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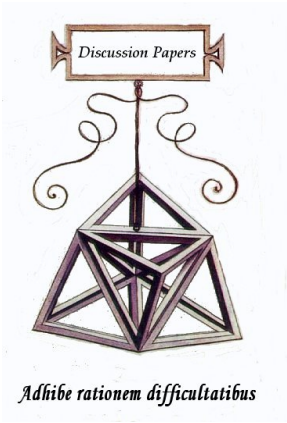

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Regional Commuting in Italy: Do Temporary Contracts Affect the Decision?

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Discussion Paper
n. 203

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Regional Commuting in Italy: Do Temporary Contracts Affect the Decision?

Abstract

In this paper we study how the determinants of regional commuting in Italy have evolved in the past fifteen years. Using labour force data from 1992 to 2008 we estimate a model where the probability of commuting is regressed on a wide set of individual, job, firm and regional characteristics. Specifically, we focus on understanding how the increased flexibility of the labour market in the late nineties/early twenties have affected the individual decision to commute across regions. Consistent with the previous literature, we identify specific types of individual working in firms with well-defined features who are more keen to commute. However, even though temporary employees tend to commute more than permanent employees, the increased utilization of temporary contracts did not have a strong impact on the commuting decisions of Italian workers.

Classificazione JEL: C25, J41, J61, R23
Keywords: Migration, Labour Mobility, Labour Flexibility, Italian regions

Contents

I. Introduction

Italy has always been at the centre of both ingoing and outgoing migration flows. Examples include emigration towards the US in the post unification period, internal emigration from the poor agricultural South towards the richer industrialized North in the after war time, and recently intense immigration flows from Eastern Europe, Africa and Middle East as well as emigration flows towards Europe, Australia and the US. While the decision to migrate represents a micro-economic individual or household decision, most of the literature analyses the push and pull factors (those which influence the movement from the place of origin and to a particular place, respectively) of aggregated migration flows at country level from a macroeconomic perspective. This might be due to the lack of suitable and accurate data from an individual perspective on which to estimate a micro-model. Moreover, most of the data available provide information on migration flows at a country level, while important disparities at a local level may determine internal migration flows within a country, which are often neglected in the literature.[1] To the best of our knowledge only few studies which are dated back in the past analyze the migration decision of individuals from a microeconomic perspective at a regional level. Among those, the majority focus on the role of regional unemployment rate differentials on the decision to migrate from one region to another (Burridge and Gordon, 1981; Pissarides and Wadsworth, 1989; DaVanzo, 1978).

This paper attempts to fill this gap in the literature by focusing on internal labor mobility at regional level from a microeconomic perspective. Specifically, our aim is to understand the determinants behind the decision of individuals to migrate or commute across Italian regions. Our choice is determined by two main factors: first of all, internal mobility in Italy is a rather important phenomenon and second, Italy is considered one of the countries in Europe with larger disparities among regions. Figure 1 compares unemployment rates and regional coefficients of variation among European countries. We can notice that while the Italian unemployment rate is closed to the European average, the Italian regional coefficient of variation is much higher. Particularly in 2001, Italy shows the highest regional coefficient of variation among all European countries. Looking at regional unemployment rates in Italy (Figure 2) we can notice that they ranged from 2.5% to 25% in 1992 and 2001, with remarkable differences between the North and the South of the country. Only in 2008, this range was reduced to approximately 10 percentage points.

Moreover, we are particularly interested in evaluating whether and how changes in the labour market framework and organization may impact the choice of commuting/migrating. We focus on recent labour market reforms (1997, 2001 and

[1] An interesting paper by Bartolucci et al. (2014) uses a panel of administrative data from Italy to study the migration phenomenon from the South to the North of the country and finds that migrants tend to be drawn from the lower-end of the ability distribution.

2003) which have increased flexibility and significantly lowered the employment protection legislation associated with temporary contracts (Figure 3) and therefore might have affected the decisions of workers to commute or migrate from their region of residence. The reasons behind the decision to commute or migrate may include in addition to individual characteristics, efficiency and cost of infrastructure, and local factors such as the unemployment rate and wage structure, also job characteristics such as the type, duration and flexibility of the job. The above-mentioned reforms have profoundly changed those labour market features and therefore might have had an important impact on the decision to commute/migrate. While in this paper, we will concentrate our analysis on the determinants of commuting, in our companion paper (Parenti and Tealdi, 2015) we will address in detail the issue of regional migration.

Commuting rates are in general higher than migration rates and vary across countries. In 2011, commuters accounted for 83% percent of all employed workers in Italy, while commuters across regions accounted for more than 3% of all employed workers. In contrast, internal migrants accounted for less than 1% of all population, on average. There is also evidence that regional commuting rates are growing (ISTAT, 2011). Figure 4 show that while in 1992 the regional commuting rate was approximately 1.5%, it was up to 2.9% in 2001 and 3% in 2008. In addition, we can appreciate important disparities in the migration rates among different regions, which have significantly increased over time (5a). Moreover, the distribution of commuting rates among regions (Figure 5b) shows how the weight of each region in the total national commuting rate has changed over time. Yet it is not clear which factors have driven the growth and the regional variations in commuting. In part, this may be due to the fact that the costs of transport and commuting are perceived to be much lower than the transaction costs and non-economic costs of residential relocation.[2] However, other important factors related to the labour market might have changed the preference of individuals towards commuting, and this is the focus of our investigation in this paper.

In the literature the migration phenomenon and its determinants have been addressed more thoroughly compared to the commuting phenomenon. The only few references we have found on the topic of commuting (Cameron and Muellbauer, 1998; Romani et al., 2003; Huber and Nowotny, 2013; Eliasson et al., 2003) address the decision of commuting together with the decision of migrating, either within a multinomial framework or with simultaneous equations. Cameron and Muellbauer (1998) consider the decision to move (migrate or commute) and the destination choice as part of a unique decision process and focus on labour market variables, specifically relative house prices, relative earnings, relative unemployment rates as determinants of the move.[3] They show evidence of extremely

[2]Improvements in transport infrastructure (in particular, high speed trains) could have also played an important role after 2008.

[3]They define a relative variable as the ratio between the variable in the work region and the variable in the region of residency.

important housing market effects: high relative house prices discourage migration to a region, though expected house price rises, by reducing the user cost of housing, can provide a temporary offset. Romani et al. (2003) analyze both commuting and migration phenomena within the Spanish region of Catalonia for the period 1986-1991. They list as variables that influence both decisions, workers' preferences, family characteristics, professional characteristics and life-cycle stage. Eliasson et al. (2003) examine how individual labour market status and spatial variations in employment opportunities influence interregional job search behaviour and mobility decisions in Sweden. They find that accessibility to job openings in surrounding regions significantly increases the likelihood of choosing commuting as the mobility mode. Moreover, their empirical results indicate that individual unemployment experience increases the likelihood of mobility as well as migration. Finally, by estimating a multinomial probit regression model, Huber and Nowotny (2013) study the willingness to commute and migrate across borders, focusing on the differences in the effects of individual characteristics on migration and commuting propensities. They find that variables measuring the indirect costs of mobility have a smaller impact and gender differences as well as deprivation have a larger impact on the willingness to commute than on the willingness to migrate across borders. The work that most closely resembles ours is the book by Paci et al. (2007). They study the issue of internal labour mobility in Central Europe and the Baltic Region and find that both individual (age, education, marital status, occupation) and regional characteristics (unemployment rate, population density, per capita GDP) are important determinants of commuting. The results are much weaker and contradictory among the eight countries examined when they address the migration phenomenon. In this paper we follow a similar approach, however we focus on regional commuting within Italy rather than focusing on commuting across countries.

A comprehensive analysis of migration/commuting decisions involves the determination of individual/household migration probabilities from each area of origin to all a possible destinations. In the standard random utility model, individuals would compare costs and benefits of residing in each different region and choose the region where the net benefits are the greatest. An alternative would be to build a nested model in which individuals make a sequence of separate decisions, whose outcomes form a decision tree. In this paper, we follow the approach of Molho (1987) and Pissarides and McMaster (1990) and construct a two-stage decision tree, in which the first decision involves the choice whether to migrate/commute while the second decision includes the destination choice. Previous studies (Rossi, 1980; Evers and van der Veen, 1985) have considered separately the decision to move/migrate and the destination choice. Therefore, we perform the analysis of the migrating/commuting decision within the binary response model frameworks, by specifying the probability of moving/commuting as a function of individual and job characteristics as well as features of the region of origin.

We find that individual characteristics such as gender, age, education, and occupation play an important role in the decision of commuting. Specifically, single, male workers with a high level of education employed as high-skill white-collars are more likely to commute. Moreover, important determinants of the decision to commute are job features such as the sector of employment, the flexibility of the job, the length of the contract and the firm's size. Finally, regional characteristics such as relative per capita GDP, relative unemployment rate and relative house prices[4] turn out to have a significant impact on the individual decision to commute. We repeat the same estimation in different years, before and after the implementation of the labour market reforms, and we find that most of the variables considered keep the same sign and significance. Only few job characteristics such as the flexibility of the job and the length of the contract seem to change: the former is not anymore significantly different from zero, while the latter becomes an important factor behind the decision to commute. Overall, we do not find important changes in the structure of the determinants of commuting before and after the reforms. Therefore, we conclude that the labour market reforms which have increased flexibility in Italy did not have a significant impact on the decision to commute.

This paper is organized as follows. Section II. illustrates the institutional background related to the labour market and the major labour market reforms implemented in the last two decades. Section III. describes the data and comments the descriptive statistics. In Section IV. we explain the empirical strategy and in Section V. we show our findings. Section VI. concludes the paper and describes our future research agenda.

II. Institutional background

Open ended contracts associated with quite rigid EPL and high firing costs have represented since 1942 in Italy the traditional legal instrument to hire workers. These contracts are also characterized by the highest wedge between gross salary and labor costs, due to high labour taxes and social security contributions. Since the early 60s, short-term contracts have been regulated. They share the same characteristics as the open-ended contracts, but for the limited duration established at stipulation (up to two years, with only one possibility of renewal). Due to strict rules for adoption, which limited significantly the scope for utilization, their percentage was small until the nineties. Two other types of quasi substitute temporary contracts were available since the 70s: apprenticeship and *Contratto di Formazione Lavoro* (vocational training contract). They were meant to train individuals to learn a profession,[5] and therefore, were specifically

[4]These variables are relative to the average value across regions.

[5]Together they represented less than 10% of the total number of contracts.They differed in the length of the contract and in the training required. The apprenticeship contract was in general longer and demanded more training. Controls for training were much stricter for

designed for young people below the age of 34.

On the wave of liberalization of the European labour markets, in the past two decades many reforms have been approved in Italy to relax the rules for the utilization of temporary contracts and several new types of employment contracts (with fixed duration) have been legislated.[6] The objectives of these interventions, in accordance with the European guidelines, were the reduction of unemployment, particularly among young people, the increase of labor force participation, and the boosting of employment. Indeed, employment, unemployment, and labor force participation in the nineties in Italy were significantly worse compared to other European countries. Young and long term unemployment rates were higher than the EU average (respectively 31% and 70% compared to 16% and 44%),[7] labor force participation and employment were among the lowest in Europe, particularly among women (44% and 36% compared to the average 54% and 49% among the EU countries).[8] In order to promote the utilization of these new forms of employment contracts, new government subsidies were provided to reduce the relative cost of fixed-term contracts (social security fees) compared to open-ended contracts. Moreover, the shorter and flexible length of fixed-term contracts and the possibility to dismiss the worker at expiration at no cost created additional incentives for their adoption by firms. The combination of more flexible and cheaper hiring/firing decisions, and the lower labor cost burden, was the recipe adopted to trigger a more competitive labor market.

Specifically, three were the major reforms implemented with the objectives of improving labor market flexibility. The first reform known as Legge Treu was approved in 1997. It represents a milestone in the history of the recent Italian labor market. Some of the major innovations brought by Law-196/1997 are the regulation of agency contracts and collaboration contracts and the relaxation of the rules for the utilization of temporary contracts and apprenticeships. Few years later, with Law-368/2001, the Italian legal system by implementing a 1999 EU Directive removed the strict rules for adoption of short-term contracts and allowed firms to use short-term contracts under many different circumstances according to organizational, productive and technical needs.[9] The most recent reform took place in 2003 with Law-30/2003. This law, known as Legge Biagi,

apprenticeship and were organized at both national and local levels.

[6]See Tealdi (2011) for an extensive description of these reforms.

[7]Average rate across 19 European countries. 15-24 years old cohort. Unemployment duration longer than 1 year. Year: 1990. Source: OECD.

[8]Average rate across 19 European countries. Year: 1990. Source: OECD.

[9]According to some scholars (Aimo, 2006; Cappellari et al., 2012), the relaxation of these rules and the liberalization of short-term contracts created a sort of confusion among employers regarding the actual requirements for adoption. Specifically, it was not clear whether employers could use short-term contract also for activities which are not of temporary nature. Moreover, in case of court disputes, the applicability relied too much on the interpretations of the judges, causing delays and disincentives for the adoption of the contracts and therefore distorting the objective of the law.

introduced new additional forms of atypical contracts (such as job on call and job sharing) and introduced several modifications to the vocational training contract. However, the main novelty was the relaxation of the rules for the utilization of apprenticeship contracts. Specifically, the age eligibility was extended and the possibility to perform on the job training within the firm (instead of outsourcing it to specific external institutions) was introduced. These changes were made in order to make the apprenticeship contract more appealing for firms and therefore to promote their utilization.

III. Data

We use the European Labour Force Survey (ELFS) data for Italy to identify the determinants of commuting. The ELFS provides individual level data on measures of mobility as well as demographic and socio-economic information. In this paper commuting is defined based on place of work and place of residence being located in two different NUTS2 regions[10] over the period 1992-2008.[11]

For reasons of confidentiality the identification code of the individual/household is not released. Therefore, it is not possible to follow the individuals over time and we can only consider seventeen cross-sections of data from 1992 to 2008. Moreover, it is not possible to pool the cross-sections in consecutive years given the rotation pattern used in the survey.[12]

We do not consider the years after 2008 to avoid confounding effects due to the economic crisis that severely hit Europe (and Italy). We mainly use yearly cross-sections in key years before and after the reforms of the labour market were implemented, i.e., 1992, 2002 and 2008.[13]

[10]The NUTS (Nomenclature of Units for Territorial Statistics) is a geocode standard for referencing the subdivisions of countries for statistical purposes. The standard is developed and regulated by the European Union, and thus only covers the member states of the EU in detail. For each EU member country, a hierarchy of three NUTS levels is established by Eurostat; the subdivisions in some levels do not necessarily correspond to administrative divisions within the country. The NUTS2 level for Italy corresponds to the first-level administrative division of the country (so called "regioni"); in particular there are 20 regions, of which five are constitutionally given a broader amount of autonomy granted by special statutes.

[11]During this period the NUTS2 classification has undertaken many changes. We therefore reallocated all the data according to the NUTS2 classification available in 2008 that provides for Italy 21 NUTS2 regions (i.e., Provincia Autonoma di Trento and Provincia Autonoma di Bolzano are considered separately).

[12]According to the rotation scheme (2-(2)-2) half of the households (four in each enumeration district) stay in the sample for two consecutive quarters. Respondents are interviewed in two consecutive quarters, then they are temporarily removed for the next two quarters and entered again for the following two quarters, thereafter being definitively removed from the survey. When considering yearly data, this implies that the same individuals are interviewed in two consecutive years and, therefore, two consecutive cross-sections are not independent.

[13]For robustness purpose we use also intermediate years, but the results are not significantly different.

We complement this data set with the European Regional Database elaborated by Cambridge Econometrics (CE, 2010) for the years 1992-2008, which contains multiple indicators on European regional growth, convergence and competitiveness. Specifically, it provides information on economic output, employment, population, GDP, compensation, gross fixed capital formation and other NUTS2/NUTS3 sub-state data observations. Finally, we use the house prices index provided by the Bank of Italy (Muzzicato et al., 2008).[14]

Only employed workers are included in our data set, since we restrict our analysis to those individuals who commute for working reasons.

III.A. Descriptive statistics

In this paper, we follow the approach of Molho (1987) and Pissarides and McMaster (1990) and separate the decision to move/migrate and the destination choice, since the former decision includes the evaluation of an activity (migrate/commute) among a set of alternative activities, while the second one determines a destination choice among a set of competitive destinations.[15] We therefore focus on the push factors that provide incentives to people to commute, taking into account their different propensities to commute due to personal characteristics.

Our 1992 sample includes 59345 individuals, among whom 1.6% are regional commuters (Table 1). They belong to the working age population (16-64 years old) and they are employed, i.e., they commute for working reasons. More than half of the individuals are married males and the great majority hold a primary level of education. Most of them are either born or resident in Italy for more than ten years. With respect to their jobs, more than two thirds are employees and more than 90% work full-time. The percentage of those who are hired on a temporary job is small (approximately 4%) and most of them never work from home. Given the structure of the Italian industry, it is not surprising to see that most of the sampled individuals work in firms with less than ten employees. We can also notice that more man and single individuals commute. Commuters are on average younger than non-commuters, they hold an higher level of education and tend to live in less urbanized areas. Moreover, commuters tend to work as high-skill white collars in larger firms.

Our 2002 sample includes 58287 individuals, among whom a higher percentage are regional commuters (3%), as shown in Table 2. The characteristics of this sample of individuals are fairly similar to the 1992 sample and commuters share similar distinctive features. However, in 2002 more individuals hold a secondary or tertiary level of education, a bigger share is hired on a temporary job, particu-

[14]The data on the house prices index refer to the 20 Italian regions. We therefore assign the index value of Trentino Alto-Adige to both Provincia Autonoma di Trento and Provincia Autonoma di Bolzano.

[15]More details are provided in Section IV..

larly among commuters (4% in 1992 versus 10% in 2002), and they tend to work in larger firms.[16]

Our 2008 sample includes 55543 individuals, among whom 3.2% are regional commuters (Table 3). Their level of education has shifted towards the top, particularly among commuters (20% in 2002 versus 26% in 2008 held a tertiary level of education). Moreover, more and more individuals hold a temporary working position (10% of commuters and 17% of non-commuters). The distribution of workers across firm size has partially shifted back to small size companies, however commuters still tend to work in larger firms.

IV. Empirical strategy

A comprehensive analysis of migration/commuting decisions involves the determination of individual/household migration probabilities from each area of origin to all a possible destinations. In the standard random utility model, individuals would compare costs and benefits of residing in each different region and choose the region where the net benefits are the greatest. There are however several issues associated with this approach. First of all, the number of destination areas might be very large making this computation unfeasible. Second, it may also be unrealistic to assume that this reflects the behavior of individuals, particularly whenever the cost of information is positive and different from zero. One possible solution to this problem is to build a nested model in which individuals make a sequence of separate decisions, whose outcomes form a decision tree. In this paper, we follow the approach of Molho (1987) and Pissarides and McMaster (1990) and construct a two-stage decision tree, in which the first decision involves the choice whether to commute while the second decision includes the destination choice. Previous studies (Rossi, 1980; Evers and van der Veen, 1985) have considered separately the decision to move/migrate and the destination choice, arguing that the former decision comprises the evaluation of an activity (in our case, commuting) among a set of alternative activities. The latter instead offers as an outcome a destination choice as the result of a comparison between multiple competitive destinations. Therefore, the analysis of the commuting decision may be cast in the standard binary logit framework, by specifying the probability of commuting as a function of individual and job characteristics as well as features of the region of origin. The second decision includes instead important spatial factors, which are ignored in the first step. While at first glance a multinomial model seems to be the right modeling choice for the second decision, it may actually not be the case since the dependent variable may be seen to take on a strict

[16] We can observe a structural change in the distribution of workers among firms with different sizes. Two important phenomena might have affected this change: the adoption of the ECU (European Currency Unit) as the unit of account of the European Community in 1999 and the crash of the dot-com bubble in 2000-2001. However, the analysis of this break is outside the scope of this paper.

ordered hierarchy (short, medium and long distance) violating the assumption of equal substitutability across alternatives underneath the multinomial logit model, in the form of the independence of irrelevant alternatives axiom (Molho, 1987).

The ELFS provides a wide choice of relevant variables for the decision to commute and general specifications were therefore examined using ordinary least squares (OLS) estimates of a simple linear probability model. This approach was chosen since it is known that in the presence of heteroskedasticity (as in our case), OLS estimates of a linear probability model (LPM) are unbiased and consistent, even though inefficient (the standard errors are inconsistent estimators of the true standard deviations), while the probit or logit (Q-) maximum likelihood estimates are biased and inconsistent (Greene, 2011). Aside from the issue of fitted values being outside the unit interval, "if the main purpose of estimating the binary response model is to approximate the partial effects of the explanatory variables, averaged across their distribution, then the LPM often does a very good job" (Wooldridge, 2010, p. 563). Given that our aim is to approximate the average partial effects of the explanatory variables, we estimate a LPM and report heteroskedasticity-consistent standard errors. As a robustness check we compare the LPM estimates with the Average Partial Effects (APEs) of logit and probit estimations.[17] The APEs are calculated as in (Wooldridge, 2010, p. 577) and their standard errors are estimated through a bootstrap procedure (see Section A).

Both logit and probit estimates did not differ substantially from those obtained using the LPM, in terms of sign and significance of the variables.[18] Therefore, we can state with some confidence that our estimates are unbiased and consistent and the standard errors are also consistent estimators of the true standard deviations. In the interpretation of the results it is important to bear in mind that they relate only to whether the individual decides to commute or not and not to the type of move he/she might undertake.[19]

V. Findings

The main results for the determinants of commuting in 1992 are shown in Table 4.[20] Our regression suggests that individual characteristics are important factors determining the decision to commute. Specifically, gender and marital status play an important role: female employed workers are significantly less in-

[17]Usually the estimates from a LPM estimation are more comparable to the APEs derived from a logit or probit estimate as pointed by Wooldridge (2010).

[18]Both logit and probit estimates for 2008 are reported in Table 5.

[19]All the calculations are made in R (R Development Core Team, 2012).

[20]The reference category includes individuals with the following characteristics: married males, aged between 50 and 64, holding a secondary education level, resident in the country for more than 10 years, self-employed in the construction sector as low skilled blue collars, living in an hypothetical region in the Center of Italy where the value of the relevant regional variables equals the average among regions.

clined to commute compared to males, while single workers are more likely to commute compared to married workers. Age is also an important determinant: younger workers (below the age of 34) are less willing to commute compared to older workers, as in Romani et al. (2003). We interpret this result thinking that younger workers are probably more mobile and therefore more likely to migrate whenever they find a job in a different region, while older workers who have already established links in a certain region prefer to commute rather than changing their residency. This interpretation is confirmed by the results presented in our companion paper on the determinants of migration (Parenti and Tealdi, 2015), which show a positive and significant sign for young workers belonging to the same age classes. Our regression also shows that education plays an important role. Highly educated workers (holding at least a tertiary degree) are more likely to commute while low educated workers (below upper secondary level) are less likely to commute compared to workers with a medium level of education (upper secondary education), in line with the findings of Romani et al. (2003).[21] Finally, living in a thinly populated area rather than in a densely populated area is associated with higher likelihood of commuting.

Job characteristics are also important factors determining the decision to commute. Employees commute more compared to self-employed workers. High-skilled white collars are significantly more likely to commute compared to low-skilled blue collars, while high-skilled blue collars are less likely to commute compared to low-skilled blue collars. Some sectors are also associated with higher rates of commuting: in particular, workers in constructions commute more compared to workers in any other sector (including agriculture, mining, manufacturing, finance, public sector), in line with the results of Paci et al. (2007). As expected, working full-time increases the probability to commute, as well as holding a job with some degree of flexibility (flexible working hours). Holding a temporary versus a permanent job does not affect significantly the worker's decision to commute. This can be explained by the low share of temporary contracts used back in the early 1990's, when temporary contracts were strictly regulated and the prevalent form of employment contract was the open-ended. However, the longer is the job tenure, the lower is the probability to commute. Finally, the size of the firm negatively affects the commuting decision of the worker: employees of smaller firms are less likely to commute. Similar results are obtained by Paci et al. (2007) who explain this phenomenon in terms of the ability of larger firms to recruit from a larger territory. Moreover, they refer to the possibility that larger firms may afford to subsidize more commuting compared to smaller firms.

Finally, we analyze the roles of the characteristics of the region of residence (push factors). We compute per each variable the relative value compared to the average among regions. We control for per capita GDP, which turns out to have a negative impact on the probability of commuting. If a worker lives in a

[21] We follow the Eurostat classification of high, medium and low educational levels according to the ISCED, International Standard Classification of Education.

region with a relatively higher GDP per capita, he/she is less likely to commute to another region. That is, higher GDP per capita discourages commuting outflows, while encourages commuting inflows. The relative unemployment rate is not significantly affecting the decision to commute, while the relative house pricing shows a negative sign. As pointed out by Cameron and Muellbauer (1998) one should expect the relative house prices to have the opposite effect on regional commuting compared with regional migration. Indeed, if the price of houses is high in the region of residence, the worker prefers to migrate than to commute. This result is confirmed by the positive sign of this variable when analyzing the migration decision, as shown in our companion paper (Parenti and Tealdi, 2015). Finally, we introduce dummies for geographical macro-regions, such as North-West, North-East, Center, South and Islands to control for important historical, cultural, and economical differences.[22] As expected, the probability of commuting is lower in the Islands and in the South of Italy.

These results are robust to different specifications and to different econometric approaches (logic and probit estimations). Please see Table 5 for further details.

We are now interested in understanding whether the labour market changes registered in Italy in the past twenty years affected the workers' decision to commute. In particular, we want to focus on changes in job characteristics that may have affected these preferences. As described in detail in Section II., the main labour market reforms happened in 1997, 2001 and 2003. Therefore, we repeat the same estimation in critical years, i.e., after the implementation of the reforms. The results are robust across time. Here we comment on the 2008 estimation, after all the reforms have been implemented; however, all the estimation results in intermediate years are presented in Table 4.

All individual and job characteristics which had a significant impact on the probability to commute before the reforms are still significant and keep the same sign after the reforms, with only few exceptions. Regarding individual characteristics, low levels of education are not anymore a significant factor, while high levels of educations are still an important determinant of commuting. Moreover, being a resident in the country for less than ten years significantly lowers the probability to commute, compared to those workers who are born in the country or have been living in the country for more than ten years. We interpret this result thinking of the lower propensity to migrate of those people who have been living in Italy for a long time.

Regarding job characteristics, holding a temporary job with duration shorter than one year is associated with a positive probability to commute. We link this result to the fact that the share of temporary contracts shorter than one year is

[22]Differences among macro regions are especially pronounced in Italy, particularly between wealthy Centre-North and the less developed South. These two areas of the country have been persistently characterized by two different types of social integration and economic development, so much so that the Centre-North and South of Italy can be viewed as two distinct countries (Mingione, 1993).

in 2008 much higher than in 1992 and this may have an important impact on the decision of workers to commute. Having a job which provides some degree of (working hours) flexibility does not have anymore a significant impact, while having a second job has a negative effect on the probability to commute. Finally, the relative unemployment rate is significantly and negatively affecting the decision to commute in 2008, which we explain thinking that workers would prefer to migrate from regions with high level of unemployment. This interpretation is confirmed by the positive and significant value obtained for the relative unemployment variable when analyzing the probability to migrate from one region to another (Parenti and Tealdi, 2015). Overall, our findings seem to show that the labour market reforms which introduced flexibility in the labor market in Italy did not have a major impact on the decision of workers to commute.

VI. Conclusions

In this paper we study how the determinants of regional commuting in Italy have evolved in the past fifteen years. We use labour force data from 1992 to 2008 to estimate a model where the probability of commuting is regressed on a wide set of individual, job, firm and regional characteristics. We are particularly interested in understanding how the reforms aiming at increasing the flexibility of the Italian labour market in the late nineties/early twenties have affected the individual decision to commute across regions. In the literature there are no papers which study this phenomenon which we believe it is important to be addressed for many reasons. First, several crucial labour market reforms were approved in order to increase the flexibility of the labour market through the introduction of new types of temporary contracts as well as the relaxation of the rules associated with existing temporary contracts. By changing the structure of the labour market, these reforms may have had a strong impact on the mobility of Italian workers. Second, the commuting rate among Italian workers is quite high and has increased significantly since the early nineties. Third, Italy is known as a country with remarkable internal disparities both at macro-regional (North versus South) as well as at regional level and these imbalances may severely affect the decision of individuals to commute for working purposes.

By estimating a linear probability model, we are able to identify a commuter type: a male single worker in his fifties (or older) with a tertiary level of education who have been living in Italy for a long time in a thinly urbanized area. He is a high skilled white-collar either self-employed or employed in a large firm in the construction sector. He lives in the North-West of Italy in a region with relatively high per capita GDP and low unemployment rate. When we repeat the same estimation in years after the implementation of the labour market reforms, we find that a worker employed on a temporary contract rather than a permanent one is more likely to commute; however the increased utilization of temporary contracts did not radically change the decision process of Italian workers in terms

of commuting. Several steps fill our future research agenda, the first of which is to extend this study by looking at the second phase of the commuting decision: the destination region.

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References

Aimo, M. (2006). Il contratto a termine alla prova. *Lavoro e diritto* (2-3/2006).

Bartolucci, C., C. Villosio, and M. Wagner (2014). Who migrates and why? evidence from italian administrative data.

Burridge, P. and I. Gordon (1981, July). Unemployment in the british metropolitan labour areas. *Oxford Economic Papers 33*(2), 274–297.

Cameron, G. and J. Muellbauer (1998, August). The housing market and regional commuting and migration choices. CEPR Discussion Paper 1945, C.E.P.R. Discussion Papers.

Cappellari, L., C. Dell'Aringa, and M. Leonardi (2012). Temporary employment, job flows and productivity: A tale of two reforms. *The Economic Journal 122*(562), F188–F215.

CE (2010). *Cambridge Econometrics*. Cambridge.

DaVanzo, J. (1978, November). Does unemployment affect migration? evidence from micro data. *The Review of Economics and Statistics 60*(4), 504–514.

Eliasson, K., U. Lindgren, and O. Westerlund (2003, November). Geographical labour mobility: Migration or commuting? *Regional Studies 37*(8), 827–837.

Evers, G. H. and A. van der Veen (1985, June). A simultaneous non-linear model for labour migration and commuting. *Regional Studies 19*(3), 217–229.

Greene, W. H. (2011, February). *Econometric Analysis* (7 edition ed.). Boston: Prentice Hall.

Huber, P. and K. Nowotny (2013, October). Moving across borders: Who is willing to migrate or to commute? *Regional Studies 47*(9), 1462–1481.

Mingione, E. (1993). Italy: the resurgence of regionalism. *International Affairs (Royal Institute of International Affairs 1944-)*, 305–318.

Molho, I. (1987, February). The migration decisions of young men in great britain. *Applied Economics 19*(2), 221–243.

Muzzicato, S., R. Sabbatini, and F. Zollino (2008). Prices of residential property in italy: constructing a new indicator. Questioni di Economia e Finanza (Occasional Papers) 17, Bank of Italy, Economic Research and International Relations Area.

Paci, P., M. Tiongson, Erwin R.and Walewski, J. Liwinski, and M. M. Stoilkova (2007, January). *Internal Labor Mobility in Central Europe and the Baltic Region*. World Bank Publications.

Parenti, A. and C. Tealdi (2015). Regional migration in italy: Do temporary contracts affect the decision?

Pissarides, C. A. and I. McMaster (1990). Regional migration, wages and unemployment: Empirical evidence and implications for policy. *Oxford Economic Papers 42*(4), 812–31.

Pissarides, C. A. and J. Wadsworth (1989). Unemployment and the inter-regional mobility of labour. *Economic Journal 99*(397), 739–55.

R Development Core Team (2012). *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. ISBN 3-900051-07-0.

Romani, J., J. Surinach, and M. Artis (2003, November). Are commuting and residential mobility decisions simultaneous? the case of catalonia, spain. *Regional Studies 37*(8), 813–826.

Rossi, P. H. (1980, March). *Why Families Move* (2nd edition ed.). Beverly Hills: SAGE Publications, Inc.

Tealdi, C. (2011). Typical and atypical employment contracts: the case of italy. MPRA Paper 39456, University Library of Munich, Germany.

Wooldridge, J. M. (2010). *Econometric Analysis of Cross Section and Panel Data*. MIT press.

A Robustness Checks

As a robustness check we compare the LPM estimates with the Average Partial Effects (APEs) of logit and probit estimations. For shortness sake we only report the results for the cross-section in 2008 in Table 5.[23] In order to derived the standard errors of the APEs we use the following bootstrap procedure.

Given the observed sample of observations $Z = (y_i, \mathbf{x}_i)$ for $i = 1, ..., N$ the bootstrap procedure consists of five steps.

1. Generate B independent bootstrap samples $Z^1, ..., Z^B$ in two steps:

   (a) draw with replacement N integers from the cross-sectional units (i.e. individuals) $i = 1, ..., N$;

   (b) construct the bootstrap sample $Z^b = \left(y^b, \mathbf{x}^b\right)$.

2. Estimate the model for each $Z^1, ..., Z^B$ and take the estimated parameters $\hat{\beta}_k$ with $k = 1, ..., K$.

3. Compute for each bootstrap sample, $b = 1, ..., B$, and for each explanatory variable, $k = 1, ..., K$, the average partial effect APE_k^b as:

$$APE_k^b = \hat{\beta}_k \left[N^{-1} \sum_{i=1}^{N} g(\mathbf{x}_i \hat{\beta}) \right] \text{ when } x_k \text{ is continuous}$$

or

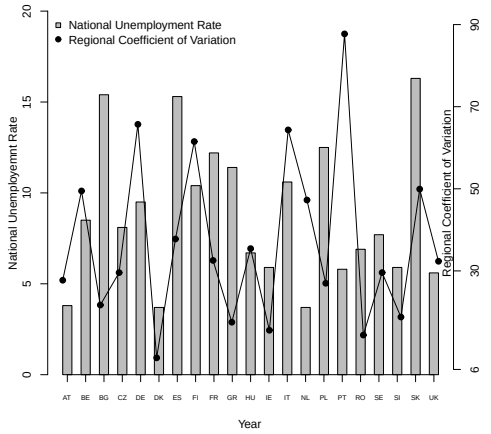
$$\begin{aligned} APE_k^b &= N^{-1} \sum_{i=1}^{N} [G(\hat{\beta}_1 + \hat{\beta}_2 x_{i2} + ... + \hat{\beta}_{K-1} x_{i,K-1} + \hat{\beta}_K) + \\ &- G(\hat{\beta}_1 + \hat{\beta}_2 x_{i2} + ... + \hat{\beta}_{K-1} x_{i,K-1})] \\ &\text{when } x_k \text{ is binary.} \end{aligned}$$

4. Compute the the two-side p-value:

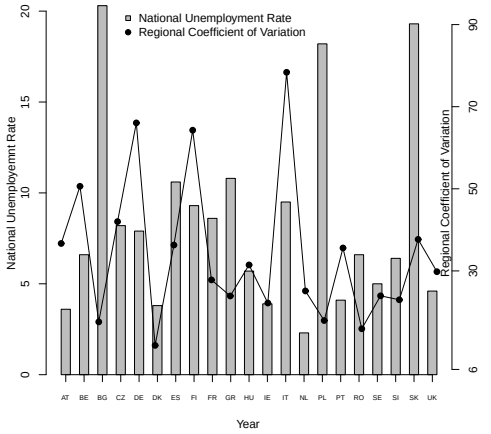
$$P_k^B = 2 \times \min \left(\sum_{b=1}^{B} \{APE_k^b \leq 0\}, \sum_{b=1}^{B} \{APE_k^b > 0\} \right) / B. \tag{1}$$

In our estimates we set $B = 500$.

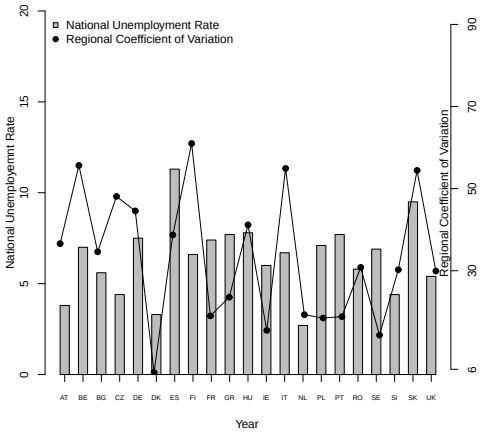
[23] Results for other years are available upon request.



(a) 1992

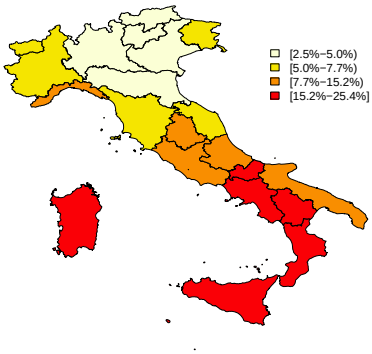


(b) 2001

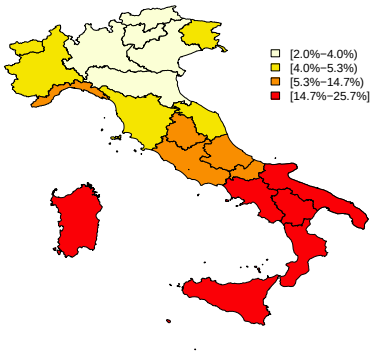


(c) 2008

Figure 1: Italy - National unemployment rate and regional coefficient of variation.



(a) 1992



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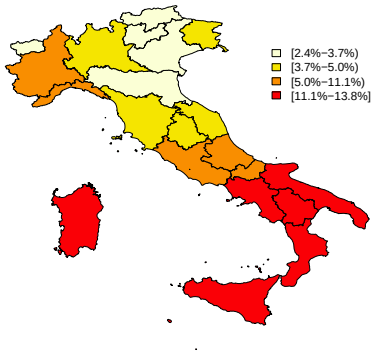


(c) 2008

Figure 2: Italy - Regional unemployment rates.

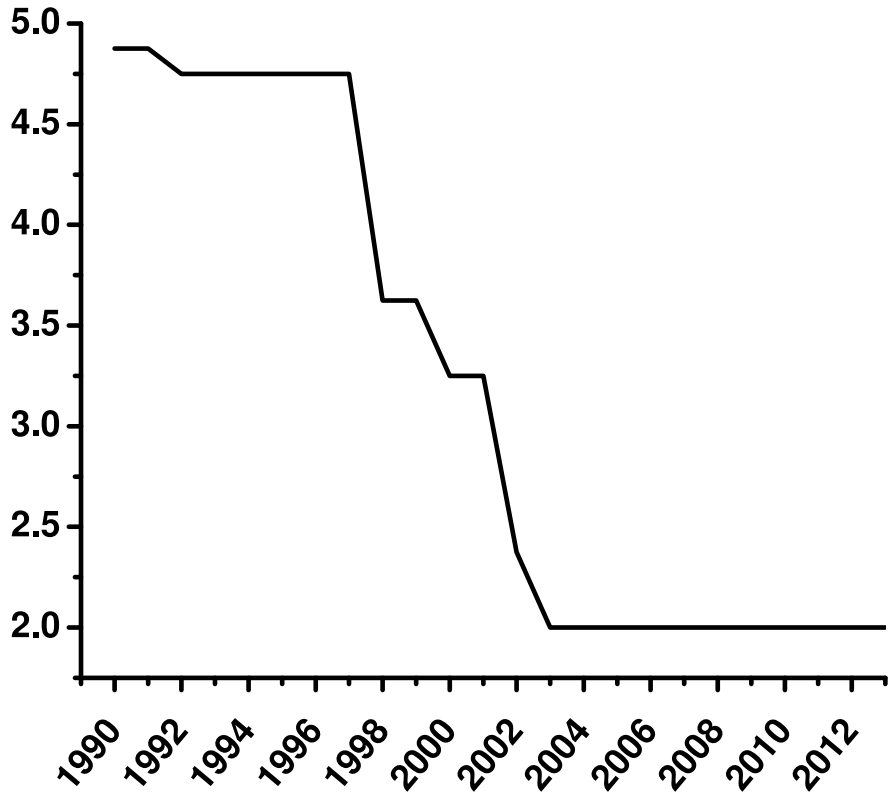


Figure 3: Italy - Employment protection legislation (EPL) index for temporary contracts. Source: OECD.

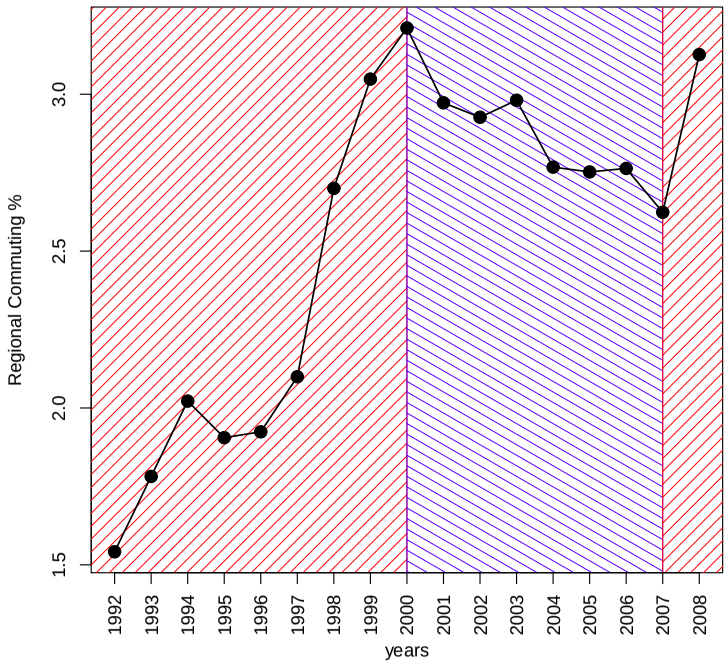
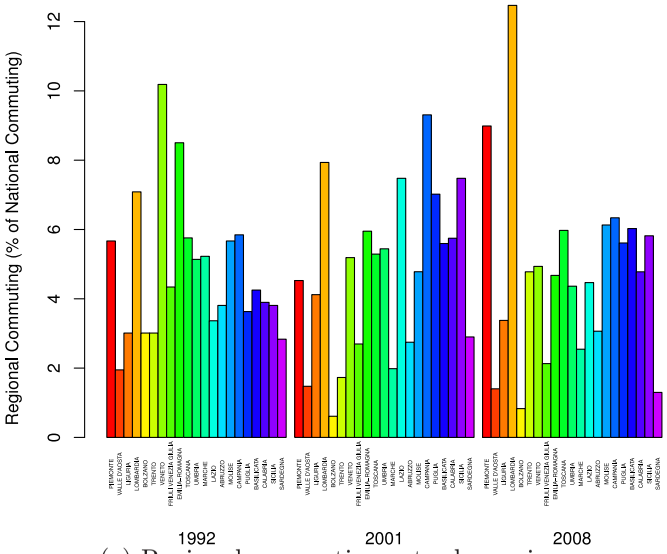
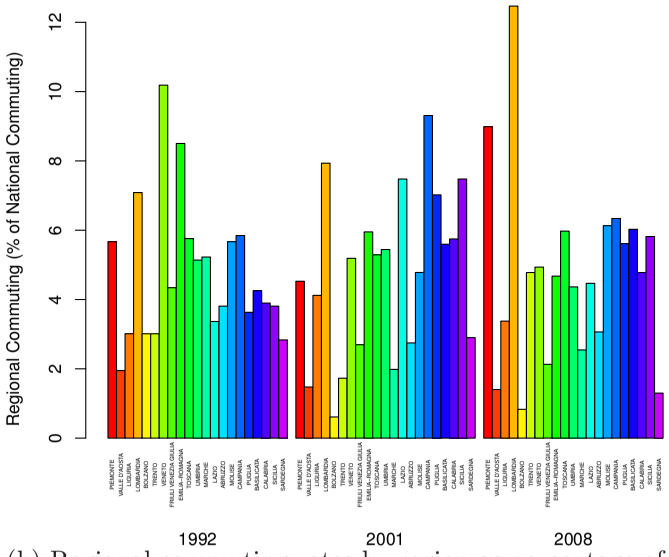


Figure 4: Italy - Commuting rate.



(a) Regional commuting rates by region.



(b) Regional commuting rates by region as percentage of national commuting.

Figure 5: Italy - Regional commuting rates.

	Non-commuters				Commuters			
	98.4%				1.6%			
	Mean	Stand. Dev.	Min	Max	Mean	Stand. Dev.	Min	Max
Female	0.35	0.48	0	1	0.18	0.38	0	1
Single	0.33	0.47	0	1	0.44	0.50	0	1
Age 16-24	0.12	0.32	0	1	0.16	0.37	0	1
Age 25-34	0.28	0.45	0	1	0.34	0.47	0	1
Age 35-49	0.40	0.49	0	1	0.37	0.48	0	1
Age 50-64	0.21	0.41	0	1	0.13	0.33	0	1
Start time	148.09	118.44	0	617	107.50	107.37	0	569
Primary education	0.59	0.49	0	1	0.46	0.50	0	1
Secondary education	0.33	0.47	0	1	0.40	0.49	0	1
Tertiary education	0.08	0.28	0	1	0.14	0.35	0	1
Resident in country from 1 year	0.00	0.01	0	1	0	0	0	0
Resident in country from 2 years	0.00	0.02	0	1	0	0	0	0
Resident in country from 3-4 years	0.00	0.03	0	1	0	0	0	0
Resident in country from 5-10 years	0.00	0.02	0	1	0	0	0	0
Resident in country from $\geq$ 10 years	1.00	0.04	0	1	1.00	0	1	1
Degree of urbanization	1.89	0.79	1	3	2.21	0.79	1	3
Self-employee	0.24	0.43	0	1	0.15	0.35	0	1
Employee	0.72	0.45	0	1	0.84	0.36	0	1
Family Worker	0.04	0.21	0	1	0.01	0.10	0	1
Full time	0.94	0.24	0	1	0.97	0.16	0	1
Temporary job $\leq$ 1 year	0.03	0.16	0	1	0.04	0.20	0	1
Temporary job 1-3 years	0.01	0.08	0	1	0.01	0.11	0	1
Temporary job $>$ 3 years	0.00	0.02	0	1	0	0	0	0
Flexible working hours	0.04	0.20	0	1	0.08	0.27	0	1
Usually working at home	0.06	0.24	0	1	0.02	0.15	0	1
Sometimes working at home	0.03	0.17	0	1	0.02	0.16	0	1
Never working at home	0.91	0.29	0	1	0.95	0.21	0	1
Looking for other job	0.06	0.24	0	1	0.09	0.28	0	1
Existence of second job	0.02	0.13	0	1	0.02	0.14	0	1
High skilled white collar	0.24	0.43	0	1	0.36	0.48	0	1
Low skilled white collar	0.29	0.45	0	1	0.25	0.43	0	1
High skilled blue collar	0.27	0.44	0	1	0.21	0.41	0	1
Low skilled blue collar	0.20	0.40	0	1	0.18	0.39	0	1
Agriculture	0.09	0.28	0	1	0.04	0.20	0	1
Energy and Manufacturing	0.25	0.43	0	1	0.21	0.41	0	1
Construction	0.09	0.28	0	1	0.14	0.34	0	1
Dist, Trans & Commun services	0.24	0.43	0	1	0.25	0.43	0	1
Finance & Other services	0.07	0.26	0	1	0.08	0.27	0	1
Non-market services	0.27	0.44	0	1	0.28	0.45	0	1
Firm size 1-10	0.56	0.50	0	1	0.40	0.49	0	1
Firm size 11-19	0.08	0.28	0	1	0.10	0.30	0	1
Firm size 20-49	0.14	0.35	0	1	0.19	0.39	0	1
Firm size $\geq$ 50	0.21	0.41	0	1	0.31	0.46	0	1
Northwest Italy	0.23	0.42	0	1	0.18	0.38	0	1
Northeast Italy	0.27	0.44	0	1	0.29	0.45	0	1
Central Italy	0.18	0.38	0	1	0.19	0.40	0	1
South Italy	0.22	0.42	0	1	0.27	0.44	0	1
Insular Italy	0.09	0.29	0	1	0.07	0.25	0	1
Relative per capita GDP	1.04	0.25	0.59	1.40	1.01	0.24	0.59	1.40
Relative remuneration	1.47	1.22	0.05	4.28	1.22	1.08	0.05	4.28
Relative unemployment rate	0.95	0.64	0.23	2.35	0.94	0.62	0.23	2.35
Relative house prices	1.05	0.41	0.39	2.03	0.96	0.37	0.39	2.03

Table 1: Descriptive Statistics in 1992

	Non-commuters				Commuters			
	97.0%				3.0%			
	Mean	Stand. Dev.	Min	Max	Mean	Stand. Dev.	Min	Max
Female	0.41	0.49	0	1	0.28	0.45	0	1
Single	0.36	0.48	0	1	0.54	0.50	0	1
Age 16-24	0.07	0.26	0	1	0.13	0.33	0	1
Age 25-34	0.26	0.44	0	1	0.41	0.49	0	1
Age 35-49	0.45	0.50	0	1	0.34	0.47	0	1
Age 50-64	0.22	0.42	0	1	0.13	0.33	0	1
Start time	153.60	123.73	0	623	94.05	103.39	0	479
Primary education	0.46	0.50	0	1	0.34	0.47	0	1
Secondary education	0.42	0.49	0	1	0.46	0.50	0	1
Tertiary education	0.13	0.33	0	1	0.20	0.40	0	1
Resident in country from 1 year	0.00	0.02	0	1	0.00	0.02	0	1
Resident in country from 2 years	0.00	0.03	0	1	0.00	0.02	0	1
Resident in country from 3-4 years	0.00	0.05	0	1	0.00	0.05	0	1
Resident in country from 5-10 years	0.00	0.06	0	1	0.00	0.04	0	1
Resident in country from $\geq$ 10 years	0.99	0.09	0	1	0.99	0.08	0	1
Degree of urbanization	1.74	0.73	1	3	1.93	0.77	1	3
Self-employee	0.22	0.41	0	1	0.11	0.31	0	1
Employee	0.74	0.44	0	1	0.89	0.32	0	1
Family Worker	0.04	0.20	0	1	0.01	0.08	0	1
Full time	0.91	0.29	0	1	0.95	0.22	0	1
Temporary job $\leq$ 1 year	0.03	0.18	0	1	0.07	0.25	0	1
Temporary job 1-3 years	0.01	0.12	0	1	0.03	0.17	0	1
Temporary job $>$ 3 years	0.00	0.07	0	1	0.01	0.09	0	1
Flexible working hours	0.02	0.13	0	1	0.02	0.14	0	1
Usually working at home	0.04	0.19	0	1	0.02	0.12	0	1
Sometimes working at home	0.02	0.16	0	1	0.03	0.16	0	1
Never working at home	0.94	0.24	0	1	0.96	0.20	0	1
Looking for other job	0.06	0.23	0	1	0.11	0.31	0	1
Existence of second job	0.01	0.11	0	1	0.01	0.11	0	1
High skilled white collar	0.31	0.46	0	1	0.42	0.49	0	1
Low skilled white collar	0.32	0.47	0	1	0.23	0.42	0	1
High skilled blue collar	0.20	0.40	0	1	0.18	0.38	0	1
Low skilled blue collar	0.17	0.38	0	1	0.16	0.37	0	1
Agriculture	0.06	0.23	0	1	0.02	0.15	0	1
Energy and Manufacturing	0.24	0.43	0	1	0.23	0.42	0	1
Construction	0.06	0.23	0	1	0.10	0.30	0	1
Dist, Trans & Commun services	0.25	0.43	0	1	0.18	0.39	0	1
Finance & Other services	0.10	0.30	0	1	0.11	0.31	0	1
Non-market services	0.30	0.46	0	1	0.36	0.48	0	1
Firm size 1-10	0.25	0.43	0	1	0.18	0.38	0	1
Firm size 11-19	0.13	0.33	0	1	0.17	0.37	0	1
Firm size 20-49	0.21	0.41	0	1	0.32	0.47	0	1
Firm size $\geq$ 50	0.41	0.49	0	1	0.33	0.47	0	1
Northwest Italy	0.26	0.44	0	1	0.19	0.39	0	1
Northeast Italy	0.22	0.41	0	1	0.17	0.37	0	1
Central Italy	0.19	0.39	0	1	0.18	0.39	0	1
South Italy	0.23	0.42	0	1	0.37	0.48	0	1
Insular Italy	0.10	0.29	0	1	0.09	0.29	0	1
Relative per capita GDP	1.04	0.26	0.64	1.37	0.96	0.26	0.64	1.37
Relative remuneration	1.57	1.24	0.05	4.29	1.23	1.09	0.05	4.29
Relative unemployment rate	0.97	0.76	0.20	2.71	1.18	0.80	0.20	2.71
Relative house prices	1.03	0.30	0.46	1.65	0.97	0.33	0.46	1.65

Table 2: Descriptive Statistics in 2002

	Non-commuters				**Commuters**			
	96.8%				3.2%			
	Mean	Stand. Dev.	Min	Max	Mean	Stand. Dev.	Min	Max
Female	0.41	0.49	0	1	0.27	0.45	0	1
Single	0.37	0.48	0	1	0.46	0.50	0	1
Age 16-24	0.06	0.25	0	1	0.09	0.28	0	1
Age 25-34	0.20	0.40	0	1	0.30	0.46	0	1
Age 35-49	0.47	0.50	0	1	0.41	0.49	0	1
Age 50-64	0.26	0.44	0	1	0.20	0.40	0	1
Start time	152.95	127.56	0	647	112.78	114.13	0	551
Primary education	0.39	0.49	0	1	0.30	0.46	0	1
Secondary education	0.45	0.50	0	1	0.44	0.50	0	1
Tertiary education	0.16	0.37	0	1	0.26	0.44	0	1
Resident in country from 1 year	0.00	0.02	0	1	0.00	0.03	0	1
Resident in country from 2 years	0.00	0.03	0	1	0.00	0.02	0	1
Resident in country from 3-4 years	0.00	0.06	0	1	0.00	0.05	0	1
Resident in country from 5-10 years	0.02	0.15	0	1	0.01	0.12	0	1
Resident in country from $\geq$ 10 years	0.04	0.19	0	1	0.04	0.20	0	1
Degree of urbanization	1.92	0.76	1	3	2.10	0.73	1	3
Self-employee	0.24	0.43	0	1	0.16	0.37	0	1
Employee	0.74	0.44	0	1	0.84	0.37	0	1
Family Worker	0.02	0.14	0	1	0.00	0.05	0	1
Full time	0.85	0.35	0	1	0.92	0.28	0	1
Temporary job $\leq$ 1 year	0.08	0.27	0	1	0.14	0.35	0	1
Temporary job 1-3 years	0.01	0.11	0	1	0.02	0.14	0	1
Temporary job $>$ 3 years	0.01	0.09	0	1	0.01	0.10	0	1
Flexible working hours	0.01	0.09	0	1	0.01	0.09	0	1
Usually working at home	0.04	0.20	0	1	0.04	0.20	0	1
Sometimes working at home	0.02	0.13	0	1	0.02	0.13	0	1
Never working at home	0.94	0.24	0	1	0.94	0.24	0	1
Looking for other job	0.03	0.16	0	1	0.03	0.17	0	1
Existence of second job	0.02	0.14	0	1	0.02	0.13	0	1
High skilled white collar	0.40	0.49	0	1	0.48	0.50	0	1
Low skilled white collar	0.23	0.42	0	1	0.19	0.39	0	1
High skilled blue collar	0.19	0.39	0	1	0.16	0.37	0	1
Low skilled blue collar	0.18	0.38	0	1	0.17	0.38	0	1
Agriculture	0.05	0.21	0	1	0.01	0.11	0	1
Energy and Manufacturing	0.21	0.40	0	1	0.20	0.40	0	1
Construction	0.08	0.28	0	1	0.12	0.33	0	1
Dist, Trans & Commun services	0.25	0.43	0	1	0.25	0.43	0	1
Finance & Other services	0.13	0.33	0	1	0.13	0.34	0	1
Non-market services	0.29	0.45	0	1	0.28	0.45	0	1
Firm size 1-10	0.31	0.46	0	1	0.20	0.40	0	1
Firm size 11-19	0.12	0.32	0	1	0.14	0.35	0	1
Firm size 20-49	0.13	0.33	0	1	0.15	0.36	0	1
Firm size $\geq$ 50	0.27	0.45	0	1	0.39	0.49	0	1
Northwest Italy	0.28	0.45	0	1	0.26	0.44	0	1
Northeast Italy	0.23	0.42	0	1	0.17	0.38	0	1
Central Italy	0.17	0.37	0	1	0.17	0.38	0	1
South Italy	0.22	0.42	0	1	0.32	0.47	0	1
Insular Italy	0.10	0.31	0	1	0.07	0.26	0	1
Relative per capita GDP	1.04	0.25	0.65	1.34	1.00	0.25	0.65	1.34
Relative remuneration	1.57	1.30	0.05	4.31	1.39	1.27	0.05	4.31
Relative unemployment rate	0.98	0.55	0.34	2.00	1.03	0.53	0.34	2.00
Relative house prices	1.02	0.35	0.48	1.96	0.98	0.36	0.48	1.96

Table 3: Descriptive Statistics in 2008

	1992	1998	2002	2006	2008
Female	−0.011***	−0.010***	−0.012***	−0.013***	−0.014***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Single	0.004***	0.008***	0.009***	0.004***	0.004***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Age 16-24	−0.005**	−0.011***	−0.006	−0.001	−0.008**
	(0.002)	(0.003)	(0.004)	(0.004)	(0.005)
Age 25-34	−0.003**	−0.003	0.002	−0.001	−0.002
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Age 35-49	−0.002	−0.005***	−0.006***	−0.003	−0.007***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Start time	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary education	−0.003**	0.008***	−0.001	−0.004**	−0.001
	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Tertiary education	0.006**	−0.007	0.010***	0.021***	0.018***
	(0.003)	(0.007)	(0.003)	(0.003)	(0.003)
Resident in country from 1 year	−0.016	−0.023***	−0.018	−0.032***	−0.016**
	(0.010)	(0.004)	(0.012)	(0.005)	(0.008)
Resident in country from 2 years	−0.020***	0.009	−0.004	−0.017	−0.030***
	(0.004)	(0.032)	(0.026)	(0.016)	(0.005)
Resident in country from 3-4 years	−0.013***	−0.011	0.001	0.001	−0.015**
	(0.003)	(0.016)	(0.014)	(0.011)	(0.007)
Resident in country from 5-10 years	−0.017***	−0.014	−0.013*	0.004	−0.011***
	(0.003)	(0.008)	(0.007)	(0.006)	(0.004)
Degree of urbanisation	0.009***	0.012***	0.010***	0.010***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Employee	0.002*	0.004**	0.010***	0.012***	0.017***
	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Family worker	−0.002	0.002	−0.001	0.003	0.003
	(0.002)	(0.003)	(0.003)	(0.002)	(0.003)
Full time	0.004**	0.008***	0.009***	0.001	0.004*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Temporary job $\leq$ 1 year	0.004	0.010*	0.017***	0.018***	0.011***
	(0.004)	(0.005)	(0.005)	(0.004)	(0.004)
Temporary job 1-3 years	0.008	−0.006	0.006	0.006	0.004
	(0.008)	(0.007)	(0.005)	(0.007)	(0.010)
Flexible working hours	0.016***	0.008***	0.013**	0.001	−0.006
	(0.004)	(0.003)	(0.006)	(0.010)	(0.007)
Usually working at home	−0.003	−0.005	−0.008	0.007	0.007
	(0.003)	(0.005)	(0.005)	(0.007)	(0.007)
Never working at home	0.003	0.002	−0.004	0.004	−0.001
	(0.003)	(0.004)	(0.005)	(0.005)	(0.006)
Looking for other job	0.003	0.012***	0.007**	0.006	−0.002
	(0.003)	(0.003)	(0.004)	(0.004)	(0.004)
Existence of second job	−0.004	0.004	−0.004	−0.003	−0.009*
	(0.004)	(0.006)	(0.006)	(0.005)	(0.005)
High skilled white collar	0.009***	0.011***	0.015***	0.007***	0.007***
	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Low skilled white collar	0.002	0.000	0.003	0.006***	−0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.003)
High skilled blue collar	−0.003**	−0.002	0.002	0.002	0.000
	(0.001)	(0.002)	(0.002)	(0.002)	(0.003)
Agriculture	−0.013***	−0.011***	−0.020***	−0.027***	−0.027***
	(0.002)	(0.004)	(0.004)	(0.005)	(0.004)
Energy and Manufacturing	−0.010***	−0.015***	−0.015***	−0.016***	−0.015***
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
Dist, Trans & Commun services	−0.002	−0.008***	−0.013***	−0.015***	−0.009**
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
Finance & Other services	−0.007**	−0.012***	−0.015***	−0.014***	−0.010**
	(0.003)	(0.004)	(0.004)	(0.004)	(0.004)
Non-market services	−0.011***	−0.014***	−0.019***	−0.023***	−0.018***
	(0.002)	(0.003)	(0.004)	(0.004)	(0.004)
Firm size 1-10	−0.006***	−0.016***	0.000	−0.013***	−0.010***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Firm size 11-19	0.000	−0.015***	0.009***	−0.004	0.003
	(0.002)	(0.003)	(0.002)	(0.003)	(0.003)
Firm size 20-49	−0.001	−0.009***	0.014***	−0.003	−0.001
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)
Northwest Italy	0.000	0.004*	0.004	0.008**	0.005
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
Northeast Italy	0.001	0.001	−0.001	0.000	−0.003
	(0.002)	(0.002)	(0.002)	(0.003)	(0.004)
South Italy	−0.014***	0.014***	0.003	−0.005	−0.010*
	(0.004)	(0.005)	(0.006)	(0.007)	(0.008)
Insular Italy	−0.022***	−0.002	−0.013**	−0.019**	−0.015**
	(0.004)	(0.005)	(0.006)	(0.007)	(0.009)
Relative per capita GDP	−0.026***	−0.026***	−0.012	−0.088***	−0.113***
	(0.008)	(0.010)	(0.014)	(0.015)	(0.021)
Relative remuneration	−0.001	0.000	−0.003**	0.002	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Relative unemployment rate	−0.001	−0.010***	0.005	−0.023***	−0.034***
	(0.003)	(0.004)	(0.003)	(0.006)	(0.009)
Relative house price	−0.008***	0.001	0.003	0.002	0.009**
	(0.002)	(0.003)	(0.004)	(0.003)	(0.004)
Sample size	59345	57894	58287	54698	55543
Adj. R^2	0.012	0.015	0.019	0.019	0.017

Notes: Heteroskedasticity robust standard errors in parenthesis.

Table 4: Linear Probability Model: Results

	LPM	Logit (APE)	Probit (APE)
Female	−0.014***	−0.015***	−0.015***
	(0.002)	(0.002)	(0.002)
Single	0.004***	0.004**	0.004**
	(0.002)	(0.002)	(0.002)
Age 16-24	−0.008**	−0.008*	−0.008*
	(0.005)	(0.004)	(0.004)
Age 25-34	−0.002	−0.004	−0.004
	(0.003)	(0.003)	(0.003)
Age 35-49	−0.007***	−0.008***	−0.008***
	(0.002)	(0.003)	(0.002)
Start time	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)
Primary education	−0.001	−0.002	−0.002
	(0.002)	(0.002)	(0.002)
Tertiary education	0.018***	0.019***	0.019***
	(0.003)	(0.003)	(0.003)
Resident in country from 1 year	−0.016**	−0.020*	−0.019
	(0.008)	(0.008)	(0.009)
Resident in country from 2 years	−0.030***	−0.023***	−0.023***
	(0.005)	(0.004)	(0.004)
Resident in country from 3-4 years	−0.015**	−0.014*	−0.014*
	(0.007)	(0.007)	(0.007)
Resident in country from 5-10 years	−0.011***	−0.012***	−0.012***
	(0.004)	(0.004)	(0.004)
Degree of urbanisation	0.013***	0.013***	0.013***
	(0.001)	(0.001)	(0.001)
Employee	0.017***	0.017***	0.016***
	(0.002)	(0.002)	(0.002)
Family worker	0.003	−0.016**	−0.014**
	(0.003)	(0.006)	(0.006)
Full time	0.004*	0.006**	0.005*
	(0.002)	(0.003)	(0.003)
Temporary job ≤ 1 year	0.011***	0.009**	0.009*
	(0.004)	(0.003)	(0.004)
Temporary job 1-3 years	0.004	0.001	0.001
	(0.010)	(0.007)	(0.007)
Flexible working hours	−0.006	−0.005	−0.003
	(0.007)	(0.007)	(0.007)
Usually working at home	0.007	0.009	0.008
	(0.007)	(0.010)	(0.010)
Never working at home	−0.001	−0.002	−0.003
	(0.006)	(0.007)	(0.007)
Looking for other job	−0.002	−0.002	−0.002
	(0.004)	(0.004)	(0.004)
Existence of second job	−0.009*	−0.009**	−0.009*
	(0.005)	(0.004)	(0.004)
High skilled white collar	0.007***	0.008***	0.008***
	(0.003)	(0.003)	(0.003)
Low skilled white collar	−0.002	−0.002	−0.002
	(0.003)	(0.003)	(0.003)
High skilled blue collar	0.000	0.000	0.000
	(0.003)	(0.003)	(0.003)
Agriculture	−0.027***	−0.021***	−0.021***
	(0.004)	(0.002)	(0.002)
Energy and Manufacturing	−0.015***	−0.013***	−0.012***
	(0.004)	(0.003)	(0.003)
Dist, Trans & Commun services	−0.009**	−0.006**	−0.006*
	(0.004)	(0.003)	(0.003)
Finance & Other services	−0.010**	−0.008**	−0.008**
	(0.004)	(0.003)	(0.003)
Non-market services	−0.018***	−0.017***	−0.016***
	(0.004)	(0.003)	(0.003)
Firm size 1-10	−0.010***	−0.012***	−0.011***
	(0.002)	(0.002)	(0.002)
Firm size 11-19	0.003	0.002	0.003
	(0.003)	(0.003)	(0.003)
Firm size 20-49	−0.001	−0.002	−0.001
	(0.003)	(0.003)	(0.003)
Northwest Italy	0.005	0.006**	0.007**
	(0.004)	(0.003)	(0.003)
Northeast Italy	−0.003	−0.001	−0.001
	(0.004)	(0.003)	(0.003)
South Italy	−0.010*	−0.011*	−0.012**
	(0.008)	(0.006)	(0.006)
Insular Italy	−0.015**	−0.015**	−0.015***
	(0.009)	(0.005)	(0.005)
Relative per capita GDP	−0.113***	−0.117***	−0.118***
	(0.021)	(0.022)	(0.021)
Relative remuneration	0.003***	0.004**	0.004***
	(0.001)	(0.002)	(0.001)
Relative unemployment rate	−0.034***	−0.033***	−0.034***
	(0.009)	(0.008)	(0.008)
Relative house price	0.009***	0.008**	0.008*
	(0.004)	(0.004)	(0.004)
Percent correctly predicted	95.1	95.1	95.0
ones	13.3	13.8	12.9
Pseudo-R^2	0.017	0.026	0.025

Notes: Heteroskedasticity-robust (LPM) and bootstrap standard errors (APEs) in parenthesis.

Table 5: Robustness checks: 2008