

Is there a Southern-sclerosis? Worker reallocation and regional unemployment in Italy

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Abstract

This paper aims to study whether the local variation in unemployment rates is related to labour turnover and what is the sign of such a relationship. In addition, the paper aims to assess the relative impact of inflow and outflow from unemployment on the dynamics of the local unemployment rate. The empirical analysis is based on the longitudinal files of the Italian labour force survey over the years from 2004 to 2010. We find that turnover, as well as inflows and outflows separately, are *ceteris paribus* positively related to the unemployment level. This general conclusion is robust to the use of different panel estimators. We also find that elasticity is larger in the case of the inflow rate than for the outflow rate.

Keywords: Regional Unemployment; Labour Turnover; Structural change; Panel Data

JEL Classification: C33; J63; P25; P52; R23

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1. Introduction

Based on theoretical reasoning the relationship between labour market turnover and the unemployment rate can be of different nature (Aghion and Blanchard, 1994). There could be either a positive relationship or no relationship. Intuitively, in the latter case, high unemployment regions have an insufficient ability to create new jobs. In the former case, large turnover is the result of continuous high rates of layoff and hiring, thus leading to a (possibly temporary) unemployment increase. In turn, industrial restructuring causing sectoral shifts might explain the high level of turnover of high unemployment regions (so-called Lilien hypothesis). Alternatively, large labour market flows might be the sign of greater labour market flexibility, which is usually associated with efficient labour markets and thus relatively lower unemployment (so-called Krugman hypothesis).

The aim of this paper is to empirically discriminate between these alternative theoretical hypotheses by exploiting the geographical differentiation of labour turnover and unemployment. Ferragina and Pastore (2008) suggest that this test constitutes a “screening device” to distinguish the case when unemployment is due also to some region-specific shock (namely the high degree of labour turnover in high unemployment regions caused by industrial restructuring) and when it is instead due solely to labour market rigidities. Note that the policy implications of these alternative hypotheses are partly different, since a low job finding rate in high unemployment regions essentially suggests the need for supply side policies, whilst a positive relationship between labour market turnover and unemployment requires interventions on the demand side as well.

We use longitudinal data on Italy over the years from 2004 to 2010. This is the first paper to study in a systematic way the relationship between labour turnover and the rate of unemployment using labor force survey (LFS) data. Until recently, the data on worker turnover were unavailable.

Further, the empirical evidence available in the literature is neither large nor unambiguous. The main reason is the limited availability of suitable longitudinal data to measure labour market dynamics at a local level. In addition, the sign of the relation under consideration might change over time. In this paper we try to fill those gaps.

We find evidence of a positive relationship between worker turnover and unemployment rate. In all the considered years, indeed, the rate of turnover is higher in the regions where also the unemployment rate is higher.

We also consider the worker turnover rate and its main components of accession and separations rates. As expected we find evidence of regional discrepancies between such indicators. The South is the area with the highest worker turnover, especially with respect to the North-West of the Country. To examine the possible sources of worker turnover and their regional differences, we carry out econometric estimates. More in detail, we add control for individual characteristics, type of occupation, firm size, working time (part/full time), and type of contract.

The estimates suggest that all the explanatory variables do play a role in explaining the worker turnover and also its regional differences. We find that the youngest show a highest worker turnover compared to the other age groups, with the partial exception of the eldest workers.

The worker turnover reduces with education and, as expected and shown also by other studies (e.g. Naticchioni et. Al, 2006), with firm sizes. Finally, worker turnover decreases for part time workers and increases for temporary workers. Since a large share of part time contracts are permanent (82.56% of part time workers in our sample have a permanent contract) it is reasonable to find a reduced turnover for such a kind of workers. Temporary workers, as expected, do show a high turnover.

The paper proceeds as follows. Section 2 offers a survey of the literature and the relevant theoretical foundations as well as some available empirical evidence. Section 3 describes the methodologies used both to study the relationship between unemployment rate and turnover and to understand the determinants of worker turnover at detailed geographical level. Section 4 describes the data and the variables used. Section 5 presents the analysis of the results. Concluding Section 6 concludes.

2. A survey of the literature

Before presenting the data and the econometric methodology, this section defines the main hypotheses to test. The first section focuses on the link between local worker reallocation and unemployment, and shows that different a priori relationships might possibly exist among them and brings to the fore three alternative hypotheses to test. The section also summarises the main empirical contributions that support each hypothesis. The ensuing section argues that the empirical literature has attempted to disentangle three possible sources of differences in labour reallocation across regions, namely sectoral shifts, aggregate disturbances and job-to-job moves. The last section discusses the main findings of the literature on Italy.

2.1. The link between local worker reallocation and unemployment

The Aghion and Blanchard (1994) model can be used as a framework to study the way how labour market dynamics affects the regional distribution of unemployment. Assume that the hiring rate is a bell-shaped function of unemployment. This non-linearity depends on the double effect of unemployment on hiring: on the one hand, unemployment reduces wages, and therefore fosters private sector growth, since with unemployment increasing there is greater competition for jobs and downward pressure on wages; on the other hand, though, unemployment raises the level of taxes per worker, to pay unemployment benefits, thus reducing profits. Assume also that the separation rate is a control variable and it is therefore independent of unemployment. When the separation rate is above (below) the hiring rate, unemployment increases (reduces).

As Ferragina and Pastore (2008) argue, although thought to explain national unemployment, this framework might also apply to local labour markets, provided that they are separated from each other due to low migration / commuting. Then, two alternative hypotheses are in order:

H_1 : worker reallocation correlates positively with regional unemployment;

H_0 : worker reallocation is independent of regional unemployment.

According to H_1 , in high unemployment regions more jobs are destroyed and created at the same time. In the spirit of the Aghion and Blanchard model, this happens because each region has a specific rate of structural change, but other hypotheses are also possible, as later discussion shows. According to H_0 , instead, the same aggregate shock has yielded different effects in different regions. High unemployment regions have experienced an unsuccessful process of structural change in the past, with a too high separation rate at the beginning, so that the unemployment rate exceeds its equilibrium level. Only at a later stage separation rates converge across regions.

In fact, the above hypotheses configures an empirical law to detect the case when unemployment is due to some region-specific shock (H_1) and when it is due to labour market rigidities (H_0). The policy implications of these alternative hypotheses are partly different. Whilst a low job finding rate essentially suggests the need for supply side policies in favour of the long-term unemployed, namely increasing labour market flexibility and/or educational reforms and active labour market policy on a large scale, H_1 also requires interventions on the demand side. For instance, assuming that the government is able to do so, it should reduce the rate of separation and/or increase the life expectancy of private businesses in the high unemployment regions. This might in turn require removing the sources of structural change in high unemployment regions.

The empirical evidence available in the literature is neither large nor unambiguous. The main reason is the limited availability of suitable longitudinal data to measure labour market dynamics at a local level. In addition, the sign of the relation under consideration might change over time.

Robson (2001) finds no correlation between worker reallocation and unemployment across the UK macro-regions in the decade 1984-1994. In the case of transition countries, some authors (such as Boeri and Scarpetta 1996; Boeri 2000; the World Bank 2001; Rutkowski 2003) interpret the low rate of monthly labour turnover based on employment registry data of high unemployment regions as a consequence of low labour market dynamism. Other studies find evidence that high unemployment regions are those where the degree of worker turnover is higher. For the UK, Armstrong and Taylor (1985) use the male monthly inflow from the employment registry data and find that they positively correlate to local unemployment rates. Newell and Pastore (2006) use labour force survey measures of annual gross worker flows and find a correlation coefficient between the job separation rate and the unemployment rate of 0.76, significant at the one-percent level, during the period 1994-1997. Contini and Trivellato (2006) find the highest turnover rate in the traditionally high unemployment regions of

Mezzogiorno. Naticchioni, Rustichelli and Scialà (2006) find similar evidence using the ISFOL panel based on ISTAT Labour Force Survey data.

The well-known Krugman (1994) hypothesis provides an explanation of H_0 . It states that the higher is the degree of labour reallocation experienced in a country (region), the lower is also the unemployment rate: greater labour reallocation would mean, in fact, lower frictional and long-term unemployment. In other words, there would be a spatially asymmetric impact of rigid labour market institutions. Extensive literature highlights, among other things, the role of rigid wages and legislation protecting employment, non-employment subsidies and early retirement schemes (see, among others, Boeri 2000; World Bank 2001; Rutkowski and Przybala 2002; Funck and Pizzati 2002; 2003). Garonna and Sica (2000) find a negative association between the Lilien index of structural change and the unemployment rate in Italy: in particular, sectoral and interregional reallocations in Italy would reduce unemployment, rather than increasing it. Böckerman (2003) takes the same result for Finland as evidence of Schumpeterian “creative destruction”.

A related issue is whether it is the inflow or the outflow rate to affect unemployment over time. Blanchard and Summers (1986) claim that a higher degree of cyclicity of the hiring rate is behind fluctuations in US unemployment. Burda and Wyplosz (1994) note that European countries differ in terms of the degree of cyclicity of hiring and firing rates. While some EU countries follow US trends, others, instead, have a cyclical firing rate. Layard, Nickell and Jackman (1991) summarise this research partly confirming the hypothesis that a low job finding rate is behind high unemployment rates, due to the increase in long-term unemployment and its persistent impact on average unemployment. Using micro-level data, Shimer (2007) proposes a new methodology which demonstrates that it is the evolution of the job finding rate - and not that of the flow into unemployment - reproduces the cyclicity observed in the unemployment rate¹. A number of studies have applied Shimer' analysis for other countries establishing similar conclusions (see, among others, Petrongolo and Pissarides, 2008, for the UK, France and Spain; Bachman, 2009, for Germany; and Strawinski, 2009, for Poland).

2.2. The sources of worker reallocation

If H_1 holds true, what are the sources of the reallocation and why are they different across regions? Several hypotheses have been raised in the literature:

H_{13} : different sectoral shifts across regions (Lilien hypothesis);

H_{12} : aggregate disturbances with spatially asymmetric effects (Abraham and Katz hypotheses);

¹ Hall (2007) subscribes to Shimer's view, while Elsby et al. (2009) and Fujita and Ramey (2009) suggest alternative explanations. Fujita and Ramey (2009) find that cyclical changes in the separation rate is negatively correlated with changes in productivity and move contemporaneously with them, whereas the job finding rate is positively correlated with and tends to lag after productivity, which is consistent with the Aghion and Blanchard (1994) theoretical framework adopted in this paper.

H₁₁: a crowding out of employed job seekers in low unemployment regions (Burgess hypothesis);

According to *H₁₃*, some sectors/regions experience a permanent reduction in labour demand that causes local unemployment. Lilien (1982) found a positive correlation over time between the aggregate unemployment rate and the cross-industry dispersion of employment growth rates in the US. Most studies use some variation of the Lilien index². However, Abraham and Katz (1986) and a number of related studies (such as Neelin, 1987; Fortin and Araar, 1997) argue against the underlying assumption that sectoral shifts can take place independent of aggregate labour demand reductions³.

To overcome these criticisms, the ensuing research in the field has pursued the aim of finding empirical ways of disentangling sectoral shifts and aggregate disturbances. Several approaches have been developed. Neumann and Topel (1991) elaborate a macroeconomic model where the equilibrium level of unemployment in a region depends on its exposure to the risk of within-industry employment shocks and on their degree of industrial diversity. Their approach has stimulated further research (see, for instance, Chiarini and Piselli 2000; and Robson 2009)⁴. Hyclak (1996, p. 655) reports a negative correlation of -0.72 between sectoral shifts and net job growth in a sample of 200 US metropolitan areas over the years 1976-1984. Holzer (1991) proposes the sales growth rates to disentangle shifts *between* and *within* local markets and find that the former have much greater impact than the latter.

According to Burgess (1993), the greater worker reallocation in high unemployment regions is due to the lower job opportunities for unemployed job seekers in low unemployment regions. In these regions, in fact, the unemployed are crowded out by employed job seekers who are encouraged to search for better jobs. Consequently, one would observe a higher worker turnover in high unemployment regions simply because in these regions the unemployed who find jobs are a larger relative number with respect to their peers in low unemployment regions.

A number of studies have tested the Burgess hypothesis. Van Ours (1995) finds only partial evidence of competition between employed and unemployed job seekers in the Netherlands. Broersma (1997) finds similar evidence in the flexible UK and rigid Netherlands. For the UK, Robson (2001) finds evidence of employed job seekers crowding out the unemployed especially in low

² Among the available studies, it is worth mentioning Samson (1985) for Canada; Berg (1994), Barbone, Marchetti and Paternostro (1999), Newell and Pastore (2006) for Poland; Krajnyák and Sommer (2004) for the Czech Republic; Robson (2009, p. 282) for the UK.

³ There are sources of structural change that tend to be transitory and others that are permanent. The former include the opening up to international trade of new competitors and the introduction of new technologies causing some productions to go out of market. Structural and permanent 'weaknesses' of high unemployment regions, which cause their low competitiveness and attractiveness to investment from abroad, include: a) Low human and social capital endowment; b) High (organised) crime rates; c) Reduction in migration as an adjustment mechanism; d) Economic dependence on more developed regions; e) Poverty traps. For a more detailed analysis, see Caroleo and Pastore (2010).

⁴ The above discussion shows the existence of a clear link between Lilien's argument and Simon (1988) and Simon and Nardinelli's (1992) hypothesis of a portfolio effect in the labour market (see for surveys Elhorst 2003, p. 735).

unemployment regions. Burgess and Profit (2001) find that high unemployment levels in neighbouring areas raise the number of local vacancies but lower the local outflow from unemployment. Eriksson and Lagerström (2006) study the Swedish Applicant Database and find evidence that unemployed seekers face a lower contact probability than employed job seekers.

In conclusion of this section, it should be noted that no study compares the above hypotheses in the same theoretical framework. Most studies provide instead evidence of only one source or, in several cases, they contrast two hypotheses.

3. Methodology

The aim of this paper is threefold. First, we assess the relative impact of inflows and outflows from unemployment on the local unemployment rate (regional level). Second, we analyse the worker turnover and its components of accession and separation rates at the regional level. Finally, we attempt to explain the sources of worker turnover and of its regional differences.

In what follows we sketch the methodologies adopted for each purposes.

The Italian LFS data include information on inflows and outflows of unemployment. In detail, for each yearly file, we have the information on the number of individuals entering and leaving the state of unemployment for the states of employment and/or inactivity. Those numbers are divided by the total labour force in each period to get the inflows and outflows rate. The turnover rate is then defined as the sum of the inflows and the outflows. Those indicators, as well as the local unemployment rate, are computed at the regional level. This is one of the advantage of the Italian LFS data, which allows robust estimates also at the regional level. The relation between the regional unemployment rate and the turnover is estimated and reported in Section 5.

The second set of estimates aims at measuring the worker turnover and its main components. We define the gross worker turnover (gwt) at time t as the number of accessions plus the number of separations that occur during the interval from $t-1$ to t .⁵ For our kind of data the interval from $t-1$ to t is of twelve months. The accession and separation rate and the gross worker turnover rate are computed by dividing the gwt by the average employment. For our computations, we used the ISTAT LFS data described in the next section. The sample units are the employees aged between 15 and 64 years. Our estimates refer to the period 2004-2010 and are computed at the NUTS1 or macro-regional level.⁶

Finally, to explain the sources of worker turnover and the reasons behind its regional differences, we use a simple econometric model on Italian LFS data. More in detail, we carry out a logit estimate taking as a dependent variable the fact of having had a worker turnover flow in the last year.⁷ Among

⁵ The gross worker turnover definition is derived from Davis-Haltiwanger (1995) and Davis and Schuh (1996).

⁶ This is the acronym of “Nomenclatura delle unità territoriali statistiche”. More precisely, we refer to the first level of disaggregation, NUTS1, corresponding to the macro-region. Following this classification, there are four NUTS1 for Italy – North-West, North-East, Centre and South.

⁷ The worker turnover is the sum of inflows from unemployment and inactivity to employment (accessions) and the outflows from employment to unemployment and inactivity (separations).

the control variables we have individual characteristics (gender, age, educational level), the region of residence (four macro NUTS1-level regions), and additional variables on firm size, type of occupation, working time (part or full time) and type of contract (fixed term or permanent contract). In the first exercise, we introduce as covariates only the regional areas of residence, which are the variables we are mainly interested in. In the second exercise we add all the other possible explanations for the geographical differentials in the worker turnover indicators. The variables and the findings of all the estimation exercises are explained in detail in section 4 and 5, respectively.

4. Data and variables

Our sample is extracted from ISTAT Labour Force Survey data. This is a rotating panel survey based on the principles set out by the International Labour Organization (ILO) and on harmonized methodology across most of the countries in the OECD area.⁸ The longitudinal component of the survey comprises almost 70,000 individuals per year.

We analyze the time period 2004–2011. In order to examine the worker turnover of (almost) the overall labour force we include in our sample the employees over the age of 15 and under the age of 64. We drop individuals over the age of 64 to avoid to get mixed up with retirement issue. We also drop self-employed, individuals who were in army or with missing values for some variables used in the econometric analysis.

Considering the working age employees, 150,508 observations remain over the period 2004–2011.

Table 1 displays the descriptive statistics of the variables used in the econometric analysis of the worker turnover. The dependent variable, turnover, is a dummy variable for the presence/absence of worker turnover.

On average, the 55.6% of our sample of employees are men during the period 2004-2011. We distinguished between five age groups: very young workers (15-24 years old), young workers (25-34 years old), middle aged workers (35-44 years old) mature and older workers (45-54 and 55-64 years old, respectively).

Educational variables are defined according to UNESCO's International Standard Classification of Education (ISCED). The Italian LFS survey distinguishes between education completed in the lower secondary stage (ISCED 0-2), upper secondary education (ISCED 3), and post-secondary or tertiary education (ISCED 5-7). Almost half of the sample has a lower secondary educational attainment (47.5%), around the 40% attended upper secondary education and the remaining (around 14%) has a post-secondary or tertiary educational title.

Indicators for the type of occupation and for the firm size are also included in the model, as likely to affect worker turnover.

⁸ For a detailed description of the survey, see Gazzelloni (2006) and ISTAT (2009).

Four dummy variables for the geographical area of residence (North-West, North-East, Centre, and South) are included in the model specification. Around one half of the sample lives in the North of Italy (almost equally distributed among North-West and North-East). Around the 33% of the employees lives in the Centre during the period 2004-2011, whilst the remainder (around 16%) in the South.

A set of covariates are used to capture job heterogeneity. We include dummy indicators for part-time and temporary jobs, since likely to affect the likelihood of worker turnover.

Finally, a set of time dummies for the years 2004-2011 were introduced since, as explained above, we carried out pooled estimates for the overall period.

5. Findings

We find evidence supporting H1 in all the considered years. In fact, Figure 1 shows that the rate of turnover is higher in the regions where also the unemployment rate is higher. We indeed find the highest turnover rates in the traditionally high unemployment regions of the South of Italy. For instance, in 2004-2005 we find the highest turnover rates (19-21%) in Campania, Puglia and Sicilia, which shows the highest unemployment rates (15-17%). This pattern is confirmed for the overall period examined. This is in line with the findings of Contini and Trivellato (2006) on LFS data and Naticchioni et. Al (2006) on ISFOL data.

We also compute the worker turnover by NUTS1-level regions and we find geographical discrepancies in such indicators. To understand the sources of the worker turnover and the reasons behind the geographical differences, we carry out a simple econometric on the ISTAT LFS data for the period 2004-2011.

Before introducing our findings, it is necessary to remind that the geographical differential in labour market flows is a structural feature of the Italian labour market (Bertola and Garibaldi, 2002; Paggiaro, 1999; Ricciardi, 1991). This is confirmed in the present work.

To explain the sources of worker turnover and the reasons behind its regional differences, we use a simple econometric model on Italian LFS data. More in detail, we carry out a logit estimate taking as a dependent variable the fact of having had a worker turnover flow in the last year. Among the control variables we include individual characteristics (gender, age, educational level), the region of residence (four macro NUTS1-level regions), and additional variables on firm size, type of occupation, working time (part or full time) and type of contract (fixed term or permanent contract).

In the first exercise, we introduce as covariates only the regional areas of residence, which are the variables we are mainly interested in. Table 3 shows the results. We introduce as covariates only the regional dummies, taking the South as base category. They are significantly different (at the 1% significance level) from one another for the overall 2004-2011 period. The South is the area with the highest turnover, and especially with respect to the North-West of the Country.

In the second exercise we add all the other possible sources of worker turnover and we attempt to explain its geographical differential. Table 4 shows the estimates with all the variables explained above (Section 4). Moving from Tables 3 to 4 the ranking of the regional dummies remain partially, and all the control variables play a role on worker turnover. The South is again the area with the highest worker turnover, but compared especially to the North-East.

Women and the youngest show a highest worker turnover compared to men and the other age groups, respectively, with the partial exception of the 55-64 age brackets. This is in line with expectations. The youngest have typically more career interruptions with respect to more mature workers. The eldest, instead, are more involved in the transitions to pre-retirement and retirement.

The probability of worker turnover reduces with education and, as expected and shown also by other studies (e.g. Naticchioni et. Al, 2006), with firm sizes.

Finally, worker turnover decreases for part time workers and increases for temporary workers. Since a large share of part time contracts are permanent (82.56% of part time workers in our sample have a permanent contract) it is reasonable to find a reduced turnover for such a kind of workers. Temporary workers, as expected, do show a high turnover.

To sum up, we find evidence supporting H1 in all the considered years. We indeed find the highest turnover rates in the traditionally high unemployment regions of the South of Italy.

The worker turnover differs substantially among the Italian regions. It is highest in the South of Italy. Women, youngest, and less educated employees do show the highest turnover. This latter is also associated to temporary work contracts and small firm size.

6. Conclusions

The empirical analysis of this paper builds on a theoretical model by Aghion and Blanchard (1994). The previous literature brings to the fore different hypotheses as to the link between local labour market dynamics – as proxied by the turnover rate – and the unemployment rate. The theoretical framework as well as the empirical analyses are consistent with predictions in favour of positive, negative and virtually no relationship between these variables.

In this paper an attempt was made to quantitatively verify the empirical pattern linking the labour market turnover and the unemployment rate using a rich dataset encompassing the period 2004-2011. We find a statistically significant and economically large positive estimator on turnover as a whole as well as its components, inflows and outflows. We find that turnover, as well as inflows and outflows separately, are *ceteris paribus* positively related to the unemployment level. This general conclusion is robust to the use of different panel estimators. We also find that elasticity is larger in the case of the inflow rate than for the outflow rate.

In addition, the worker turnover differs substantially among the Italian regions. It is highest in the South of Italy. Our findings do suggest that women, youngest, and less educated employees do show the highest turnover. This latter is also associated to temporary work contracts and small firm size.

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Tables and Figures

Table 1. Summary statistics for our sample of Employees (2004-2010)

	Mean	Std. Dev
Turnover	.135	.342
Male	.556	.497
<i>Age</i>		
[15-24]	.091	.287
[25-34]	.226	.418
[35-44]	.312	.463
[45-54]	.274	.446
[55-64]	.097	.296
<i>Education</i>		
None, elementary or lower secondary	.472	.499
Upper secondary	.382	.486
Post secondary or tertiary	.145	.352
Bluecollar	.418	.493
<i>Firm size (# employees)</i>		
Undefined	.077	.266
[0-15]	.357	.479
[16-49]	.236	.425
[50-250)	.211	.408
[250 over)	.119	.324
<i>Area of residence</i>		
North-West	.278	.448
North-East	.231	.422
Centre	.160	.366
South	.331	.470
Part time worker	.172	.377
Temporary contract	.110	.313
<i>Time dummies</i>		
Year 2004	.150	.356
Year 2005	.150	.357
Year 2006	.137	.344
Year 2007	.144	.351
Year 2008	.146	.353
Year 2009	.134	.341
Year 2010	.139	.346
Observations	150,508	

*Note: We report the average values of mean and st.dev for the period 2004-2010.
Source: our elaborations on Italian Labor force survey data.*

Table 2. Gross worker turnover, accession and separation rates according to regions, 2004-2010

	Turnover	Accession rate	Separation rate
2004-2005			
North-west	45.34	26.27	18.97
North-east	38.62	20.39	18.23
Centre	53.83	29.37	24.46
South	53.98	10.67	43.31
Italy	59.41	32.49	26.92
2005-2006			
North-west	40.65	22.56	18.09
North-east	36.72	21.12	15.60
Centre	53.83	32.51	21.32
South	51.64	12.18	39.46
Italy	57.63	33.32	24.31
2006-2007			
North-west	35.03	21.92	13.11
North-east	40.59	22.67	17.92
Centre	53.89	29.62	24.27
South	40.19	10.43	29.76
Italy	50.41	29.23	21.18
2007-2008			
North-west	38.64	21.53	17.11
North-east	38.02	21.75	16.27
Centre	45.55	26.17	19.38
South	44.08	11.13	32.95
Italy	49.73	27.85	21.80
2008-2009			
North-west	41.60	17.07	24.53
North-east	39.41	17.77	21.64
Centre	55.40	25.18	30.22
South	53.17	10.98	42.19
Italy	57.46	27.46	30.00
2009-2010			
North-west	49.85	23.46	26.39
North-east	42.46	20.29	22.17
Centre	57.11	27.02	30.09
South	50.05	10.13	39.92
Italy	56.99	27.02	29.97

Source: our elaborations on Italian Labor force survey data.

Table 3. Logit estimates on the probability of turnover, only regions turnover

	Coef.
northwest	-0.73***
northeast	-0.69***
centre	-0.50***
_cons	-1.45***

N = 150508

*Note: * p<.1; ** p<.05; *** p<.01.*

Source: our elaborations on Italian Labor force survey data..

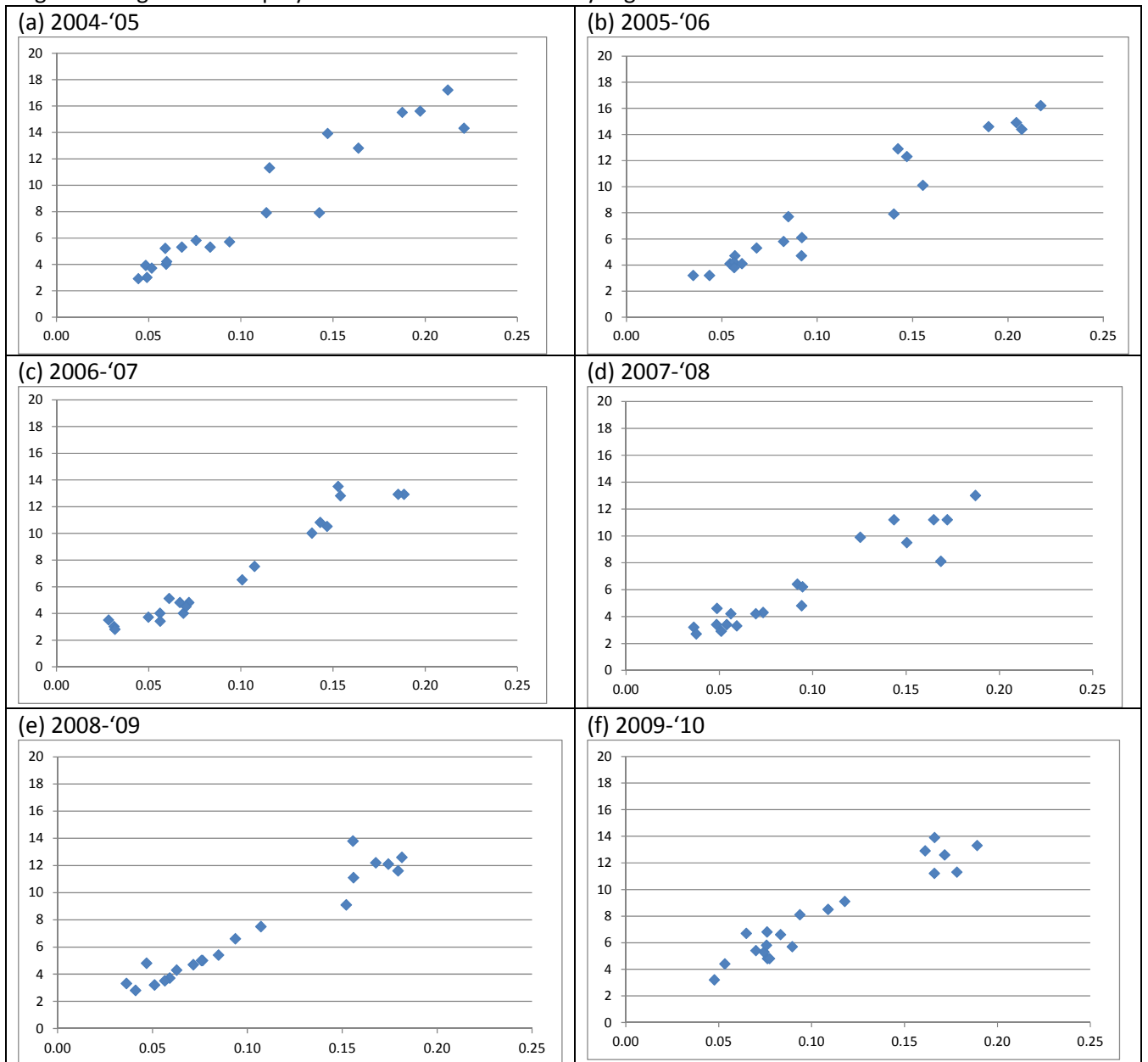
Table 4. The determinants of turnover (2004-'11), pooled estimates

Turnover	Coef.	Std. Err	z	P>z
Male	-0.77	0.02	-35.01	0.00
<i>Age – Reference: [15-24]</i>				
[25-34]	-0.57	0.03	-17.02	0.00
[35-44]	-1.00	0.03	-29.00	0.00
[45-54]	-0.91	0.04	-25.25	0.00
[55-64]	0.67	0.04	17.74	0.00
<i>Education- Reference: Post secondary or tertiary</i>				
None, elementary or lower secondary	0.37	0.04	0.41	0.00
Upper secondary	0.20	0.04	0.23	0.00
Bluecollar	0.78	0.02	31.50	0.00
<i>Firm size – Reference: Undefined</i>				
[0-15]	-4.01	0.03	-115.55	0.00
[16-49]	-4.38	0.04	-113.54	0.00
[50-250)	-4.54	0.04	-109.68	0.00
[250 over)	-4.55	0.05	-94.58	0.00
<i>Area of residence – Reference: South</i>				
Northwest	-0.59	0.03	-22.16	0.00
Northeast	-0.60	0.03	-21.47	0.00
Centre	-0.46	0.03	-15.29	0.00
Part time worker	-1.06	0.03	-30.72	0.00
Temporary contract	1.23	0.03	47.64	0.00
<i>Time dummies</i>				
Year 2005	-0.05	0.04	-1.35	0.18
Year 2006	-0.09	0.04	-2.40	0.02
Year 2007	0.01	0.04	0.01	0.86
Year 2008	0.05	0.04	0.07	0.14
Year 2009	0.16	0.04	0.18	0.00
Year 2010	0.06	0.04	1.70	0.09
Constant	2.27	0.06	39.11	0.00
Observations	150,508			

Note: * $p < .1$; ** $p < .05$; *** $p < .01$.

Source: our elaborations on Italian Labor force survey data.

Figure 1. Regional unemployment and labour turnover by region



Source: our elaborations on Italian Labor force survey data.