences across disciplines, the area of medicine is characterized by the highest score

[3]Data are available at the MIUR-CINECA website: http://cercauniversita.cineca.it.

in our homonymity index, followed by veterinary and agriculture. Interestingly, we also find a negative correlation between our index of homonymity and standard measures of interpersonal trust in the area where the university is located. In light of previous findings (Banfield, 1958, Alesina and Giuliano, 2007) we interpret this result as evidence that, even in the context of the university system, in areas characterized by low levels of generalized trust, family ties tend to play a more important role. The chapter is structured as follows: Section 2 briefly summarizes the related literature. Section 3 describe how the Italian university system works; Section 4 presents the data used in the analysis; Section 5 shows the construction, Section 6 describes the empirical strategy and the results. Section 7 presents some results on social trust. Section 8 concludes and presents ideas for further research.

2 Literature review

Labor economists have extensively investigated the role played by social networks in individuals' job search.

Using ECHP data Pellizzari (2007) investigates differences in wages and productivity across jobs found through different channels and finds that those jobs obtained through informal networks are generally of better quality and pay higher wages. Kramarz and Skans (2006) study the role of family networks in the Swedish labor market, particular focusing on young workers seeking first occupation after completing school. Their findings suggest that family connections are indeed very valuable, especially for low-educated males

who are likely to be hired in the same place as their fathers.

Focusing on Italy, Sylos Labini (2007) finds that in areas with low social capital individuals tend to rely more heavily on the help of family members to find a job. Following Guiso et al. (2004), Sylos Labini uses turnout in referenda and blood donations as proxies for social capital. An alternative approach, employed by Alesina and Giuliano (2008) among others, is to use the average score in survey questions - such as those included in the European Social Survey - on generalized trust and the importance of family. We will use both of these approaches in our empirical analysis in order to test the relationship between civic mindedness and our measure of family connections in academia.

Recent contributions have also investigated the importance of family connections within specific professions. One example is Dal Bo et al. (2007) who study political dynasties in the United States Congress since 1789. They find that family connections are more relevant among politicians than in other occupations, and that legislators that enjoy longer tenures are significantly more likely to have relatives entering Congress later.

The perception of what determines who has access to a certain career is also likely to affect individuals' *ex ante* incentive to invest in profession-specific human capital. In the case of academia, for example, the perception that those individuals with a strong family network may be advantaged when competing for academic jobs may deter potentially high-quality candidates lacking such connections from pursuing an academic career. From a theoretical point of view this issue is not dissimilar from the potential effect of discrimination

and affirmative action policies on individual propensity to invest in human capital (Fryer and Loury, 2007), another stream of the literature to which our contributions is partly related.

From an empirical point of view identifying family connections within a certain population is usually not an easy task since this kind of information is generally unavailable or otherwise confidential. To overcome these limitations, we exploit the informative content of professors' last names. In fact, since there is a relatively small number of last names in the entire population, individuals with the same last name are likely to have family ties. As a consequence, last names can potentially provide valuable information about family connections. The use of last names is not new in economics. Angelucci et. al (2007) use last names to identify family bonds to explore the impact of the Progresa program in Mexico. Similarly, Acemoglu et al. (2007) use names and last names of municipalities' mayors in Cundinamarca between 1875 and 1895 to construct an index of political concentration, and to study how a restricted number of influential families monopolized local political power. Guell et al. (2007) exploit the informative content of last names to investigate intergenerational mobility in Catalonia using cross-sectional Census data[4]. Finally, in a very recent contribution, Brenner and

[4]Their empirical strategy can be summarized as follows. They start by estimating two separate regressions. In the first specification they regress an index of individual economic wellbeing on a dummy for the individual's last name as well as a whole range of individual controls. This allow them to measure what part of the outcome of interest can be inferred from his/her last name. The high R-square of the regression suggests that indeed last names can explain a significant fraction of the variation. The second regression has the same structure as the first one; in this case, however, the last name dummy is related to a fake surname drawn from the same distribution as the actual surnames and randomly assigned to each individual. The difference between the R-square of the two regressions provide a measure of what they define as the Informative Content of Surnames (ICS). The authors then use the ICS to model the link between income and last names in order to understand the underlying mechanism through which last names relate to individual economic well being, and whether this operates through intergenerational mobility. Finally, they apply the model to investigate the evolution

Rubinstein (2008) use differences in last names between Jewish individuals with one ashkenazi and one sephardic parent to study the effect of discrimination in the Israeli labor market.

Finally our work is also related to the literature on the functioning of academic systems, and of the Italian one in particular. Gagliarducci et al. (2005), for example, try to explain the extreme localism that characterizes Italian academia and the inability of Italian universities to attract foreign researchers. The authors argue that these issues are not due to a lack of financial resources but rather to a lack of proper incentives reflected, for example, in academic wages based on seniority rather than on actual research performance. Perotti (2002, 2008) provides a comprehensive description of the Italian academic system with a particular focus on recruitment procedures. He compares the British and the Italian academic systems, emphasizing the latter's systematic lack of meritocracy and the inefficient use of resources. He also provides extensive evidence of widespread nepotism in some Italian universities as well as recommends how to improve the overall quality of Italian academia. Finally, beyond the Italian context, Shimbori (1964) provides an interesting picture of the Japanese academic system during the 1960s. Using information from several editions of the World's *Who is Who*, combined with a number of ethnographic sources, he stresses the differences between the Japanese academic system, and those of France, West Germany, the United Kingdom and the US. He finds that most Japanese professors are former students of the university at which they are employed. Also, professors perceive the institution they work for as a sort of "family firm", and are extremely reluctant

of intergenerational mobility.

to transfer to other universities despite the prospect of higher wages. According to the author, this pattern can be attributed, at least in part, to specific traits of Japanese culture.

3 On the Italian university system

Before proceeding to the empirical analysis, we provide a brief overview of the rules and procedures that govern the Italian university system.

Each Italian university (*ateneo*) is divided into different faculties (*facoltà*) and departments (*dipartimenti*). While teaching activities are organized around the faculties, research is organized around the departments which group professors with homogenous research interests. Each professor belongs to a specific faculty and to one (or more) departments.

Professors' recruitment and promotion is regulated by the Italian Ministry of University and Research (MIUR). The Italian university system is not characterized by a a true tenure process. There are three levels of seniority: a) assistant professor (*ricercatore*), associate professor (*professore associato*), and full professor (*professore ordinario*). Researchers at all three levels are subject to an initial trial period of three years, at which point they are required to pass a formal review process in order to maintain their position. As pointed out by Perotti (2002) and Checchi (2000), the confirmation process is *de facto* a formality and only very rarely are professors denied confirmation by the evaluation committee.

The process of promotion to full professorship can be summa-

rized as follows. A university that wants to fill a vacancy is required to start a local public competition (*concorso*). Each *concorso* requires the formation of a committee of five full professors - one appointed by the university and the remaining four elected among the full professors in the discipline. The committee is responsible for the evaluation of candidates' scientific production and for the selection of the three winning candidates (*idonei*). The university then has the choice to appoint one of the winners; the remaining two can be hired by any other university within three years. The recruitment procedures were changed in 1998. The previous system - that had been in place since 1980 - was based on a nationwide public competition held every few years and open to all candidates in a particular discipline. The national committee would nominate a number winners equal to the total number of vacancies.[5]. Most commonly, a researcher spends his entire career - from assistant to full professorship - within the same university. In practice, the process of selection and promotion is often unrelated to the candidate's actual scientific achievements. Indeed, in several cases, less qualified candidates were preferred over those with higher quality profiles (for a detailed description of some of these cases see Perotti, 2008).

4 Data

In what follows we briefly describe the different kind of data that we employ in our empirical analysis: a) data on university professors'

[5]For an extensive description of the old procedures and a comparison between the old and the new system see Perotti 2002.

individual characteristics (both cross sectional and panel); b) data on the frequency of last names in the Italian population; c) data on academic performance.

4.1 Data on professors

Both the cross-sectional and the panel data on university professors are from the Italian Ministry of University and Research (MIUR). The cross sectional data include information on all professors employed in all Italian universities (public and private) in 2005. Table 1 presents an example of the data set for a small sample of the academic population (including all professors from the University of Bari with last name starting with the letter Z). Overall, the data set covers 78 universities and over 700 faculties. The (unbalanced) panel data include information for all professors between 1988 and 2008 (on average around 50,000 observations per year) including gender, date and place of birth, year of first hire, date of confirmation, faculty and department of affiliation as well as an anonymous identifier that allow us to follow each individual over time.

4.2 Data on last names in the population

Data on the frequency of last names in the Italian population are primarily obtained from the fiscal census. The data cover all individuals residing in the Italian territory who pay taxes to the Italian IRS. The data set includes the number of occurrences of each last name in each Italian province as well as the corresponding percentage calculated over the total population of taxpayers. The data in our possession do *not* include information on individuals' reported in-

come but uniquely aggregate information on taxpayers' last names. The obvious limitation of using data from the fiscal census is that they do not cover those individual who do not pay taxes. However, this limitation would only apply to total tax evaders - those individuals who do not report any revenue to the IRS - and not those who simply underreport their income. Overall, however, the data represents well the Italian working age population. A complementary source would be data from the Italian phone book directory (www.paginebianche.it). The use of this data is also characterized by some serious limitations since they do not account for all those individuals who do not have a land line, and the members of the household other than the person under whose name the line is registered (particularly women and younger people). Ideally, the most comprehensive data would be those collected by the National Office of Vital Statistics (*Anagrafe*) which, however, are not easily available to the public. Table 2 provides a summary of the data from the fiscal census for the provinces of the capitals of the twenty Italian regions in 2005. For each province we report the number of total last names recorded, the mean and the maximum number of occurrences, and the most common last name.

4.3 Data on academic performance

With regard to measures of universities' academic performance we use data from the annual reports on Italian universities edited by CENSIS (*Centro Studi Investimenti Sociali*)[6] for the years between

[6]Founded in 1964, CENSIS is an independent research institute operating in the area of social sciences and economics. Over the last decades CENSIS has conducted numerous research projects for a variety of clients ranging from public administration to private companies to international organizations. Its areas of expertise include: education, labor market, welfare

2001 and 2006.

CENSIS annual reports include a detailed ranking of the Italian universities disaggregated by discipline. A university's position in each ranking is based on its score in each of the following criteria:

a) *Productivity*: based on students' average GPA and on the fraction of students that graduate within the expected time.

b) *Research*: based on funding and grants received by the Italian Ministry for University and Research to finance research projects of national interest(PRIN)

c) *Professors' profile*: based on the age profile of faculty members.

d) *International relationships*: based on the university's relations with foreign partner institutions and on the total number of foreign students and faculty members hosted during the academic year.

e) *Overall performance*: average of the score in the five criteria described above.

We use the average of each of these indexes over the period years 2001-2006 as our dependent variable.

To further test our hypothesis we use additional data on academic performance available from the Conference of Italian Universities Rectors (CRUI). The CRUI data are elaborated from bibliometric scores based on the ISI- Thomson "World of knowledge" database.

For each disciplinary area the data include measures of:

a) *Research productivity*: number of publications divided by the number of researchers

policies, health system, local development, logistics and transportation, energy, environmental and territorial policy, information and communication technologies, mass-media and communication. More information can be found on the Institute web site at: www.censis.it.

b) *Research visibility*: number of citations divided by the number of researchers

5 Construction of the index

In what follows we briefly illustrate the procedure used to construct the academic homonymity index (AHI) as well as the main properties of the index. As mentioned above, the AHI is based on the comparison of the relative frequency of professors' last names within a given academic unit with their relative frequency in the overall population in a geographic unit of reference.

The AHI for academic unit j relative to the population in geographic unit k is given by:

$$AHI_{jk} = \frac{1}{N_j} \sum_{i=1}^{N*_j} \log(\frac{g_{ij}}{r_{ik}})$$

where g_{ij} represents the fraction of professors with last name i in academic unit j, r_{ik} is the fraction of individuals with last name i in the population of the geographic unit k, and N_j is the total number of last names represented in academic unit j. Our index is aimed to capture cases of homonymity among professors, and *not* how common or uncommon professors' last names are in general. For this reason, when constructing the index, we restrict our attention to those last names that appear more than once in a given academic unit. The academic unit of interest (j) can be either a university, a faculty or a department within a given university, a discipline or a

scientific area ($S.S.D$).

With regard to the choice of the geographic unit of reference several options are available. One possibility is to consider the population of the province where the university's main campus is located, or, alternatively, the population of the region where the main campus is located.[7] In some cases, however, professors may reside in areas which, despite being very close to the university location, fall in the territory of another region. One example is the province of Reggio Calabria which, despite being part of another region, is closer to the campus of the University of Messina than other provinces in Sicily (and even closer than several districts within the province of Messina itself). One way to address this concern is to consider, for each university, the set of surrounding provinces, composed by all those provinces that fall within a given distance from the university's main campus. This is precisely the approach we use to construct an alternative version of our index. We chose 40km as a reasonable commuting distance.[8] Another source of concern is given by the fact that several Italian universities have multiple campi, sometimes in very distant locations or in different regions. One example is the University of Bologna, which has secondary campi in Forlì, Rimini, Cesena, and Ravenna. In principle, professors affiliated with a given university, but who are assigned to a secondary campus, may decide to reside closer to the place where their actual professional activity takes place rather than where the university's main campus is

[7]The use of this criteria, which would be hard to justify in a very open and mobile academic market such as the American one, seems rather realistic in the Italian context which is characterized by very low mobility and in which, as mentioned above, most professors originate from areas surrounding the university where they teach. Table 3 shows the percentage of professors born in the same regions or in the same province where the university is located.

[8]However, adopting a different distance (e.g. 30km or 50km) does not change the qualitative results discussed below.

located. Therefore, considering the province (or region) where the main campus is located as the geographic unit of reference may be misleading. To address this concern, we construct another version of the index considering all those provinces where both primary or secondary campi are located. The maps presented in the last pages of the chapter provide a graphical representation of the criteria used to construct the different versions of the AHI. Table 4 summarizes the different academic units and the relative populations of reference used to construct the different versions of the index.

The AHI, as described above, presents the following properties:

a) It equals 0 when no cases of homonymity are found in a given academic unit;

b) For a given set of last names appearing more than once, it is increasing in the number of individuals sharing the same last name (e.g. higher score when 6 individuals, rather than only 3, share the same last name);

c) For a given number of individuals sharing the same last name, it is higher the more uncommon the last name is in the population of reference (e.g. higher score when 2 professors share a last name which appears only 4 rather than 100 times in the overall population).

6 Results

In this section we present some findings based on the distribution of universities' score on our homonymity index. As mentioned above,

we construct four versions of the index based on different criteria of geographic proximity to the university: province of the main campus, region of the main campus, surrounding provinces, provinces of the primary and secondary campi. It is worth noticing that, overall, the universities' ranking does not vary significantly when different versions of the index are considered; this is reassuring of the fact that our measure is robust to different specification of the population of reference.

6.1 Differences across universities

Table 5 presents the ranking of the Italian universities based on the score on our AHI measure, for each of the four versions of the index[9]. The score of each university is given by the average score of all its departments.

The universities of Messina, Bari and Catania display the highest levels of homonymity in all four specifications. A result which is not surprising in light of the anecdotal evidence presented above. The descriptive statistics suggest the existence of considerable differences across geographic areas with universities located in the South generally displaying high levels of homonymity relative to those located in the Center and in the North of the country. We also look at differences in AHI scores across discipline. To do so, we calculate the AHI for all professors in a given discipline in each university, and average it across all universities in which that discipline is represented. According to our results, among all disciplines Medicine appear to be the area where cases of "over-represented homonymity" are the

[9]The universities are ranked according to the AHI's version relative to population in the region where the main campus is located, data refer to 2005

most frequent, followed respectively by Veterinary, and Agriculture (Table 6).

6.2 Observed vs.Simulated Homonymity

In principle, for those academic unit displaying very high values of the homonymity index, we would be interested in testing the hypothesis that these high scores are generated by a random selection process from the underlying population. One way to do so is, for each academic unit, to simulate a large number of random draws from the underlying population of last names, calculate the corresponding AHI, and finally compare the observed value of AHI with the resulting artificial distribution. For example, consider the academic unit j composed by n_j professors, the corresponding geographic unit k, and the observed value AHI_{jk}.

Since we know the entire distribution of last names in unit k, we can simply ask the computer to draw a random sample of size n_j from the underlying population of unit k, and to compute the corresponding value of the index based on the relative frequency of the last names in the sample. By repeating this procedure for a sufficiently large number of times, we can obtain a whole distribution of artificially generated AHI. Finally, by comparing AHI_{jk} to the corresponding simulated distribution we can test the hypothesis that AHI_{jk} was generated by a similar random sampling process from the underlying population.

We apply this procedure to individual departments using the province as geographic unit of reference. For each department we simulate 100,000 random draws. Table 7 shows the results for the

fifty departments with highest homonymity scores. On the base of the p-values reported in the last column, we can generally reject the hypothesis that such high homonymity scores might be generated by a random process (the significance level ranging between 1% and 5% for most of the cases). Fig1 shows the simulated distribution of the index in the province of Bari compared with the true one, indicated by the triangle.

6.3 Nepotism and academic performance

Finally, we explore the relationship between nepotism and academic performance. As mentioned above, the data from CENSIS cover various aspects of academic activity thus allowing us to analyze different aspects of universities' performance.

We start by looking at universities' performance in the area of research. In Figure 2 we plot the average CENSIS score for research between 2001 and 2006, and our regional version of the academic homonymity index. The figure suggests the existence of a negative relationship between the two variables: faculties scoring higher in our homonymity index also tend to have lower research score. As depicted in Table 8, this result is robust to the introduction of geographic macro areas fixed effects; this finding addresses, at least in part, the concern that our index may simply capture differences across regions. Looking at the effect on research (first column in Table 8) we can say that the negative impact of the difference between working in a university with no homonymity and being in a univer-

sity with the maximum level of familism is 4.11 percentage points (considering that the values of our AHI go from 0 to 0.58 with a standard deviation of 0.11) on the index which summarize the quality of research (the impact is -0.43 if we consider the standardized index of research).

We observe similar results when looking at the relationship between our index of homonymity and measures of productivity (the impact of the difference here is 4.76 percentage points, 0.45 if we consider standardized index of productivity) and professors' profile. In both regressions in fact the coefficients on AHI are negative, large and highly statistically significant. Our homonymity index is also negative correlated with faculties' score on the international relations criteria although the coefficient is not significant.

Overall, however, familism - as measured by our homonymity index - is associated with poorer academic performance. When considering the global index of academic performance (column 4), the coefficient on AHI is negative and significant (10%) and the impact of the difference between minimum and maximum familism is 1.76 percentage points or 0.26 on the standarzed index. The coefficients on the geographic macro areas dummies in all the regressions confirm the existence of substantial differences in academic performance between North and South of the country.

To further check the validity of our results, we replicate the analysis separately for the research measure, including also discipline and university fixed effects. The qualitative results described above continue to hold providing further support for the view that differences in the strength of family networks may explain part of the

differences in scientific production even among department of the the same university (Table 9). We finally replicate the test using the bibliometric index from CRUI (Table 10). Again, the results remain qualitatively unchanged confirming that familism has a significantly negative impact on scientific productivity and visibility, here the impact of the difference between the two extremes (no familism and maximum level of homonymity) is 0.89 percentage point of the index of productivity and 4.13 percentage points on the index of visibility. (0.32 and 0.39 if we consider the two standardized indexes).

7 Nepotism and social trust, nepotism and family ties

We now examine the relationship between our index of homonymity and civic mindedness. From previous research we know that, in places with lower levels of generalized trust, family ties are generally stronger (Banfield, 1958; Alesina and Giuliano, 2008). In a context of low generalized trust and strong family ties one may expect individuals' propensity to favor relatives in the labor market to be more marked, and hence nepotistic practices to be more widespread.

To test this hypothesis we need a measure of interpersonal trust. Measuring interpersonal trust is by no means an easy task. Several alternative measures have been used in the literature. None of these, however, is without problems. Many researchers have used aggregate indicators to proxy for social trust such as the number of civic and non-profit associations, turnout in elections, etc. Others have

employed measures of self-reported trust and trust-worthiness as assessed by individual responses to standard survey questions. We will use both approaches to test our hypothesis. Following Guiso et al. (2004) we first use the level of blood donation and turnout in referenda at the province level as proxies for generalized trust. Table 11 (column 1 and 2) reports the raw correlation between these variables and the different versions of our AHI (by disciplinary area). The coefficients are not very high, but, as predicted, they are negative and statistically significant at 5% level.

We also use data from the last three rounds of the European Social Survey (ESS)[10]. Our measure of generalized trust is the regional average of individual responses to the following question: "Generally speaking, would you say that most people can be trusted, or that you can't be too careful in dealing with people? Please tell me on a score of 0 to 10, where 0 means you can't be too careful and 10 means that most people can be trusted." ESS data cover all Italian regions; unfortunately data at a more disaggregated level are not available. The last column of Table 11 reports the correlation between the university score in our homonymity index and the average individual score in the ESS trust question in the region where the university is located. Again, the correlation is negative and statistically significant.

To summarize, our preliminary evidence seems to confirm the view that, in areas characterized by low levels of generalized trust, family ties tend to play a more important role, and this also in the

[10]ESS is a bi-annual social survey designed to chart and explain the attitudes, beliefs and behavior patterns of the European population. The ESS data have been extensively used in recent research on social trust (see Alesina and Giuliano 2008, an analogous trust question is included in the General Social Survey (GSS). The GSS data were used for example by Algan and Cahuc, 2007).

context of the university system.

8 Conclusion

In this project we analyze the importance of familism in the Italian Academia, we construct an intuitive measure of homonymity by comparing the relative frequency of a last name in a specific academic unit relative to the overall underlying population. We use the index to investigate the different levels of family connection across universities and discipline and we find that in some disciplines (e.g. medicine) and some universities (e.g. Bari or Messina) practices of nepotism are more widespread than in others. Looking at the correlation between our index and measures of academic performance we also find that universities which score higher in our homonymity measure tend to be characterized by poorer academic performance, especially in terms of research achievement. Finally we also find a strong negative relation between the presence of familism and measurers of local generalized trust.

In order to explore in more details the relationship between civic mindedness and familism in the Italian Academia, we are going to exploit the reform of 1998, which can be used as a natural experiment to understand how the presence of familism changes after the reform. Focus on the reform on 1998, we would like to test the hypothesis that the impact of the reform is "good" in place with high social trust and "bad" in place where the social trust is low and people rely more on their family. Fig 3 shows the quota of blood donation per capita in Italian provinces, if we think that blood do-

nation is a good proxy for the presence of civic mindedness in a province, we can see that in general, in the northern regions are characterized by an higher level of civic mindedness. We divide the provinces according to the level of blood donation per capita, classifying provinces with high civic mindedness those where the level of blood donation per capita is above the median level and province with low civic mindedness the ones where the level of blood donation is below the median. We test our hypothesis trying to understand the impact of the reform in places characterized by high social trust, we estimate the following model:

$$AHI_{jkut} = reform + reform * HSK + size + size_{jut} * reform + \gamma_j + \delta_u + \varepsilon_{jt}$$

Our dependent variable AHI_{jkut} is the homonymity index calculated for twenty years, from 1988 and 2008, k is province in this version of the index, j is the academic unit that in this setting is the disciplinary area in each university u, $reform$ is a dummy which takes value 1 after 1998 and 0 otherwise,HSK is a dummy which indicates provinces with high level of blood donation per capita (higher than the median), $size$ is the number of professors belonging to the disciplinary area j in university u at time t, γ_j and δ_u are respectively area and university fixed effect.

Table 12 shows the results, we can see that the impact of the reform in places with high civic mindedness is negative, so the the decentralization of the recruitment process decreases the the level of familism in place where the level of blood donation is above the median. Fig 4 shows the results when we introduce time fixed ef-

fect, here we plot the the fitted coefficient for the time dummies multiplied by the dummy which indicates high social trust, we can see that there is a negative trend in the presence of familism in the Italian Academia where civic mindedness is high, and the trend in even more negative after the reform.

We plan to use the other measures of generalized trust that we illustrated above and we would also like to see how the presence of familism change with the decentralization in places where there is a high (or low) level of corruption. In particular, we are going to measure corruption with the number of crimes of public embezzlement in the province. In places whit a higher number of crimes against the public offices, social trust is lower and people rely more on their families. We except that in this setting the familism should have increased after the reform of 1998.

9 APPENDIX: Alternative measures of AHI

We here propose an alternative measure of our homonymity index, let us define:

-N_T the total number of professors in the academic unit and

- N_a the of individuals with last name a in the academic unit j

and let $P(n_i = n_l = a)$ be the probability of two individual i and l drawn at random without replacement from academic population D share the same last name, then we have:

$$P(n_i = n_l = a) = N_a(N_a - 1)/N_T(N_T - 1)$$

Then we define the homonymity index on the academic unit j as:

$$I_j = \sum_{a \epsilon S_R} P(n_i = n_l = a) = \sum_{a \epsilon S_R} N_a(N_a - 1)/N_T(N_T - 1)$$

where S_R is the set of surnames repeated more than once in the academic unit j. We now want to compare this index to a similar index in the underlying population. We want then to measure what is the population probability that any two individuals drawn at random share the same last name. Letting a "tilde" denote a population variable we have:

$$\widetilde{I} = \sum_{a \in \widetilde{S}_R} \widetilde{P}(n_i = n_l = a\ ) = \sum_{a \in \widetilde{S}_R} \widetilde{N}_a(\widetilde{N}_a - 1)/\widetilde{N}_T(\widetilde{N}_T - 1)$$

Note that $\widetilde{N}_T$ is the total number of individuals in the area of reference (province, region, commuting circle and secondary campi). Note the difference between $S_R$and $\widetilde{S}_R$: the former is the set of repeated last names in the academic unit, the latter in the actual population.

Finally our index is going to be :

$$I_{jk} = I_j - \widetilde{I}$$

An other version of the index could be the following:

$$I^*_{jk} = I_j - \widetilde{I}^*$$

where

$$\widetilde{I}^{*}_{jK} = \sum_{a \in S_R} \widetilde{P}(n_i = n_l = a\ )$$

and it is calculated in the underlying population but it is the sum of the probabilities that two persons have the same last name, in the subset of last names that appear in the academic unit.

We are still working on those two new versions of the homonymity indexes, so far we can say that the correlation between the $AHIjk$ and I_{jk} is 0.71 and the correlation between $AHIjk$ and I^{*}_{jk} is 0.76, both statistically significant at 0.01. We can reasonable expect that also with the new version of the homonymity index our results will still hold.

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Figures and Tables

Table 1: **Example of Data on Professors**

Name	**University**	**Position**	**Department**	**Disciplinary Area**
ZACCARIA Paola	BARI	FULL	EDUCATION	HUMANITIES
ZACCARO Giovanna	BARI	ASSOCIATE	EDUCATION	HUMANITIES
ZALLONE Alberta	BARI	FULL	MEDICINE	BIOLOGICAL SCIENCES
ZAMBONIN Carlo	BARI	ASSOCIATE	SCIENCES	CHEMICAL SCIENCES
ZAMBONIN Pier Giorgio	BARI	FULL	SCIENCES	CHEMICAL SCIENCES
ZANOTTI Franco	BARI	FULL	MEDICINE	BIOLOGICAL SCIENCES
ZARRILLI Antonia	BARI	ASSOCIATE	VETERINARY	AGRICULTURAL-VETERINARY
ZERLOTIN Miranda	BARI	ASSISTANT	LAW SCHOOL	LAW
ZEZZA Lelio	BARI	FULL	AGRICULTURE	AGRICULTURAL-VETERINARY
ZILLI Carmelo	BARI	FULL	EDUCATION	HUMANITIES
ZITO Giammaria	BARI	FULL	SCIENCES	EARTH SCIENCES
ZIZZA Alfonso	BARI	ASSISTANT	ECONOMICS	POLITICAL AND SOCIAL SCIENCES
ZIZZADORO Claudia	BARI	ASSISTANT	VETERINARY	AGRICULTURAL-VETERINARY
ZIZZO Nicola	BARI	ASSOCIATE	VETERINARY	AGRICULTURAL-VETERINARY

Source: Italian Ministry for University and Research (MIUR)

Table 2: **Data on Distribution of Last Names**

Province	Total population	Last names	Mean occurrences	Max occurrences	Most common
Ancona	350.866	32.669	11	1.490	ROSSI
Aosta	97.955	18.794	5	472	FAVRE
L'Aquila	212.580	19.637	11	895	ROSSI
Bari	942.530	32.400	29	5.771	LORUSSO
Bologna	754.428	69.902	11	3.051	ROSSI
Cagliari	464.976	19.603	24	7.543	MELIS
Campobasso	156.809	12.556	12	832	TESTA
Catanzaro	218.928	13.188	17	1.705	PROCOPIO
Florence	722.605	67.137	11	3.465	ROSSI
Genoa	667.803	72.834	9	5.210	PARODI
Milan	2.834.116	181.971	16	22.689	COLOMBO
Naples	1.509.143	57.905	26	31.591	ESPOSITO
Palermo	668.632	27.446	24	3.224	RUSSO
Perugia	463.916	42.811	11	3.509	ROSSI
Potenza	251.678	13.782	18	1.333	PACE
Rome	2.636.181	160.021	16	11.315	ROSSI
Trento	389.812	41.925	9	1.691	FERRARI
Turin	1.638.080	112.818	15	5.280	FERRERO
Trieste	191.029	35.332	5	500	FURLAN
Venice	606.115	50.862	12	6.505	BOSCOLO
Total	15.778.182	1.083.593			
Country	40.231.516	3.253.396			

Source: Fiscal Census

Table 3: **Localism**

University	Total Faculty	Born Same Province	Born Same Region	Total Pop. Province	Total Pop. Region
PALERMO	2.009	66,4%	87,6%	2,1%	8,6%
NAPLES I	2.947	65,4%	80,8%	5,3%	9,9%
CATANIA	1.588	65,4%	89,0%	1,8%	8,6%
NAPLES II	941	64,4%	82,7%	5,3%	9,9%
BARI (POLYTECH.)	362	63,8%	76,2%	2,7%	7,0%
MESSINA	1.327	63,0%	72,6%	1,1%	8,6%
NAPLES III	210	60,0%	69,0%	5,3%	9,9%
BARI	1.911	57,5%	76,0%	2,7%	7,0%
CAGLIARI	1.124	54,5%	73,8%	1,3%	2,8%
TURIIN	2.104	53,9%	72,6%	3,8%	7,4%
ROME I	4.642	53,4%	57,3%	6,5%	9,0%
GENOA	1.704	53,2%	65,0%	1,5%	2,7%
ROME II	1.373	51,1%	55,2%	6,5%	9,0%
TURIN (POLYTECH.)	836	48,7%	67,0%	3,8%	7,4%
ROME III	830	48,2%	51,3%	6,5%	9,0%
MILAN I	2.402	48,0%	65,6%	6,6%	16,1%
MILANO II	746	46,0%	62,5%	6,6%	16,1%
FLORENCE	2.364	44,4%	63,1%	1,7%	6,2%
TOTAL	59.897	42,6%	61,1%		

Table 4: **Criteria for computing AHI**

	Geographic units				
Academic units	Province	Region	Circle (40 km)	Secondary Campi	Country
University	X	X	X	X	X
Faculty	X	X	X	X	
Department	X	X	X	X	
S.S.D					X
Discipline	X	X	X	X	

Table 5: **AHI- By University**

University	Region	AHI (region)	AHI (prov.)	AHI (circle)	AHI (sec.)
Messina	Sicily	0,300	0,244	0,258	0,244
Catania	Sicily	0,278	0,234	0,252	0,249
Bari	Puglia	0,260	0,258	0,258	0,255
Palermo	Sicily	0,246	0,226	0,228	0,238
Naples II	Campania	0,203	0,191	0,203	0,192
Siena	Toscana	0,140	0,126	0,139	0,131
Sassari	Sardegna	0,139	0,122	0,127	0,127
Naples IV	Campania	0,137	0,000	0,137	0,133
Salento	Puglia	0,134	0,115	0,127	0,127
Rome (Lumsa)	Lazio	0,125	0,124	0,124	0,128
Genoa	Liguria	0,122	0,116	0,116	0,119
Salerno	Campania	0,122	0,105	0,120	0,112
Cagliari	Sardegna	0,121	0,117	0,117	0,115
Rome II	Lazio	0,117	0,117	0,118	0,116
Milan I	Lombardia	0,112	0,111	0,110	0,113
Parma	Emilia-Romagna	0,109	0,087	0,100	0,087
Pavia	Lombardia	0,109	0,082	0,103	0,095
Rome (Biomed)	Lazio	0,109	0,106	0,108	0,106
Casamassima Lum	Puglia	0,107	0,115	0,115	0,115
Turin (Polytechnic)	Piemonte	0,106	0,105	0,103	0,107
Rome I	Lazio	0,102	0,101	0,101	0,102
Bologna	Emilia-Romagna	0,101	0,102	0,103	0,100
Naples III	Campania	0,099	0,098	0,099	0,098
Milan (Cattolica)	Lazio	0,098	0,095	0,099	0,100
Milan (Polytechnic)	Lombardia	0,096	0,093	0,095	0,095
Marche (Polytechnic)	Marche	0,088	0,082	0,085	0,085
Perugia	Umbria	0,083	0,083	0,086	0,083
Pisa	Toscana	0,083	0,071	0,081	0,074

Cont. University	Region	AHI (region)	AHI (prov.)	AHI (circle)	AHI (sec.)
Cassino	Lazio	0,083	0,067	0,077	0,067
Foggia	Puglia	0,083	0,095	0,100	0,095
Florence	Toscana	0,082	0,083	0,083	0,084
Camerino	Lazio	0,082	0,072	0,072	0,070
Rome (LUISS)	Lazio	0,081	0,079	0,080	0,079
Insubria	Lombardia	0,081	0,029	0,080	0,030
Calabria	Calabria	0,080	0,074	0,077	0,074
Modena Reggio Emilia	Emilia-Romagna	0,080	0,067	0,076	0,072
Brescia	Lombardia	0,080	0,077	0,071	0,077
Venice (IUAV)	Veneto	0,079	0,080	0,077	0,083
Verona	Veneto	0,078	0,056	0,080	0,080
Turin	Piemonte	0,077	0,081	0,079	0,078
Reggio Calabria	Calabria	0,075	0,064	0,071	0,064
Tuscia	Lazio	0,070	0,041	0,070	0,070
Bari (Polytechnic)	Puglia	0,069	0,069	0,069	0,071
Bergamo	Lombardia	0,067	0,062	0,065	0,062
Chieti Pescara	Abruzzo	0,063	0,053	0,063	0,065
Padua	Veneto	0,063	0,065	0,062	0,062
Basilicata	Basilicata	0,062	0,058	0,058	0,062
Urbino	Marche	0,059	0,056	0,056	0,056
Naples III	Campania	0,055	0,052	0,055	0,052
Trieste	Trentino-Alto Adige	0,051	0,044	0,051	0,047
L' Aquila	Abruzzo	0,051	0,044	0,041	0,044
Milan (Bocconi)	Lombardia	0,050	0,045	0,048	0,045
Macerata	Marche	0,046	0,048	0,046	0,046
Ferrara	Emilia-Romagna	0,045	0,036	0,047	0,036
Milan (San Raffaele)	Lombardia	0,044	0,050	0,045	0,050
Milan II	Lombardia	0,042	0,044	0,042	0,044
Catanzaro	Calabria	0,038	0,052	0,035	0,052

Cont. University	Region	AHI (region)	AHI (prov.)	AHI (circle)	AHI (sec.)
Rome III	Lazio	0,030	0,029	0,029	0,029
Udine	Friuli-Venezia Giulia	0,029	0,029	0,028	0,028
Venice	Veneto	0,028	0,025	0,026	0,025
Sannio	Campania	0,026	0,000	0,027	0,000
Naples II	Campania	0,024	0,021	0,024	0,021
Piemonte Orientale	Piemonte	0,020	0,018	0,020	0,022
Trento	Trentino-Alto Adige	0,018	0,015	0,021	0,015
Molise	Molise	0,015	0,014	0,014	0,015
Bolzano	Trentino-Alto Adige	0,000	0,000	0,000	0,000
Castellanza Liuc	Lombardia	0,000	0,000	0,000	0,000
Enna Uke	Sicilia	0,000	0,000	0,000	0,000
Milan (IULM)	Lombardia	0,000	0,000	0,000	0,000
Perugia Stranieri	Umbria	0,000	0,000	0,000	0,000
San Pio IV	Lazio	0,000	0,000	0,000	0,000
Teramo	Basilicata	0,000	0,000	0,000	0,000

Table 6: **AHI- by Discipline**

University	AHI (region)	AHI (province)	AHI (circle)	AHI (sec. campi)
MEDICINE	0,1864	0,1994	0,1922	0,1901
VETERINARY MEDICINE	0,1227	0,1446	0,1329	0,1205
AGRICULTURE	0,1037	0,1109	0,1061	0,1077
ENGENEERING	0,1024	0,1154	0,1119	0,1053
ECONOMICS	0,0995	0,1044	0,1034	0,1022
LAW	0,0974	0,1094	0,1089	0,1017
SCIENCES	0,0956	0,1052	0,0992	0,0965
PHARMACY	0,0949	0,1076	0,0992	0,0972
EDUCATION	0,0755	0,0820	0,0759	0,0779
ARCHITECTURE	0,0681	0,0737	0,0708	0,0715
HUMANITIES	0,0640	0,0772	0,0747	0,0719
FOREIGN LANGUAGES	0,0600	0,0732	0,0762	0,0737
POLITICAL SCIENCE	0,0504	0,0533	0,0516	0,0525
STATISTICS	0,0086	0,0083	0,0083	0,0084
PSYCOLOGY	0,0065	0,0064	0,0063	0,0064

Table 7: **AHI- Observed vs.Simulated**

University	Department	Region	Prof	AHI	p-value
Bari	Economics	Apulia	151	0,595	0,000
Messina	Veterinary medicine	Sicily	64	0,495	0,000
Naples	Economics	Campania	144	0,463	0,000
Messina	School of Medicine	Sicily	542	0,458	0,000
Bari	School of Medicine	Apulia	417	0,456	0,000
Messina	Law	Sicily	69	0,447	0,000
Catania	Agriculture	Sicily	124	0,445	0,000
Bari	Law	Apulia	28	0,402	0,002
Bari	Economics II	Apulia	27	0,383	0,004
Palermo	Economics	Sicily	103	0,377	0,000
Rome (Lumsa)	Law	Lazio	21	0,372	0,002
Messina	Education	Sicily	65	0,371	0,001
Naples II	School of Medicine	Campania	546	0,360	0,000
Bari	Law	Apulia	140	0,357	0,000
Catania	Foreign Languages	Sicily	53	0,356	0,003
Sassari	School of Medicine	Sardinia	169	0,354	0,000
Rome (Cattolica)	Sciences	Lazio	24	0,345	0,003
Catania	Economics	Sicily	77	0,322	0,003
Messina	Farmacy	Sicily	50	0,319	0,004
Catania	School of Medicine	Sicily	413	0,319	0,000
Bari	Veterinary medicine	Apulia	84	0,313	0,000
Palermo	Engineering	Sicily	307	0,312	0,000
Bologna	School of Medicine	Emilia-Romagna	510	0,305	0,000
Catania	Architecture	Sicily	37	0,302	0,016
Messina	Sciences	Sicily	224	0,299	0,001
Bari	Sciences II	Apulia	27	0,298	0,010
Naples	School of Medicine	Campania	620	0,293	0,000
Palermo	School of Medicine	Sicily	450	0,292	0,000
Salento	Humanities	Apulia	95	0,284	0,008

Cont. University	Department	Region	Prof	AHI	p-value
Siena	School of Medicine	Tuscany	304	0,280	0,000
Cagliari	School of Medicine	Sardinia	274	0,277	0,015
Bari	Education	Apulia	107	0,274	0,001
Palermo	Sciences	Sicily	280	0,272	0,001
Siena	Law	Tuscany	61	0,264	0,004
Padua	School of Medicine	Veneto	504	0,257	0,000
Salento	Economics	Apulia	68	0,255	0,023
Naples	Law	Campania	195	0,252	0,002
Bologna	Engineering	Emilia-Romagna	346	0,251	0,000
Rome (Cattolica)	School of Medicine	Lazio	737	0,251	0,000
Bologna	Economics II	Emilia-Romagna	47	0,250	0,007
Catania	Law	Sicily	83	0,242	0,029
Palermo	Agriculture	Sicily	132	0,241	0,008
Catania	Farmacy	Sicily	65	0,241	0,032
Macerata	Economics	Marche	32	0,239	0,025
Sassari	Agriculture	Sardinia	85	0,238	0,068
Rome (LUISS)	Law	Lazio	29	0,237	0,009
Casamassima Lum	Law	Apulia	22	0,229	0,046
Sassari	Law	Sardinia	53	0,228	0,085

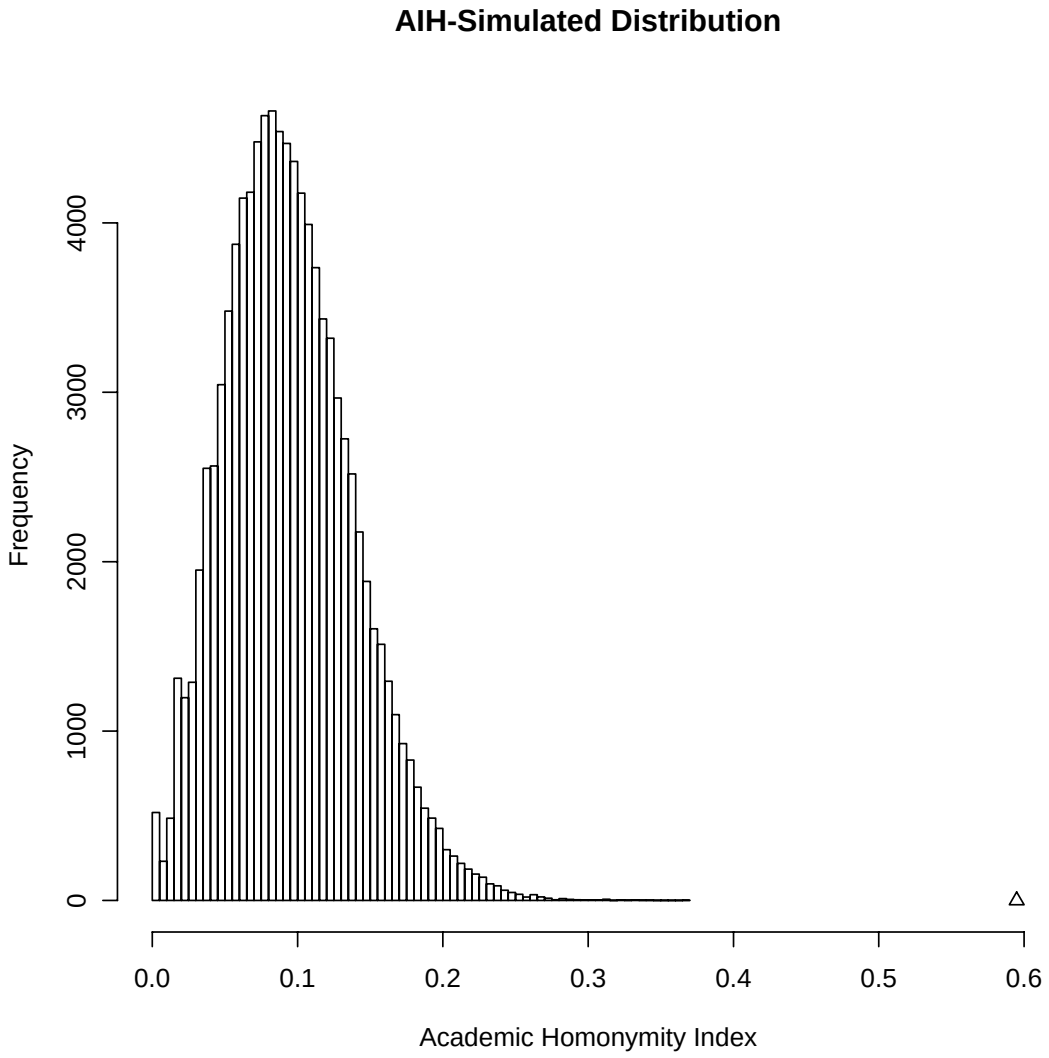

Figure 1: Simulation Bari.

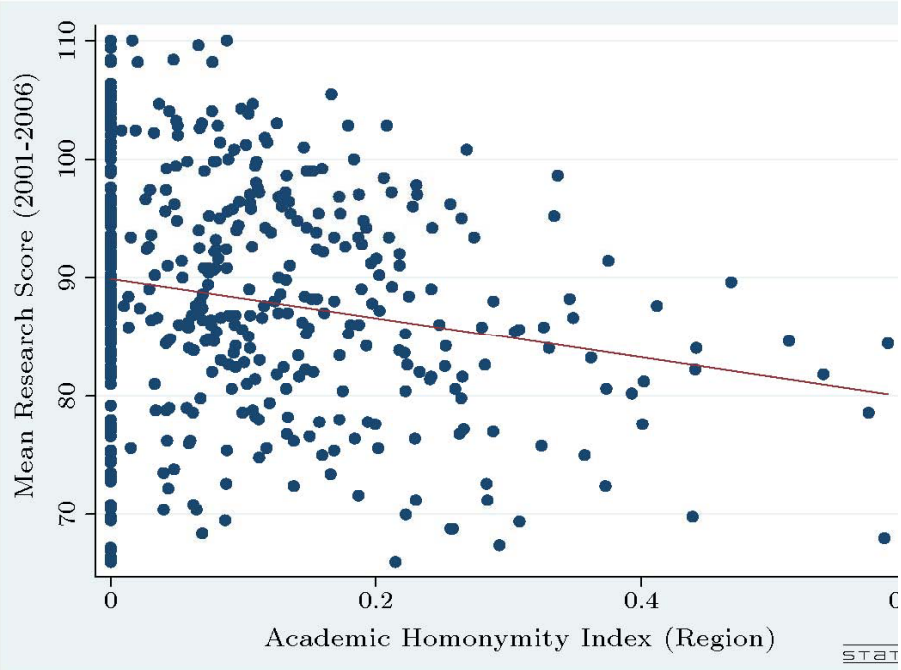

Figure 2: AHI and research

Table 8: **AHI- Nepotism and Academic Performance**

Dependent: Variable	Research	Productivity	Professors' profile	International	Overall
AHI (region)	-6.826*	-8.210***	-15.550***	-1.958	-3.036*
	(3.368)	(3.675)	(3.943)	(3.195)	(1.721)
South	-5.227***	-4.648***	5.993***	-11.470***	-4.873***
	(1.105)	(1.140)	(1.227)	(1.045)	(0.578)
Noth East	1.869*	8.160***	5.090***	4.948***	3.744***
	(1.114)	(1.122)	(1.238)	(1.279)	(0.606)
North West	2.030*	9.166***	4.793***	-1.295	3.799***
	(1.192)	(1.145)	(1.407)	(1.256)	(0.601)
Islands	-7.564***	-8.165***	3.182**	-9.614***	-5.417***
	(1.369)	(1.306)	(1.461)	(1.375)	(0.694)
Constant	90.383***	88.088***	85.966***	85.922***	87.9230***
	(0.820)	(0.857)	(0.920)	(0.969)	(0.469)
Obs	459	457	423	457	457
R-squared	0,169	0,394	0,089	0,355	0,447

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses.
Center is the default geographic area

Table 9: **AHI- Nepotism and Academic Performance**

Dependent Variable: Average Research Performance Score 2001-2006 (CENSIS)				
AHI (region)	-17.566***	-20.825***	-8.523**	-7.121*
	(4.057)	(4.386)	(3.620)	(4.241)
Noth East			2,126	
			(1.639)	
North West			2,15	
			(1.734)	
South			-5.010***	
			(1.524)	
Islands			-7.399***	
			(1.909)	
Constant	90.160***	93.387***	94.017***	71.650***
	(0.827)	(1.578)	(1.727)	(2.839)
Discipline Fixed Effect	No	Yes	Yes	Yes
University Fixed Effect	No	No	No	Yes
Observations	459	459	459	459
R-squared	0,043	0,115	0,231	0,497

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses.
Center is the default geographic area

Table 10: **AHI- Nepotism and Academic Performance**

Dependent Variable: Average Research Performance Score 1995-1999 (CRUI)				
	Productivity	Productivity	Visibility	Visibility
AHI 1998 (region)	-2.043***	-1.534*	-5.142**	-7.129**
	(0.704)	(0.906)	(2.559)	(3.359)
Macro Region FE	Yes	No	Yes	No
Discipline FE	Yes	Yes	Yes	Yes
University FE	No	Yes	No	Yes
Observations	313	311	292	294
R-squared	0,859	0,890	0,858	0,890

*** p<0.01, ** p<0.05, * p<0.1
Robust standard errors in parentheses.
Center is the default geographic area

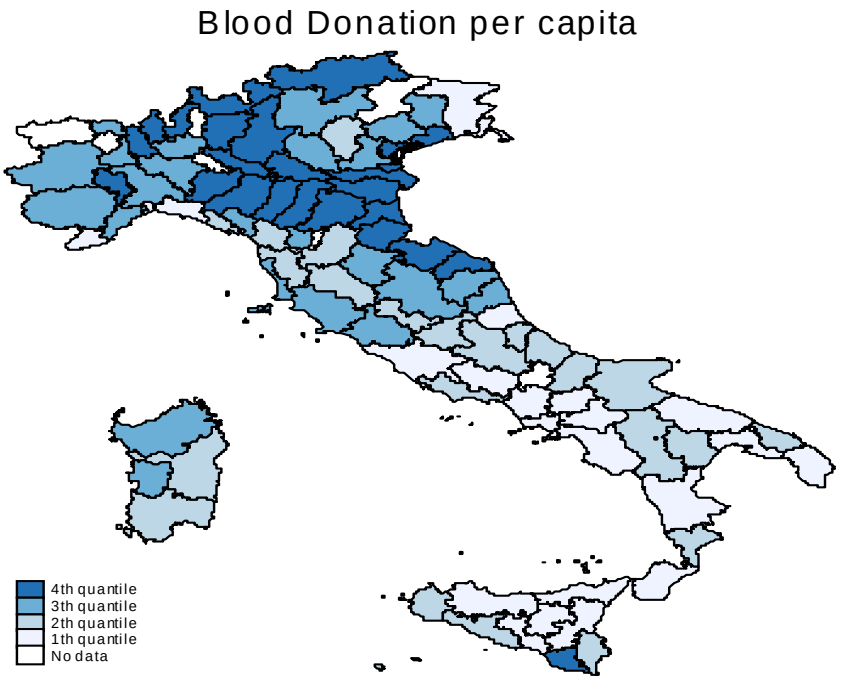

Figure 3: Blood Donation per capita

Table 11: **Correlation AHI-Social trust**

	Social trust indicators		
AHI by departments	Referenda turnout	Blood Donation	ESS Trust Score
Province	-0.2422**	-0.1767**	-0.2141**
Region	-0.2532**	-0.1735**	-0.2033**
Circle (40 km)	-0.2395**	-0.1702**	-0.1945**
Sec. Campi	-0.2498**	-0.1801**	-0.2043**

Table 12: **Reform and high social trust**

	Dep. variables AHI	
Reform	0.018***	0.102***
	(0.004)	(0.085)
Reform*HSK	-0.015***	-0.013***
	(0.003)	(0.005)
Size	0.003***	0.003***
	(0.000)	(0.000)
Reform*Size	0.0004***	0.0004***
	(0.000)	(0.000)
Reform*lngdp_1993		-009
		(0.009)
University FE	yes	yes
Discipline FE	yes	yes
Observations	13062	13062
R-squared	0,5	0,5
*** p<0.01, ** p<0.05, * p<0.1		

Figure 4: Reform and social capital

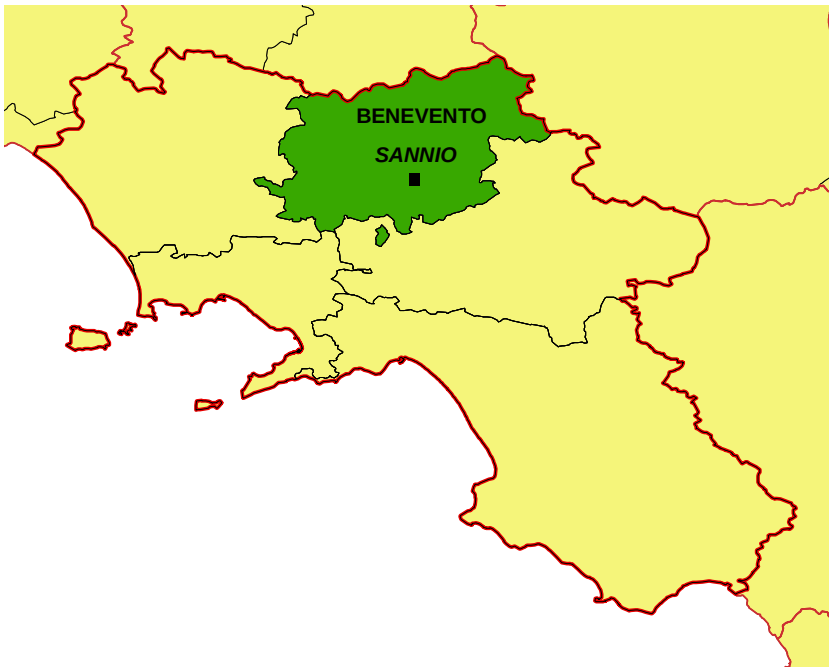

Figure 5: Province

Figure 6: Region

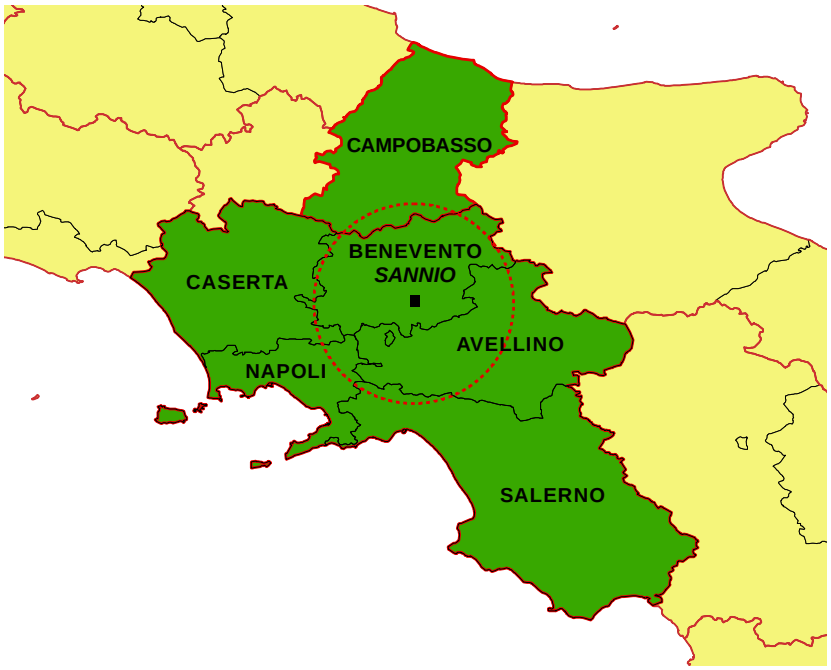

Figure 7: Commuting circle

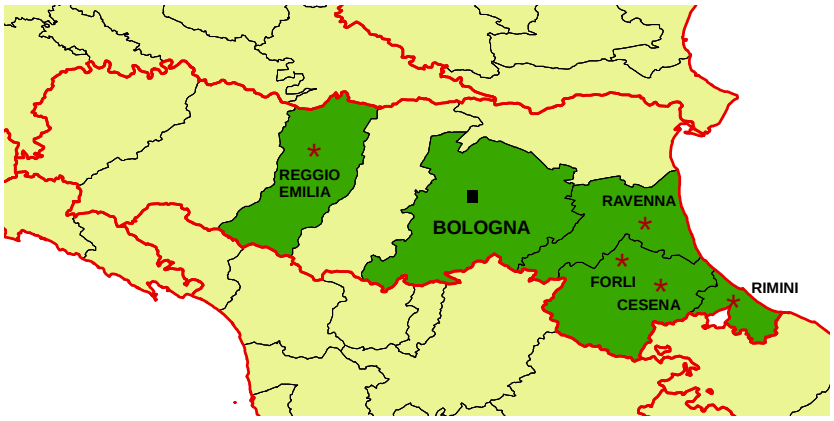

Figure 8: Secondary Campi

CHAPTER 3: Does physical appearance matter? Overweight and labor market discrimination.

Giovanna Labartino *

Abstract

Several studies documents the relationship between physical appearance and labor market outcomes. In this chapter we analyze wether being obese or overweight might have a negative impact on employment status in Italy. Empirical findings, using data from the National Institute of Statistics, show that obesity decreases the probability of being employed for women while the effect is positive for men but not strongly significant. In order to deal with the possible endogeneity problem we instrument the BMI with the exposure to Tv shows where the role of the appearance, especially for women, is crucial and we still find that overweight women face a lower probability of being employed, results for men are not statistically significant.

*Some sections of this chapter will be part of the paper *Does physical appearance matter? Overweight and labor market discrimination* joint with Michela Braga University of Milan, Department of Economics.

1 Introduction

Obesity is a public concern in many developed countries, especially for the direct and indirect costs of the related health problems. On the one hand, direct costs refer to health care providers and services; on the other hand, indirect costs refer to the lost productivity. Considering the trend in the incidence of obesity over the total population, it emerges that obesity is a well established problem in US and a growing problem in Europe (OECD, 2007).

Economic research in this field is mainly focused on the impact of obesity on labor market outcomes. Almost all the existing studies highlight the existence of a strong correlation between obesity or overweight and labor market outcomes in developed countries (Hamermesh and Biddle, 1994, Cawley 2004, Brunello and D'Hombres, 2007) and they conclude that physical appearance do matter in modern labor markets. It also emerges a differential effect between genders: if being obese or overweight has negative impact on employment status and wages for women, the same characteristics do not negatively affect males' labor market outcomes, and in some cases they have even a positive effect. Such results can be rationalized in different ways. First, obesity or overweight have been proved to increase the likelihood of severe diseases both physical and psychological (cancer, diabetes, asthma, hypertension, depression) and, because of these problems, people can be less productive. If it is the case, their return to the labor market would be lower both

in terms of wages and probability to be employed. Second, obese people can be stigmatized and discriminated by employees simply for their aspects because they do not respond to the widespread stereotype of beauty. Third, being overweight could be an individual observable characteristic correlated with some individual unobservable, such as worker's personality traits and ability. Employees can interpret physical aspect as a signal for individual lower productivity, lower self-esteem and no self-control and in imperfect labor markets, where the employer can not control workers' ability due to asymmetric information, it translates in worse labor outcomes.

Most studies in this field are focused on US, where obesity is a less recent phenomenon. Only in recent years there has been an increasing attention on this topic in Europe and some works have been done in a cross-country perspective and considering as natural labor market outcome individual wage. Differently from these studies, in our contribution we test whether physical appearance plays a crucial role in determining individual labor market participation in Italy where no such analysis is available. In addition, our work has a special gender perspective and we investigate if being obese or overweight affects differently men and women. Although the majority of the previous literature has mainly considered the effect of weight on wages claiming that, once entered the labor market, people can experienced a different wage growth rate because of their weight, in our work we test whether obese people have an ex ante different probability to enter the labor market. Using data from a recent household survey conducted by the Italian National Institute of Statistics [1] on nationally representative sample of working age

[1] Indagine Statistica Multiscopo sulle Famiglie. Aspetti della vita quotidiana 2008.

individuals, we examine the incidence of obesity (measured through the Body Mass Index - BMI) on the probability to be employed. We model individual labor market status through a standard model for dichotomous dependent variables, including as regressors traditional explanatory variables (individual specific characteristics, household characteristics, geographic characteristics) and the BMI. However, obesity or overweight is not randomly across individuals, since some unobservable individual characteristics can affect both the probability to bo obese or overweight and the probability to be employed. Arguably factors like self-esteem or self-control are correlated both with body weight and employment status and therefore we have an endogeneity problem. We deal with the potential endogeneity using as an exogenous source of variation for BMI the exposure in the years before the survey to TV shows where the role of the appearance and physical beauty is crucial. The key identification assumption is the following: having been exposed to a specific image of body type influence individual weight without having a direct effect on the probability to be employed. The idea is that the importance of the physical appearance on television could induce people to change their appearance and mainly their weight but it is very unlikely that it influences the individual employment status; in this setting having not contemporary data for employment status and TV shares guarantee the orthogonality assumption to hold. The main contribution of our project to the literature is the use of a new data set containing information on the BMI for exploring, for the first time, its impact on the probability of being employed in Italy. Furthermore we use a new instrument to exploit the influence in TV on BMI.

The chapter is organized as follows. Section 2 presents the previous literature on obesity and on the influence of television on individual behavior. Section 3 gives a description of the data used in the empirical analysis. Section 4 presents the empirical strategy and the results. Section 5 concludes and discusses further possible research.

2 Literature review

This chapter is related mainly to two strands of the literature. The the first one is the literature on the effects of obesity and appearance on economic outcomes, while the second strand is the literature on the effects of media on individual behavior and on social outcomes.

In the first group of contribution, Brunello and d'Hombres (2007) use data from the European Community Household Panel (ECHP) to investigate the impact of individual BMI on wages in nine European countries. They find a negative relationship between BMI and wages in Mediterranean Countries (Spain, Greece, Italy and Portugal) and a positive correlation in the Northern countries (Austria, Ireland, Denmark, Belgium and Finland). They argue that this differential effect can be interpreted as a different reward that people have because of weather and climate conditions prevalent in their place of residence. Being overweight reduces individual productivity in warmer climates but has a positive effect in colder ones. In order to deal with the potential endogeneity problem, the authors instrument the individual BMI using information on the BMI of parents, siblings and children. They argue that their instrument is valid since

it satisfies the two necessary conditions for instrument validity: the BMI of relatives is correlate with the one's of the individual since they share the same family genes but, on the other hand, it satisfies the orthogonality assumption since it is very unlikely that it is correlated to the individual wage. The instrumental variable estimates are consistent with the ordinary leas squares one and show that the BMI affects individual wages irrespective of gender but there are significant differences across countries. In a subsequent work, Brunello et al. (2009) explore the patterns and the trends of obesity across the Atlantic, emphasizing that the crucial driving force for the increase in obesity both in US and in Europe is individual behavior and that the genetic component seems not to be so relevant. The basic result is that obesity affects productivity and that employers tend to pay lower wage to obese or overweight people, in countries where it is easier to discriminate. Following this line of research Atella et al. (2008) focus on wages and use ECHP data. They allow for country heterogeneity by modelling the relation between BMI and wages country by country. Their main contribution is the use of quantile regression models to better understand the difference across countries and wage quantiles. They find that the relationship between obesity and wages is negative and significant all over the distribution for women while it turns out to be significant only for the bottom part of the male distribution. After controlling for the decrease in productivity due to health problems, they still find a negative impact of BMI on wages, suggesting that wage differences can be explained by employer's discrimination. Cawely (2004) looks at the correlation between weight and wages in US with a particu-

lar focus on the gender and ethnic differences. The analysis shows a negative relation for white females that is stable across alternative specifications, that is, OLS with current weight, OLS with lagged weight, fixed effects and IV. He also find a negative relation for black and Hispanic females and for Hispanic males but such result seems to be due only to unobserved heterogeneity and it actually disappears when fixed effects are included. An interesting finding of the paper is that overweight black males tend to earn more than thinner ones. The relationship between BMI and wages is also analyzed by Gregory and Ruhm (2009) through semi-parametric models that allow earnings to vary with BMI. In such a framework it emerges that, for women, the negative effects of weight on earnings is relevant also before the threshold of obesity or even overweight. Instead, the impact is less strong for men. In line with the previous literature, they deal with the endogeneity problem and possible reverse causality using as instrumental variable the BMI of the siblings. Once endogeneity is accounted for the results suggest that it is not obesity but rather other factors - such as physical attractiveness - that can explain the existing relation between BMI and wages. In a recent contribution, Greve (2008) studies the impact of obesity on both employment status and wages in Denmark. Different from previous work she instruments BMI with a variable capturing whether the each individual father or mother have been prescribed medication for genetically determined illnesses or health problems related to obesity. The underlying assumption for the validity of this instrument is that these pathologies are genetically associated with the BMI of the interviewer but they are not correlated with her employ-

ment status. The results show a different effect of BMI on labor outcomes for men and women: on average, obese women are less likely to be employed that healthy weight; while the effect of BMI for men has a U-shaped so that obese men are also less likely to be employed than thinner ones but the effect is less strong.

Economists have also looked to other aspects of the physical appearance, beauty in general, to understand their impact on labor and social outcomes. In their seminal contribution Hamermesh and Biddle (1994) discuss how beauty may be rewarded in the labor market and how it affects the worker occupational choice. To investigate the impact of beauty on labor outcomes they use two surveys (one for Canada and one for US) where the interviewers are asked to rate the respondent physical appearance. Focusing on earnings, they find that good-looking people earn significantly more than average-looking ones who earn more than those who are plain-looking. In a following contribution, Hamermesh and Parker (1995) analyze the impact of beauty on instructional ratings for a group of university teachers. In this University the beauty of the instructors was evaluated by the students: each teacher's picture, in fact, was rated by each of six undergraduate students in a scale from 10 (highest beauty) to 1 (lowest beauty). The paper finding is that instructors who are viewed from the class as better looking receive higher evaluations and that this effect is stronger for men than for women; whether this outcome comes from productivity or discrimination it is very difficult to disentangle. Biddle and Hamermesh (1998) study whether beauty and physical appearance matter in determining labor market outcomes for lawyers. Using longitudinal

data on people graduated from a law school in the US and measuring beauty through matriculation photographs of the students, the authors find that better looking attorneys earn significantly more than others after 5 years of practice and lawyers in private sector are more beautiful than those in public sector. Persico et al. (2004) focus on the variation in the individual's height over time to study how height affects wages in the adult life. The main result of this study is that being relative high during the adolescence increases wages. The proposed channel for this result are social activities: taller kinds participate more on social activities and this might help to accumulate human capital, such as social adaptability, which can translate in a height premium on the job market. Finally, they use their estimation of return to height to evaluate the monetary benefits of a medical treatment for children that increases height.

The second strand of literature is the one that studies the influence of media on individual behavior and social outcomes. This literature is the crucial starting point for our identification assumption when we use the instrumental variable strategy since we assume that there is a strong relation between television and individual physical appearance. Some support for this hypothesis can be found in the economics of media. La Ferrara et al. (2008) estimate the impact of television on fertility choice in Brazil, looking at the exposure to soap operas and novellas where portray families have less children than in the reality. Since Rede Globo is the main novella producer in Brazil, they exploit the timing of entry of this TV network in different areas in Brazil and they find that women living in areas covered by Rede Globo have lower fertility and that the effect is stronger

for less educated women. In a similar framework, La Ferrara and Chong (2008) use the same setting and the entrance of Rede Globo in Brazil to study the impact of television on divorce. In line with the results of their previous paper, they find that the percentage of women who are separated or divorced increases after the introduction of Rede Globo's signal. Gentzkow and Shapiro(2008)study the effect of preschool exposure to television on adolescent cognitive skills exploiting variation in the timing of television's introduction to U.S. cities. Television was not introduced in all the cities at the same time so they can use this variation to identify the effect of television on children tests'score, they find that being exposed to television in preschool age has a positive impact on average adolescent test scores. Finally, Chou et al. (2005) explore the relationship between childhood obesity and fast-food restaurant advertising using data from the Child-Young Adult Longitudinal Survey of Youth for 1979 and 1997. The advertising measure they use is the per week number of hours of television spot for fast food restaurant. Their study shows that a reduction in this kind of advertisements have a positive effect on weight reducing the number of over weight children by 10 percentage points.

With respect to the previous literature our contribution is twofold. First, we explore for the first time the relationship between BMI and employment status in Italy using new data from the National Institute of Statistics; second, we propose a new instrument for BMI based on information on the TV exposure to a particular set of programs characterized by a specific stereotype of beauty and physical aspect.

3 Data

In what follows we briefly describe the different types of data we employ in our empirical analysis. They come from two main sources: the National Institute of Statistics (ISTAT) and Auditel, the institute that provides data on the share of people who watches TV every day.

3.1 Data from Istat

In order to analyze how the probability to be employed is influenced by physical appearance we use as primary data source the survey "Indagine multiscopo, aspetti della vita quotidiana" carried out in 2008 by the Italian National Institute of Statistics. This survey is one of the few italian survey which contains information both on employment status and on physical appearance. In this survey each individual aged at least 18 years old is asked to report her/his height and weight. Using these two information we construct the BMI, that is defined as the weight in kilograms divided by the squared of the height in meters. According to this index and international standards, an individual is severely underweight if her BMI is below 16.5, she is obese of class III if her BMI is over 40. In some way, these category represent outliers and, in line with the previous literature, we exclude from our empirical analysis those people who are pathologically underweight or obese of class III.

From this survey we recover information about individual labor market status and we construct the dependent variable used in our regression analysis that is an indicator which takes value 1 if the individual is employed and 0 otherwise. Table 1 in the appendix

reports the results for a two samples, two-sided test of equality of means for men and women for the crucial variables used in our empirical analysis. The t-test shows that there is a statistically significant difference in the BMI between men and women: on average, females are normal-weight while males are over-weight since their BMI is above 25. When we define employment status by weight category that can proxy individual physical appearance, we observe that the 55 percent of overweight men are employed compared to the 24 percent of women in the same BMI class and this difference is statistically significant. The difference is higher when considering obese workers, only the 19 percent of obese women are employed compared to the 51 percent of obese men in the sample and also in this case the difference is statistically different from zero. This basic descriptive analysis seems to suggest that males are not discriminate in the Italian labor market while, on the other hand, it seems that for women being obese or overweight has a negative impact on the probability of getting a job.

We go further in this preliminary descriptive analysis and in Figure 1 and Figure 2 we plot the probability of employment depending on the BMI, defined on a continuous scale. The graphical analysis suggests that overweight males have a higher probability to be employed but this decreases after a certain threshold. A similar pattern does not emerge for the sub sample of women where instead the relation is always negative and almost linear.

Finally, Table 2 in the appendix shows the summary statistics for the BMI, the employment status and all the controls employed in the empirical analysis. The chosen controls include age, age squared,

the individual's educational levels, the region of residence, the civil status, the number of children younger than fourteen who live in the household and a wealth measure built taking into account the number of durable items that the individual owns. Because of data availability on BMI in the sample only for people aged at least eighteen, we restrict our analysis to working age people from 18 to 64.

3.2 Data of TV shows

In order to build our instrumental variable we use data coming from Auditel[2], which is an independent company that collects data on the number of people watching each TV channel, national or local, minute by minute. In particular, to construct our instrument, we use the TV shares, calculated as the ratio between the number of listeners who are watching a particular TV channel over the total listeners who are watching television in that moment.

Our data on television shares refers to 2001 for two orders of reasons. First, conceptually, we think that current individual BMI could be affected by the image of the body and of the beauty prevailing in a given social context but that, once exposed to a given image, it is necessary a sufficiently long time span to conform to this target. It is quite unlikely that people adapt instantaneously, in few months, their body/weight to the prevailing image. By the contrary, having been exposed to a given image some years ago could have an effect on current weight since people could have adopted a different lifestyle. We believe that seven years is a quite reasonable period

[2] Auditel, Scocietà di rilevazione di dati di ascolto televisivo.

for observing such change.

Second, we choose the TV shows characterized by a particular image of the body according to a study which has been conducted by the Osservatorio of Pavia (a Research center which analyzes the importance on the media in Italy) joint with CNEL (the National council of economics and labor) about the importance on the female image in the Italian television system. This report analyzes several TV shows where the role of the women, in particular of their bodies, is crucial. The study has been conducted on all the shows broadcast in a typical week of 2001, that is from march 11th to march 17th. The typical week is defined as a week in the middle on the TV season, some months after all the programs started, with no crucial media events (national team football match, San Remo music festival etc.) that can create an unusual peak in the share of a particular television channel. Based on this study, we construct our instrument using the same period of reference and the same set of television shows. Based on this study our prior is that people that have been more exposed to a particular image of the body have a lower probability to be overweight and therefore their BMI would be lower.

Table 3 in the appendix presents the shows' titles and their shares divided by sex.

4 Empirical Strategy

The empirical analysis proceeds in two subsequent steps. The first step consists in analyzing the impact of BMI on employment probability, considering alternative specification and focusing on gender

differentials. The second step takes into account the potential endogeneity arising in the basic model for individual BMI and use instrumental variable techniques.

4.1 Ordinary least squares estimation

The aim of the empirical analysis is to investigate whether BMI affects individual employment status. Formally, we model the probability of being employed as follow:

$$Y_i = \beta_0 + \beta_1 BMI_i + \beta_2 X_i + \beta_3 Z_i + \varepsilon_i \quad (1)$$

where the vector Y_i is a binary variable defining individual employment status and assuming value 1 if the individual is employed and 0 otherwise, BMI_i is the body mass index of individual i constructed as described in the data section, X_i is a set of individual characteristics that might influence the employment status (such as age, educational levels, region of residence, civil status and wealth), Z_i are household characteristics which can also impact the dependent variable (such as the number of children less than fourteen who lives in the household of individual i) and finally ε_i is the stochastic error term.

We first estimate a linear multivariate regression on the probability to be employed and a Probit model on the probability of being employed. The main findings are reported in Table 4 where in all the specifications, we have computed robust standard errors. The upper panel of the table shows the estimates of the linear probability model, while the bottom panel shows the estimates of the Probit model and effects are presented via marginal effects.

Also after controlling for individual, household and regional characteristics, the basic results are in line with the descriptive evidence presented in the previous Section. In particular, in the first column, we observe that, in the whole sample, on average, as the BMI increases as the probability to be employed decreases and that females are significantly less likely to be employed than males.

In the all sample we also estimate a model in which we interact the gender dummy with individual BMI. On average we find that for overweight women the probability of employment is significantly lower than for their male peers equally overweight (Column 2). Then, we split the sample by genders in order to estimate the effect of BMI separately for males and females. As shown in Column 3 and Column 4, we still find a negative effect of BMI for women but the impact is now positive and statistically significant for men, suggesting that being overweight or obese increase the probability of being employed for men. In absolute terms the BMI has an higher impact on women than on men.

Passing to the Probit model as presented in the bottom panel of the table, we can observe that the results are very similar to the ones discussed before both in terms of sign and significance level. Allowing for non linear behavior of the estimated relationship, there is statistical evidence that BMI has a negative impact on the employment probability for women, while for men the impact is positive and less significant. When considering the magnitude of the marginal effects we have that BMI have an higher impact on the female sub-sample than on the male sub-sample.

4.2 Instrumental variable estimation

Previous findings indicate that an higher BMI is associated to a lower participation in the labor market but that the effect is different among genders. However, the estimates presented in the previous section could be biased since our variable of interest, the BMI, could be endogenous because of its correlation with unobservable individual characteristics that can affect both individual BMI and the employment status such as self esteem or problem of self-control. Furthermore, we can also have a reverse causality problem: on the one hand individual employment status can depend on physical aspect but, on the other hand, physical appearance can reflect individual employment status and lifestyle. Finally, we can also have a measurement error problem since people, when interviewed, can misreport (unintentionally or intentionally) their weight and height and then the computed BMI is likely to be not the true one. It is straightforward that more than one source of endogeneity could be present in our original specification but, in all these settings, the employment status and the error term could be correlated and therefore our estimates could be biased.

We deal with the endogeneity problem using an instrumental variable approach. In particular we use as exogenous source of variation for individual BMI the share of people of the same sex, the same cohort and the same geographical area who were watching the set of TV shows presented in the data section. In more details, for each specific television show, we have the television shares divided by cohorts (people younger than <8 year old, between 8 and 14, between 20 and 24, 25 to 34, 35 to 44, 45 to 54, 55 to 64 and older than 64),

sex and geographical macro areas (North-East, North-West, Islands, Center and South) and we use those information to instrument the individual BMI.

Our identification assumption is that having been exposed to a particular type of television programs, where the physical appearance is crucial and where there is only one image of the body, can induce people to change their aspect and to adapt to this stereotype but the exposure to these programs have no effect on the current probability of being employed, once all individual observable characteristics are taken into account. If it is the case our instrument turns out to be valid (strongly correlated with the endogenous variable, i.e. the BMI) but it satisfies the orthogonality assumption since it is very unlikely that the TV shares of shows broadcast in 2001 are correlate with the individual probability of being employed in 2008.

We therefore estimate the following instrumental variable model:

$$Y_i = \beta_0 + \beta_1 BMI_i + \beta_2 X_i + \beta_3 Z_i + \varepsilon_i \tag{2}$$

$$BMI_i = \gamma_0 + \gamma_1 Share\_tv_i + \gamma_2 X_i + \gamma_3 Z_i + \mu_i \tag{3}$$

Equation (3) is the first stage for the instrumental variable model and the variable $Share\_tv_i$ have been constructed as the mean of the shares of all the television programs included in our sample and it varies for cohorts, sex and macro geographic areas.

The estimated first stage is presented in Table 5. Reported results are coherent with our prior. In the whole sample, as reported in column (1), the instrument is negatively correlated with the BMI: as the television share increases, as the BMI decreases and this nega-

tive effect is highly significant. Interesting results are obtained when splitting the sample by genders as reported in Column (2) and Column (3). The repeated image of a perfect body through television tends to reduce female BMI while it tends to increase male BMI. We interpret these results in the following way: when women are exposed to the image of other women with a perfect body tend to emulate their peers, while when men are exposed to the image of a single men without a perfect body but surrounded by beautiful women have less incentive to loose weight.

Instrumental variable estimates are presented in Table 6. In the whole sample (Column 1) BMI is negatively correlated with the probability of employment but the impact is much stronger than before. When we consider separately the female and female subsample previous results still hold: overweight women are less likely to be employed while the opposite happens for men. The two effect are statistically different from zero at 99% level for women and at 95% level for men.

Since the sample of television shows used for constructing our instrumental variable might differ for some contents and also for the relative importance of the body imagine, to deal with this aspect, we re-estimate equation (3) using as instrument only those television programs for which physical appearance is unambiguously crucial and somehow measurable. In order to select these programs we first used as a ranking method the type of videos available on the site www.youtube.com, related to the specific programs. Making a search on this web site according to the title of the show and the season in which it was broadcast - i.e. Passaparola 2001-, we ob-

tained all related videos available on the web. We removed from our sample those programs for which the first three videos did not show at least one thin woman and her body. Having obtained this first restricted sample of programs, we then search on the web the home page of each show and we check whether the home page describing the program' content was characterized by the presence of at least one photo of a good-looking woman. Programs that pass both the selection methods are shown in the last two Columns of Table 3. To be sure that in these programs the image of the body, especially for women, was crucial, we also control the qualitative study made by the Osservatorio di Pavia and the dictionary of Italian television [3] which offer a clear description of the shows. These qualitative studies are perfectly in line with our measurable and objective selection method. Figure 3 is a random snapshot of one of the television shows included in our restricted sample (Passaparola - season 2001). This picture visually summarizes the main characters of the show: six beautiful, and almost naked women, with an overweight man. The restricted sample used for constructing the instrumental variable includes programs on this type.

The results for the first stage with the new instrument are showed in Table 7. As in the baseline specification, the instrument is highly correlated with the BMI. However, when we divide the sample by genders the instrument is negatively correlated with female BMI but it turns out to be a weak instrument for men physical appearance. The estimated coefficient in the sub-sample of men is very small in magnitude and not statistically different from zero. This is not surprising and it is in line with our prior: the image of the female

[3] Aldo Grasso (2009) Garzantina della televisione italiana

body is crucial in the Italian television where beautiful and very thin women are over-represented compared to good-looking males. The prevailing image of the body induces women to change their physical appearance in order to look like the model of typical woman represented in television.

Instrumental variable estimates are presented in Table 8. Results obtained in the whole sample, in the female sample and in the male sample seem to suggest that we estimate a local average treatment effect (LATE): the results for all the sample are driven by the effect of females BMI on employment status, while for men physical appearance does not influence the probability of being employed.

We also try to use a different instrument to deal with the potential endogeneity of the BMI, that is a dummy taking value 1 if one of the relatives of the individual is affect by chronic diseases which could be related to obesity. This instrument is almost in line with the previous literature that uses as instrument for individual BMI, the BMI index of relatives because of the genetic component behind the occurrence of obesity. Therefore, we instrument the BMI with the television share and this second instrument. Although non reported in tables, using this specification, the BMI affects negatively the probability of being employed and this effect is in place also for men. This second instrument has the advantage of having more variability, but it is less exogenous since having a relative affected by chronic diseases can influence individual employment status because the ill relative may need specific care and therefore other people in the household are less likely to search for a job.

5 Conclusion

In this chapter we analyzed the relation between the BMI and the employment status in the Italian labor market. In particular we test whether the probability to be employed depends on the individual BMI. Basic ordinary least squares estimates suggest that being obese or overweight decreases the probability of getting a job for women. The potential endogeneity problem arising in this setting is solved by instrumenting the BMI with the exposure to television programs where the role of the physical appearance is crucial. The instrument validity relies on the fact that the importance of the physical appearance on television could induce people to change their appearance and mainly their weight but it is very unlikely that it influences the individual employment status. Taking into account the endogeneity of the BMI we find that the probability of getting a job decreases with the BMI only for women while the results for men and not statistically significant. Our analysis suggests that physical appearance matters in the Italian labor market, especially for women. However, at this stage, it is very difficult to argue if these results can be attributed to employers discrimination or to a lower productivity of overweight people. At a first glance, it would seem that in the case of the Italian labor market we deal with discrimination, since the negative effect of BMI is present only for women. If overweight people were less productive, the same should be true both for men and women, and we should have found a negative coefficient also in the male sub-sample. As further research we would like to build a simple model, following Hamermesh and Biddle (2005), to predict our empirical results.

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Tables and Figures

Table 1: **Two-sided test of equality of means between men and women**

	Men			Women			
Variable	Nr. Obs	Mean	Std. Err.	Nr. Obs	Mean	Std. Err.	p-values
BMI	19213	25,790	0,025	21090	24,118	0,028	0.000***
Employed	23542	0,460	0,003	25319	0,291	0,003	0.000***
Employed if under weight	138	0,362	0,041	1089	0,444	0,015	0.067*
Employed if normal weight	8434	0,586	0,005	12565	0,412	0,004	0.000***
Employed if over weight	8571	0,552	0,005	5553	0,241	0,006	0.000***
Employed if obese	2088	0,515	0,011	1982	0,191	0,009	0.000***

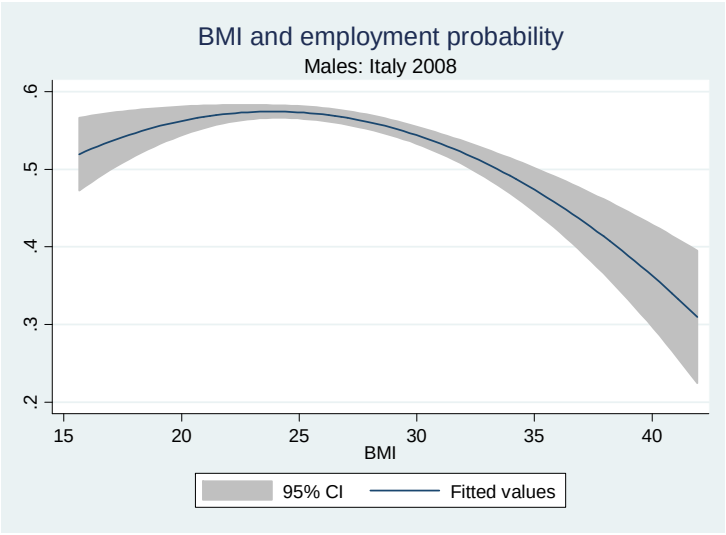

Figure 1: Probability of Employment-Men

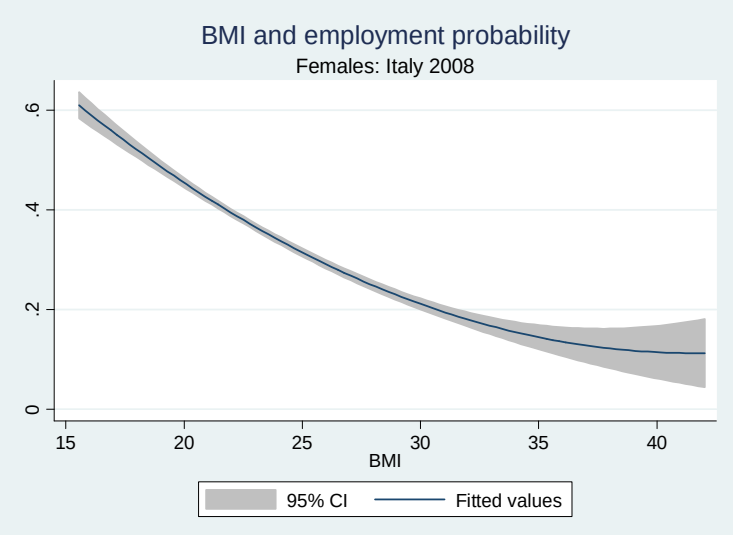

Figure 2: Probability of Employment-Women

Table 2: **Descpriptive Statitistics**

Variable	Obs	Mean	Std. Dev.	Min	Max
Employed	48861	0,372	0,483	0	1
Female	48861	0,518	0,500	0	1
BMI	40303	24,915	3,898	15,556	42,015
Television share	48861	25,336	4,045	16,127	34,563
Age	48861	42,727	22,973	0	103
Age squared	48861	2353,364	2043,875	0	10609
No education	46179	0,100	0,300	0	1
Primary education	46179	0,214	0,410	0	1
Lower Secondary	46179	0,303	0,460	0	1
Professional	46179	0,049	0,216	0	1
Secondary	46179	0,242	0,428	0	1
Tertiary	46179	0,085	0,279	0	1
Post tertiary	46179	0,007	0,081	0	1
Married	48861	0,477	0,499	0	1
Child economically dependent	48861	0,584	0,882	0	6
Wealth index	48861	10,612	4,499	0	22

Table 3: **TV Shares**

Average share in the reference week (Sunday March 11th - Saturday March 17th 2001)				
Program	Men	Women	You tube	Web site
Verissimo	29	71	yes	yes
Uomini e donne	30	70	yes	yes
La vita in diretta	31	69	no	no
Un Pugno o una carezza	34	66	no	no
Dove ti porta il cuore	35	65	no	no
Buona Domenica	36	64	yes	yes
Passaparola	37	63	yes	yes
Domenica in	38	62	no	no
Tempi moderni	40	60	no	no
Matricole	43	57	yes	yes
Sarabanda	44	56	yes	yes
Striscia la notizia	45	55	yes	yes
Quelli che il calcio	53	47	no	no

Table 4: **Employment probability**

Linear Probability model				
	[1]	[2]	[3]	[4]
VARIABLES	All sample	All sample	Females	Males
BMI	-0.00169***	0.00313***	-0.00577***	0.00168*
	[0.000603]	[0.000927]	[0.000771]	[0.000929]
Female	-0.182***	0,0159		
	[0.00422]	[0.0295]		
BMI*Female		-0.00793***		
		[0.00116]		
Observations	39916	39916	20873	19043
R-squared	0,352	0,353	0,302	0,399
Probit model - Marginal Effects				
	[1]	[2]	[3]	[4]
VARIABLES	All sample	All sample	Females	Males
BMI	-0.00225***	0.00569***	-0.00320***	0.00262*
	[0.000795]	[0.00122]	[0.000704]	[0.00157]
Female	-0.254***	0.0741**		
	[0.00555]	[0.0373]		
BMI*Female		-0.0133***		
		[0.00152]		
Observations	39916	39916	20873	19043
Pseudo R squared	0,396	0,398	0,359	0,424
Log pseudolikelihood	-16590	-16550	-8665	-7518

Robust standard errors in brackets
** p<0.01, ** p<0.05, * p<0.1
Controls included: Age, age squared, education
region, civil status, wealth and dependence ratio

Table 5: **First stage Tv-Shares**

Determinants BMI: First stage Instrument: Television share			
	[1]	[2]	[3]
VARIABLES	All sample	Females	Males
Television share	-0.0366***	-0.0438***	0.0281**
	[0.00752]	[0.0103]	[0.0118]
Observations	39916	20873	19043
F-test	23.75	18.05	5.71
Robust standard errors in brackets ** p<0.01, ** p<0.05, * p<0.1 Controls included: Age, age squared, education region, civil status, wealth and dependence ratio			

Table 6: **Employment probability IV**

Employment probability - IV - Linear probability model Instrument: Television share			
	[1]	[2]	[3]
VARIABLES	All sample	Females	Males
BMI	-0.560***	-0.661***	0.633**
	[0.118]	[0.157]	[0.269]
Female	-1.186***		
	[0.213]		
Observations	39916	20873	19043
Centered R squared	-13,432	-22,896	-14,466
Robust standard errors in brackets ** p<0.01, ** p<0.05, * p<0.1 Controls included: Age, age squared, education region, civil status, wealth and dependence ratio			

Figure 3: Snapshot

Table 7: **FIRST STAGE TV SHARES-YT**

Determinants BMI: First stage Instrument: Television share based on you tube			
	[1]	[2]	[3]
VARIABLES	All sample	Females	Males
Television share youtube	-0.027982***	-0.01878***	0.007752
	[0 .003908]	[0.00569]	[0.00602]
Observations	39916	20873	19043
F-test	56.01	12.40	1.78
Robust standard errors in brackets ** p<0.01, ** p<0.05, * p<0.1 Controls included: Age, age squared, education region, civil status, wealth and dependence ratio			

Table 8: **Employment probability IV-YT**

Employment probability - IV - Linear probability model Instrument: Television share you tube			
	[1]	[2]	[3]
VARIABLES	All sample	Females	Males
BMI	-0.169***	-0.578***	0,77
	[0.0290]	[0.167]	[0.580]
Female	-0.482***		
	[0.0525]		
Observations	39916	20873	19043
Centered R-squared	-0,878	-17,381	-21,609
Robust standard errors in brackets ** p<0.01, ** p<0.05, * p<0.1 Controls included: Age, age squared, education region, civil status, wealth and dependence ratio			