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ABSTRACT

Explaining Non-Employment Magnitude and Duration: The Case of Italy¹

In the past 25 years a vast number of Italian workers have become jobless for long periods of time, often dropping out of the labor market and becoming long-term inactives for the rest of their life. This process has long roots in the past and has been fuelled by Italy's poor economic performance. We intend to analyse its nature and derive policy implications for the years to come. We estimate long-term non-employment and its duration by means of Italian longitudinal databases of administrative origin. Long-term non-employment of men stands at 1.6 million individuals in 2012, about the size of male official unemployment, its average duration exceeding 14 years. We present a micro-econometric exploration of the underlying process. The main driving element works via a substitution effect: the relative cost of new entrants vs. that of retaining individuals already on-the-job has often been too high and widely responsible for such developments as it provides the employers with an incentive to layoff and fill the vacancy with a new entrant. Additional explanation is provided by the wide utilization of temporary and flexible contracts and by reasonable proxies of individual characteristics. Our conclusions indicate important drawbacks in the strategy advocated for many years by the EU Commission to promote youth employment.

JEL Classification: J08, J11, J64, J68

Keywords: inactivity, long run consequences of unemployment/non employment

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I. Introduction

Italy's labour market suffers from a serious pathology, in addition to the increasing precariousness and unemployment of the young workforce common to all EU member countries: flows from regular employment to non-employment are often dead-ends and the magnitude of long-term non-employment is dramatic. A vast number of individuals who lose their job shortly after their first hire enter the ranks of the unemployed or leave the workforce altogether, never to regain regular employment for many years, at times for the rest of their life. Many may join the ranks of the irregular economy.

The issue of the effective length of unemployment/non-employment spells has been seldom documented in the literature despite the gravity of its long run consequences: changes of individual lifestyles, family and childbearing projects, increasing poverty and welfare at large.

We intend to analyse the nature of this process and derive policy implications leading to measures that could be implemented by Italian policy makers in the years to come.

Permanent and premature exit from the labor market² has been the object of estimation in few countries: Italy in first place (2003, 2007 and 2013), and more recently Spain and Germany (2014)³: in Italy we observe a time-window of 25 years (1987-2012) and find that out of 100 men aged 19-30 at the start of their working careers in 1987 only 77% "survive" in the regular labour market by 2012. In this paper we present the Italian case, with an econometric exploration on the factors that explain its short-medium run development between the late 80's and the early 2000's. The lack of micro-data for an appropriate counterfactual of the expansionary periods of the mid Seventies makes our analysis unfit for a long run in-depth exploration. Ultimately, these developments date back to the recession of the mid 80's and of the prolonged stagnation of the Italian economy that followed⁴.

The main driving mechanism of the process of premature exit from the labor market is the relative cost of retaining young employees already at work vs. that of replacing them with new unexperienced ones. If the retaining cost is too high the employee will be dismissed and a new one hired in his place. The problem is that often such dismissals lead to premature exits from the labour market and, possibly, to lifelong non-employment. The replace/retain hypothesis appears to be soundly confirmed in our econometric analysis.

The paper is organized as follows: sect. 2 illustrates the main aspects of Italy's labour market and its development. Sect.3 provides a short survey of the relevant literature. Sect. 4 describes the WHIP database and the survival methodology used to measure long-term non-employment (LTNE) and its duration. In sect. 5 the main empirical estimates of long-term non-employment are presented. The pieces of the puzzle and the econometric exploration are assembled together in sect. 6., Sect.7 illustrates comparisons with different and official data sources: in sect. 7.1 we explore the extent to which LTNE workers may have joined the irregular economy; in section 7.2 we summarize the results of a comparative exploration with the European Household Community Panel. Conclusions follow in sect. 8.

² "Workforce disposal" was my preferred denomination of this process (Contini, 2003): But some colleagues suggested that "disposal" sounded too derogatory towards the employers. I am, unwillingly, following their advise, and from now on the process will be referred as "permanent and premature exit from the labor market".

³ B. Contini, I. Garcia Perez and T. Pusch, "New approaches to the study of long-term non-employment duration: Italy, Germany and Spain", unpublished script (2014).

⁴ A reasonable, but too naïve an explanation emphasizing the need for a strong economic recovery capable to slow down and reverse the trend, is not helpful advise for policy makers.

2 Italy's labour market

2.1 Recent and less recent developments

Italy's unemployment rate hovered around 7-9% from the mid 90s to 2007, rapidly increasing thereafter above 12%. In the early 2000's youth unemployment was about 20%, the second highest in the European Union, and hiked to 40% and over in 2013. Youth employment had steadily increased from 4.0 million in 1968 to slightly less than 5.0 million in 1990, a consequence of the baby boom and of the increased participation of young women. However, prior to the 1993 recession and in the aftermath of the baby boom, the trend had already sharply reversed, and as of 2008 only 3.4 million young people were in employment. The youth participation rate steadily dropped from 45% of the Eighties to 27% in 2013. Since the turn of the millennium Italy was outperformed by all the main EU countries, facing a drastic reversal of all its main macroeconomic indicators.

According to ISTAT (National Statistical Institute) overall unemployment reached 2 million individuals at the eve of the 2008 recession, while both the inactives ("willing to work") and the irregular workers exceeded 3 million. The EU-LFS (Labour Force Survey) reported important comparative data for 2011: Italy's share of "inactives but willing to work" was almost three times the EU average and far above all the larger EU countries, including Spain whose unemployment rate was much higher than Italy's. Many of the inactives are presumably discouraged unemployed who have had regular working activities in the past. Many may be working part or full time in the irregular economy. The size of Italy's rate of inactivity is also a consequence of the historical downward trend of male participation. But, in this respect, Italy has not fared differently from many EU member countries.⁵

Tab. 1 -OECD: Main growth indicators and multifactor productivity (MFP) 2000-2008:

	Employment	GDP constant prices	Fixed capital investment	Labour productivity	MFP 1985 -95	MFP 1995	MFP 2000 2007
Italy	10.3	7.3	- 0.36	- 3.0	1.3	0.1	- 0.7
France	5.8	14.1	1.75	+ 8.3	1.7	2.1	1.0
Germany	6.0	9.7	0.67	+ 3.7	1.4	1.1	0.6
Spain	29.9	28.0	0.83	- 1.9	n.d.	0.1	- 0.1
U.K.	8.5	20.4b	0.83	+ 11.9	1.0	1.2	1.2

⁵ An additional, though untested, explanation for the Italian OLF-exception lies in the fact that only a small fraction of Italy's working population is eligible for unemployment benefits: Italy's recipiency rate is 32%, against 50% of the UK, 60% of France, 65% of Denmark, 73% of Spain, 94 of Austria and 100% of Germany. (OECD Database 2013). In Italy there is little incentive to self-report one's true employment status in the LFS, because the opportunity cost is often close to zero. Where unemployment benefits are generously available, as in Germany (and Austria), the opportunity cost of misreporting is high because the risk of losing the benefits is high as well.

Tab. 2 . Unemployment and out-of-labour force in selected EU countries (2011).

	Unemployed 2010 (000)	Unempl. rate 2010	OLF- not searching, but willing to work	OLF 2010	Rate (M+F) 2010	Empl. rate 2010 (M)	Empl. rate 2010 (F)	Youth unempl. 2010 (15-24)
Italy	2102	8.4	2764	11.6	56.9	46.1		27.9
France	2653	9.4	309	1.1	64.0	59.9		22.5
Germany	2946	7.1	530	1.3	71.2	66.1		9.7
UK	2440	7.8	837	2.7	70.3	65.3		19.1
Spain	4632	20.1	973	4.2	59.4	53.0		41.6
EU	22906	9.6	8250	3.5				

Source: ISTAT, Rapporto sulla coesione sociale 2013.

The first measures aimed at increasing employment opportunities for the young were implemented at the end of the 70s, with a generous tax exemption scheme in place in Southern Italy (phased out in the mid 90s), and the so-called CFL (training-and work contract) of 1991 aimed at young people below age 30. In 1996 the Treu Reform Package completed the liberalization of temporary contracts and introduced forms of contract work (referred to as “co.co.co.” contracts), *de-facto* disguised dependent work, exempt from firing costs and subject to very low social security contributions. The latter left workers almost completely unsheltered from any form of welfare coverage. In 2000-2001 the implementation of two EU directives on part-time work and on fixed-term contracts added new elements of flexibility to the system. The share of non-standard contracts, relatively stable around 50% till the mid 90's, picked up after the Treu Reform Package, reaching 65% of all initial hires in 2000, and over 70% by 2008. The Treu legislation merely sanctioned and legalized practices that were already widely used.

The process leading to the premature and definitive workforce exit from the labor market was already under way during the 70s when the Italian economy was still faring relatively well, and continued through the cyclical downturn of the 90s. The long stagnation of the Italian economy documented in tab.1 is undoubtedly one of the main determinants of its progressive development.⁶ Even more importantly, the reforms advocated by the EU Commission in the last 20 years, aimed at enhancing youth employment opportunities, often provided employers with incentives for pursuing the strategy of worker turnover and quick replacement, both direct causes of premature exit in absence or near-absence of appropriate active measures of re-training and guidance.

An overview of Italy's labour market is not complete without mentioning the irregular/parallel/ hidden economy. Based on a variety of coarse macroeconomic indicators, ISTAT puts the number of irregular workers in 2009 at about 3 million, 2 million of which completely submerged and 1 million double-job holders. The large majority of double-job holders are men, while the fully irregular women are about one half the number of men. In addition, about half of the young school leavers (15-24) searching for their first job may also be active at least part time in the unobserved economy. “Worker disposal” appears to be one of the

⁶ LFS transition probabilities from non-employment to employment dropped from well above 8% in the early 80s to about 5% at the beginning of the millennium. Similarly, those from unemployment to employment decreased from 27% to 18% (B. Contini and U.Trivellato, 2005). These are clear indicators of the long run deterioration of the labor market. Also data on gross and net job turnover (GJT and NWT) released in the mid Seventies showed patterns similar to the ones prevailing twenty years later, before the start of new long lasting recession.

main feeders of Italy's pool of inactive people and of irregular workers: the magnitude of our estimates is compatible with this claim.

3. A short overview of literature⁷

The relevance of countless studies on the consequences of long-term unemployment is modest as the official (and accepted) definition of "long-term unemployment" – 12 months and over by OECD and Eurostat, and only 27 weeks + in the USA - is much more restrictive than our approach suggests to be appropriate. As previously mentioned, we find 1.6 million people in working age to be non-employed for as long as 30 years, average non-employment duration exceeding 14 years.

The vast majority of academic studies on long-term unemployment deal with the issue of deteriorating employability as joblessness persists due to obsolescence of human capital, stigma and signalling of "bad" performance, all of which result in wage loss at the time of re-employment (Blanchard and Summers, 1989; Layard and Nickell, 1987; Machin and Manning, 1999; Arampulam 2000; Guell and Petrongolo 2007). The negative relation between the duration of joblessness and the probability of being rehired is an important and relevant issue: Torelli and Trivellato (1989) study youth unemployment duration in Italy, confirming state dependence; their results are replicated by Addison, Centeno and Portugal (2004). Some years before Van den Berg and Van Ours (1994 and 1996) had indicated that state dependence persists also when selection issues related to workers' heterogeneity are included in the analysis. According to Machin and Manning (1999), instead, state dependence and workers' heterogeneity cannot be identified separately without untenable assumptions. Very recently K. Abraham, J. Haltiwanger et al. (2016) address the same issue in the analysis of U.S. unemployment during the 2007-2009 recession: they control for heterogeneity using information on individual employment experiences prior to becoming unemployed, but find that unemployment duration is strongly duration dependent and reject the "bad apple" (heterogeneity) explanation.

The issue of the effective length of unemployment/non-employment spells is instead seldom documented. The work of A.L. Krueger (2015) provides an important perspective on unemployment duration. While not denying the well known issues of skill obsolescence and discrimination on the part of the employers, Krueger strongly emphasizes the social problems associated to very long non-employment duration: changes of individual lifestyles, family and childbearing projects, increasing poverty and welfare at large. Studies on the dualization of the labour market are also relevant for this paper, and more affine to Krueger's recent work. Warnings about the very long-run dangers of dualization were launched by O. Blanchard and Landier (2001), O. Blanchard (2006) and G. Saint_Paul (2004): while the *insider* workers with permanent open-end contracts are sheltered by the welfare institutions, the protection afforded to the *outsiders* is almost nil. Persistent dualization may undermine cohesion, lead to social dumping and political unrest. An important paper by Von Wachter and Song (2014) analyzes the cyclical properties of long-term non-employment in USA: spells as long as 5 years count up to 3,5% of all unemployment spells, peaking during recessions and after 2007. There are few additional and relevant contributions: Mroz and Savage (2006) report re-employment probabilities for US youth who experienced unemployment spells of 10 years or more. Evidence of the same order of magnitude is provided by P. Gomes (2012) in his study on the UK. Mussida and Sciulli (2015) explore the

⁷ We will not report here country-studies that document a positive, although modest frequency of transformations of temporary contracts into open-end contracts: Berton, F., F.Devicienti, L.Pacelli, (2011); Berton, F., Richiardi, M. and Sacchi, S. (2012); Bonnal, L., Fougere, D. and Serandon, A. (1997); Booth, A., Francesconi, M. and Frank, J. (2002); Bover,O. and Gomez, R. (2004); D'Addio, A.C. and Rosholm, M. (2005); Dolado, J.J., Garcia-Serrano, C. and Jimeno, J.F. (2002); Ichino, A., Mealli, F. and Nannicini, T. (2008); Picchio, M. (2008).

Italian case and provide estimates of re-employment probabilities after layoff which are consistent with our findings.

4. The measurement of long-term non-employment (LTNE)

4.1 – The WHIP database

Estimation of long-term non-employment non-employment is performed using the methodology originally proposed to calculate “workforce disposal” in 2003. Our analysis uses the WHIP longitudinal database originating from Social Security records, a large sample (1:90) representative of the universe of employees of the private sector, of the non-tenured employees of the public sector, of the self-employed and the professionals, as well as all workers covered by atypical (non-standard) contracts. As of today the WHIP database covers the 1987-2012 period. The Social Security Administration has provided an additional database -Casellario degli Archivi - which integrates WHIP with the working careers of individuals who move from dependent work observed in WHIP into the tenured public sector. Education data are unrecorded in the Social Security databases. Econometric explorations are performed on the shorter 1987-2003 window as not all relevant variables are not available towards the end of the observation window. .

WHIP covers individual working careers from entry to retirement at monthly frequency, with data on skill level, wage, industrial sector, firm size and geographical location, including spells of temporary layoff subsidized by Earning Funds (C.I.G., Cassa Integrazione Guadagni) and registered unemployment (the registered unemployed are people who draw unemployment benefits, while the LFS unemployed are those who self-report as unemployed in the course of the interview). WHIP provides detailed information on workforce dynamics, job changes, composition and relative wages, while it does not identify the unemployed not eligible for benefits (about 10% of the LFS count of the unemployed). Foreign workers have been excluded from our counts as there is no information on those who return to their home country. We miss instead, at least for the time being, Italian citizens who find a job abroad and leave the country. Their number is rapidly increasing in recent years, but it was modest throughout the period of this investigation.

The WHIP database is an almost ideal instrument for the study of job matching and employment mobility (job-to-job and/or taking place after spells of non-employment, geographical and cross-sectoral). It delivers much richer detail than LFS-type data that lack long memory, and captures all employment and non-employment spells at monthly frequency⁸. While prevalent among youth, premature and definitive exit takes place at all ages, and young individuals will no longer be young as time elapses. School leavers in search of first job are instead unobservable as they enter the Social Security records only upon being officially hired. Many of those who leave the labor market become inactive by discouragement after a long time in joblessness; some are unemployed, but not eligible for unemployment benefits. Many join the irregular economy. Needless to say, those who have reached retirement age or have been forced into early retirement are not counted as premature exits.

⁸ Job spells lasting only few days may therefore be undetectable in WHIP. Especially in recent years the utilization of “contract work” has rapidly risen: workers are hired by agencies on a semi-permanent basis, and are leased on demand for jobs that may last only a few days (typical examples are waiters required for special events, actors for the few days of their engagement, nurses on call, etc.). WHIP observes the semi-permanent position with the leasing company, but fails to catch each single job spell.

The basic statistic used in this exploration is labour market survival. Our concept of survival is not the usual econometric definition. Here survival is estimated by counting the number of individuals employed since a given starting year and are still present in the database at the end of a given observation period, accounting for censoring. The non-survivors are the individuals who left regular employment and no longer reappear at work in the administrative data. If anyone is unobservable for a period of time no matter how long and then shows up again in the records, he is counted as a survivor and the missing period considered a spell of unregistered unemployment or non-employment (for instance, additional schooling periods). This procedure leads to underestimate the extent of long-term non-employment.

Survival is estimated on cells defined by cohorts of young male employees observed at one-year intervals between 1987 and 2012 along several dimensions, and after adjustment for truncation bias. We restrict analysis to male workers aged 19-30 at the time of their first job and track their careers in the regular" labour market for up to thirty years. Premature exit is very high: out of 100 new male entries at age 19-30 at the start of their careers in 1987, 89% survive in the regular labour market after 10 years, 86% after 16 years in 2003, 81% in 2009, and only 77% in 2012, 25 years after their initial career.

Here we show only a few examples of survival schedules: fig.1 shows that the timing of labour market entry reflects the impact of the business cycle: if the first hire occurs in expansionary years (1987), survival is higher than if the working career commences during recession times (1992 is the onset of a three-year downturn of the economy). Survival is higher in 1997, a short upturn after the Treu Reform, followed by a renewed fall into stagnation. Fig. 2 depicts the impact of the duration of the first employment spell. Survival of workers starting with a long initial spell of employment (12 months +) is about 83%, whereas it drops to 61% for those whose first employment spell - three times as numerous - lasted less than 3 months. Evidence of skill mismatch is present in the survival schedules despite that skills are not directly observed beyond the white-blue collar qualification: fig. 3 shows that bad starts (a short initial job duration coupled with a low initial wage), denoting persons with low initial endowments, have a strong and persistent effect on future labour market outcomes, even when the future lies 15-20 years ahead. Data on educational achievement would strengthen this result: however, evidence from Spain and Germany (B. Contini, I. Garcia Perez and T.Pusch, 2016) indicates a high correlation between low education and the two indicators above and a joint impact similar to that of fig. 3. We therefore believe that our evidence on skill mismatch is likely to resist despite the lack of educational data.

While about 80% of all entrants leave their job or are dismissed within two years since initial hire, the majority will re-enter after one or more spells of unemployment. As documented in the literature, re-entry at work after a non-employment spell is robustly state-dependent: in Italy between 45% and 60% of the people are back on a job within the first 3 years since layoff, about 10% re-enter within 7 years, and less than 5% within 10 years.

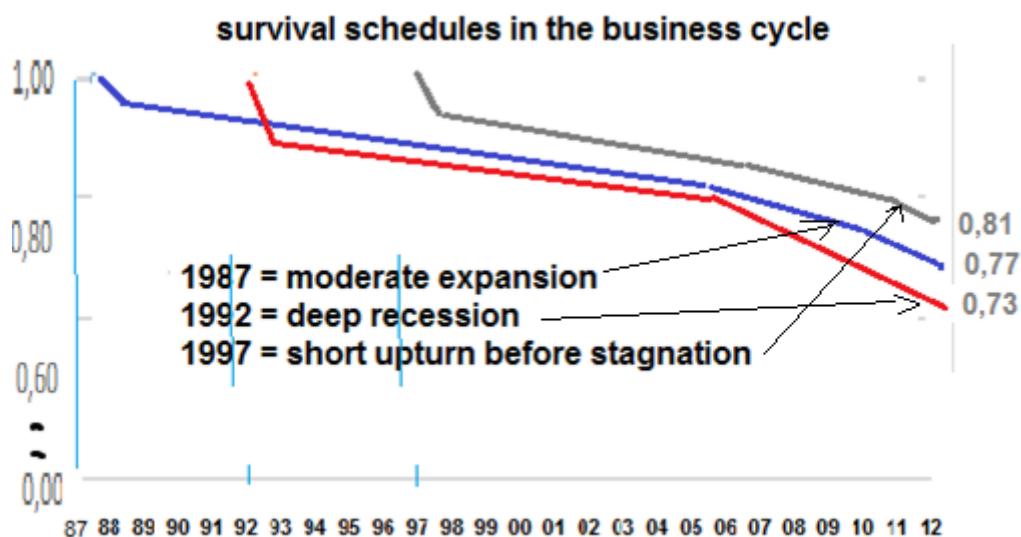


Fig. 1. Survival curves by three years of entry (1987, peak of expansion, 1992, beginning of deep recession; and 1997, short upturn before long stagnation).

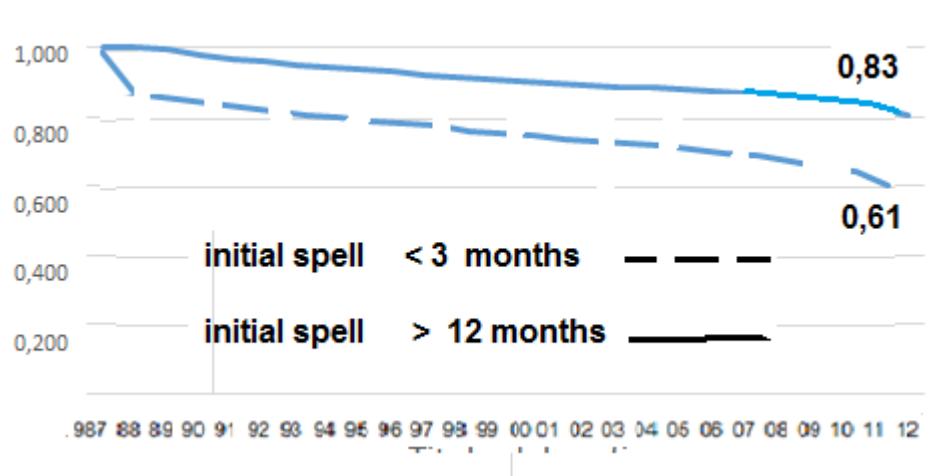


Fig.2 - Survival curves by duration of first spell.

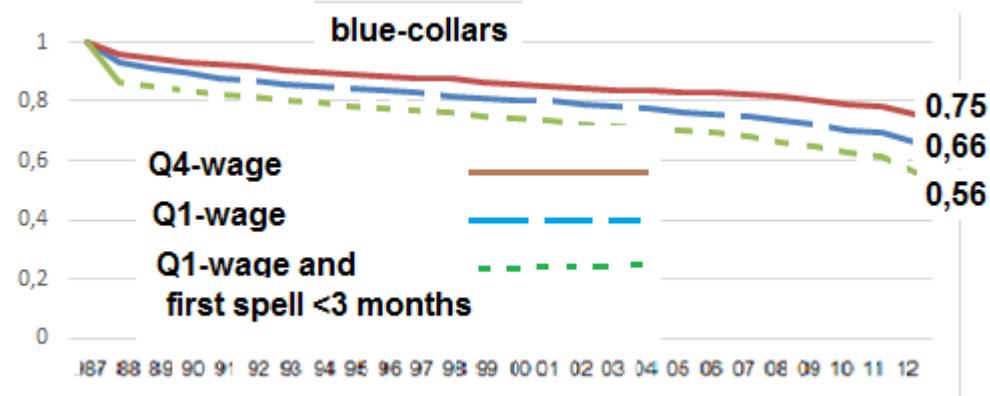


Fig.3 – Survival curves: blue-collars, by wage quartiles and first spell duration

5.2 Truncation bias

Truncation at the end of the observation period leads to upward or downward bias of survival. Hires taking place 1, 2 or even 3 years before the end of the observation window are followed by a large number of jobless spells lasting through the end of the window. They may appear as definitive exits, but many workers involved in such spells are back at work within a short time thereafter and are the cause of an upward biased estimate of survival. The database allows to observe all these cases one by one, and bias can be eliminated simply by not counting them as disposed.

Truncation may bias estimation also in the opposite direction: a number of job spells active at the end of any observation window will be terminated shortly following its end. This will downward bias survival: as in the previous case, the distortion can be eliminated by counting as disposed all such occurrences.

The proposed unbiasing procedure is somewhat arbitrary to the extent that the length of the period taken into consideration before and after the end of the observation window is selected on the basis of empirical evidence. The observed bias is roughly constant, independent of the business cycle: the unbiasing procedure increases survival by 1-2 p.p. throughout the whole observation period.

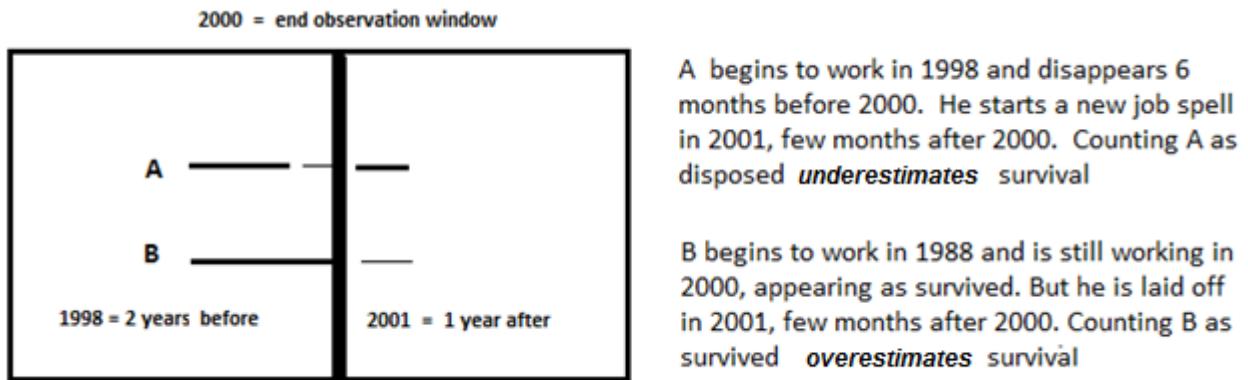


Fig. 4 - Two examples of truncation bias

5.3 The duration of long-term non-employment (LTNE)

The duration of long-term non-employment (LTNE) can be estimated directly from the survival schedules of each cohort of entrants (fig.5). Survival over a 13-years observation window is $S = 0.68$, implying that at $(t+13)$ the non-employment rate specific of that cohort is 32%. Of the 32% non-employed at $(t+13)$, a few have left the job for the full period of 13 years; 16% ($= 100-84$) for 5 years; and very few, less than 1%, for 1 year between years 12 and 13. In this example the average LTNE is approximately equal to 6.5 years.⁹

⁹ Let $s(t)$ be the downward sloping survival function. Average LTNE duration is given by:

$$\text{average LTNE} = \int_0^T t f(t) dt$$

where $f(t) = s(t) / K$ is the p.d.f. subsumed by the survival function $s(t)$. Average LTNE is a lower bound: workers who have survived through T may have had interrupted unemployment spells of any length in the course of their career, neglected by this calculation. Survival implies only that they have reappeared in the database before T.

LTNE duration is easily calculated from any empirical survival curve. An approximate estimate is one half the length of the observation period, its precision being highest when survival is a straight down-sloping schedule. When it is upward concave, the estimate of LTNE duration is downward biased.

Tab. 2 displays the average non-employment duration of 1.6 million people still in working age in 2012.¹⁰ The LTNE duration of a group of relatively aged (57-64), still alive and not yet retired individuals, reaches 25-32 years. The largest group (over 1 million people) are prime-age individuals in their late 30's, 40's and early 50's, whose LTNE duration is between 16 and 24 years. The average LTNE duration of people in their 30's is about 10 years. That of the youngest group (up to 30 years of age) between 1 and 4 years.

The number of LTNE individuals is a frightful 8.6% of the male population in working age (16-65), and 11.1% of the male labor force, slightly below the official unemployment rate. Notice, however, that while the business cycle has a direct impact on unemployment, the same does not hold for the LTNE which is a more stable structural indicator. The LTNE duration of all disposed individuals is 14.2 years. This order of magnitude is almost twice as high as that obtained from the ISTAT-LFS (2012) estimate of the annual transition probability from unemployment/non-employment to employment in 2008, equal to 0.12.¹¹



Fig. 5 Survival and “long-term-non-employment” duration (LTNE).

¹⁰ Many workers aged 60+ (but not yet in retirement age) are unobserved in our data as their labour market entry is prior to 1986: their LTNE is estimated under the reasonable assumption that worker disposal between the mid 70's and 80's may have been less intense than in years that followed.

¹¹ Under reasonable statistical hypotheses the expected duration of non-employment is given by $1/0.12 = 8.5$ years, which is of the same order of magnitude as that reported by P. Gomes for the UK(2012).

Long-time non-employment (LTNE) in 2012

age	LTNE duration years	LTNE magnitude (000)	by comparison		
57-64	25-32	170	LTNE (000)	duration LTNE / male w-pop	
46-56	21-24	459	GERMANY	623	16,7 yrs
34-51	16-20	522	SPAIN	1293	14,7 yrs
22-35	10-15	255			2,6%
24-36	5-9	112			8,6%
16-27	0-4	112			
<i>all</i>	<i>14,2</i>	<i>1608</i>			
<i>LTNE / male working population in working age = 8,6%</i>					
<i>LTNE / male labor force = 11,1%</i>					
<i>Unemployment rate 2012 = 12%</i>					

Tab. 3 - Long-time non-employment (LTNE)

6 Explaining the puzzle

6.1 The determinants of survival

Economic theory suggests that low productivity is the cause of early job termination: low productivity workers may be expected to re-enter the labour market sometime after job loss, eventually after a period of re-training. In Italy two thirds of all hires aged 19-30 leave their first job within two years since entry, about 40% are back at work within 4 years, and almost 40% within 8 years. The big problem rests in the remaining ones who disappear altogether from the labor market at relatively young age and will never return to a regular working life.

While in the long run the process of premature definitive exit is directly affected by general labor market conditions and macroeconomic factors, the focus of this explanation is its short-medium run determinants. Our aim is to explore the process in order to derive measures that could be implemented by Italian policy makers in the years to come. Claiming that a strong economic recovery could slow down and probably reverse the trend, is a reasonable but naïve statement, certainly not helpful advise for policy makers.

Labor costs affect the quantity as well as the quality and mix of labour market entrants. The main impact comes about through a substitution effect: retaining a worker at the end of a short (1- 2 yrs) employment spell is often more expensive than replacing him with a new unexperienced candidate. The retaining option implies the employer's positive evaluation of the know-how acquired by the employee in the course of his experience on the job, and reduces the exit probability. The replacing option increases worker turnover, as well as the probability of market exit with no return.

Flexibility is an indirect component of labour cost via a variety of composite factors: strict or loose hiring and firing rules, contract typologies regulating pay, working hours, overtime, holidays and night shifts. Its impact on premature exit may pull in opposite directions: on the

one hand, high flexibility increases the employers' incentive to make use of turnover, accelerating disposal and leading to a shorter survival. On the other hand a high degree of contract flexibility with costless dismissal – *de facto* a reduction of labour cost - could have a positive impact on the hiring rate and reduce the premature exits. A sound empirical test of flexibility cannot be performed as the mere number of contract typologies defies measurement (in the early 2000's ISTAT counted 42 different typologies). A rough aggregate indicator based on the observed frequency of short term contracts on all new hires is used here as a proxy of flexibility.

Additional factors affecting survival are mobility and labour market tightness. Mobility reflects geographical mobility across jobs and regions, and in most cases it catches local or quasi-local switches. Empirical evidence suggests that mobility is pro-cyclical: with tight markets and high worker turnover the frequency of successful matches between labour demand and supply is high, and opportunities for successful job search arise, reducing the risk of disposal and increasing survival. Under slack markets the risk of prolonged joblessness is larger, and survival will be lower. In this exploration mobility is measured by a 0-1 dummy activated only once, at the time of the first job change.¹²

Labour market tightness can be measured by worker turnover. Gross and net measures of worker turnover may be equally appropriate: our choice goes to the pro-cyclical net worker turnover rate ($NWT = [\text{associations} - \text{separations}] / \text{employment stock}$) as it loosely matches the ups-and-downs of the business cycle.

Individual ability has an obvious important role in the explanation of survival. As already mentioned, ability and skills are unobservable in the WHIP database beyond the white-collar / blue-collar distinction. But factors like initial pay and the duration of a new entrant's first job reflect individual characteristics as perceived by the employers.

Geographical differences and firm size deliver additional insight. The industrial structure of Southern Italy is more fragmented and based on small firms than in the rest of the country, providing a fertile ground for tax evasion and illegal labour practices. Sanctions are difficult to impose and the irregular economy is more pervasive. Therefore additional "legally recognized" flexibility of the labour market is likely to be less valued in the South than in the rest of the country, and by small firms compared to larger ones: labour costs lose importance due to the availability of illegal or semi-illegal practices (pay-under-the-table, tax evasion, free layoffs). The differential impact is tested via interaction dummies between labour cost, the white-collars, the South and firm size. Cohort dummies corresponding to the year of new entrants are also introduced in the r.h.s. aimed at accounting for the changing size of each cohort and the timing on labour market entry.

6.2 Econometric explorations and discussion

We estimate the following reduced form equation of the exit probability = hazard function (survival= 1 – hazard function):

$$\text{HAZARD}(i,t) = k_1 + \alpha_1 \text{MED-RATIO}(i,t) + \alpha_2 \text{LCOST}(i,t) + \beta_1 \text{FLEX}(t) + \eta_1 \text{DUR}(i) + \lambda_1 \text{MOB}(i,t) + \theta_1 \text{COHORT-YR}(i) + \mu_1 \text{NWT}(t) + \delta_1 \text{GEO}(i) + \zeta_1 \text{AGE}(i,t) + z_1 \text{SKILL}(i) + \varphi_1 [\text{INITIAL-WAGE}](i) + \omega_1 \text{GNP}(t) + \text{MED-RATIO*interactions} + u_1(i,t)$$

¹² Multiple spell analysis would be appropriate if the focus of the study were the in-and-outs across jobs. In this exploration the focus is final survival. Moreover multiple spell analysis would complicate the econometrics without any substantial gain: simple empirical explorations indicate that the differential impact on survival of a "one-time-for-all" measure of mobility as performed here and one including multiple in-and-outs is almost negligible.

. The hazard function (1) is the complement of survival. Hiring and firing decisions are driven by the employers' *ex-ante* expectations of the cost of a new hire against the retention cost of workers already on the job. While the retention cost of an employee is precisely known by the employer, the cost of a new hire is not known *a priori* as employers will explore the market in order to find the appropriate candidate. A reasonable proxy of the perspective cost in year (t) is the median of the distribution of labour costs of all the new initial hires of given age, skill group, industry, geographical location and firm size (18 cells). We calculate the group medians of the real labour costs distributions (wage and social security contributions) for each year in the 1990-2003 window. Then, for each of the 18 cells, we compute the following median ratio

$\text{MED-RATIO}(i,t) = \text{median labour cost of a new entrant at } (t) / \text{labour cost at } (t) \text{ of retaining the } i\text{-th worker hired at } (t-1) \text{ or before.}$

1 - SURV(i,t)	hazard function (exit probability, complement of survival)
LCOST(i, t)	labour cost (growth rate)
FLEX(t)	labour market flexibility
DUR(i)	duration of first job spell (one dummy for each of three spell lenght) a
MOB(i, t)	mobility (a dummy 0,1 activated at the first job switch)
MFG(i)	manufacturing vs. services at entry (dummy)
AGE(i)	age at entry (one dummy for each of three age groups)
GEO(i)	geography at entry (one dummy for each of three regional groups)
SIZE(i)	firm size (one dummy for each of three size groups)
SKILL(i)	skill level at entrance: white vs. blue collars (dummy)
MED-RATIO (i,t)	median labour cost of new entrants at (t) / labour cost of retaining the i -th worker previously hired
W_INITIAL(i)	initial wage
COHORT-YR(i)	year of each worker's first entry in labour market (dummy)
NWT(t)	labour market TIGHTNESS measured by NWT= net worker turnover rate (macro variable, region-specific)
GNP(t)	GNP growth rate (macro variable for each of three regions)

Tab. 4- Variable denomination

MED-RATIO(i,t) could be > 1 or < 1 . MED-RATIO(i,t) < 1 indicates that the median labour cost of a new hire is smaller than the cost of retention, an event that may induce employers to layoff a previously hired individual and rehire a new one. The employers' option depends, however, also on the time elapsed since the employee's first hire: it is, presumably, an easier decision if the hire is relatively recent, and more difficult if the employee has been on the job for a long time. In order to catch these potential differences we introduce three versions of MED-RATIO:

- MED-RATIO-1 if the hire occurred less than 3 years before the decision to replace or retain;
- MED-RATIO-2 if the hire occurred between 3 and 6 years before the decision;
- MED-RATIO-3 if the hire occurred more than 6 years before the decision.

Furthermore, the MED-RATIO covariates are interacted with dummies that catch the potential difference between skill levels (blue vs. white collars), firm size (small vs. all others) and geographical location (South vs. North).

An estimated hazard > 1 implies that the smaller MED-RATIO (i.e. the cheaper the new hire compared to retention), the larger the probability of exit (and the lower the probability of survival).

The HAZARD ($= 1 - \text{SURV}$) specification includes all the covariates that describe the individual workers' characteristics [AGE, SKILL, DUR, INITIAL-WAGE], those of their employers' (MFG, SIZE, GEO), as well potentially informative macro variables (FLEX, NWT, GNP) aimed at capturing the impact of the business cycle.

The model is estimated as a Cox proportional hazard model. The hazard ratios are computed according to the formula $\text{HR} = \exp[\sum b^*(x-x^*)]$ where b^* are the maximum-likelihood estimates of

$$h(t|X) = h(t) \exp(X_1 b_1 + \dots + X_p b_p)$$

$h(t)$ is the (usually unknown) benchmark probability¹³, and x^* are the predicted values of the covariates for which the (relative) exit probabilities are estimated.

Tab. 5 - The $(1 - \text{SURV})$ equation = hazard function (^)

	hazard ratios	
White-collars	3.31	***
Manufacturing	0.83	***
North	2.48	***
Centre	2.82	***
First job dur. 3-12 months	0.82	*
First job dur. 12 + months	0.71	***
Age	1.04	***
Mobility	0.056	****
Labour cost change	1	n.s.
MED-RATIO-1	693	****
MED-RATIO-2	1082	****
MED-RATIO-3	139	****
MED-RATIO-1*white	1.82	**
MED-RATIO-2*white	2.28	**
MED-RATIO-3*white	0.81	n.s.
MED-RATIO-1*small	0.95	n.s.
MED-RATIO-2*small	0.95	n.s.
MED-RATIO-3*small	1.20	**
Flexibility	0.012	***
Likelihood ratio	- 31784	

¹³ Recall that, unless the complete parametrization of the survival function is known (and estimable), Cox regression methods do not provide estimates of the benchmark exit probability, but only hazard ratios indicating the distance from the benchmark.

(^) Non significant covariates are excluded from this table: (i) wage-initial; (ii) cohort-dummies; (iii) GNP; NWT.

(****) significance 0,001; (***) significance 0,01; (**) significance 0,05, (*) significance 0,10.

Tab. 6 - The predicted impact of deviations from the benchmark of the main explanatory variables on the exit probability

(i) Replacement / retention labor cost MED-RATIO * all workers:

MED-RATIO 1 - hire occurred less than 3 years after entry: a reduction of 1 st.dev. increases the exit probability by 1,9%;

MED-RATIO 2 - hire occurred between 3 and 6 years after entry: a reduction of 1 st.dev. increases the exit probability by 1,8%;

MED-RATIO 3 - hire occurred more than 6 years after entry: a reduction of 1 st.dev. increases the exit probability by 2,5%.

(ii) Replacement / retention labor cost MED-RATIO *white collars:

MED-RATIO 1 - hire occurred less than 3 years after entry: a reduction of 1 st.dev. increases the exit probability by 29 %;

MED-RATIO 2 - hire occurred between 3 and 6 years after entry: a reduction of 1 st.dev. increases the exit probability by 18%;

MED-RATIO 3 - hire occurred more than 6 years after entry: hazard <1, but below significance.

(iii) Replacement / retention labor cost MED-RATIO * small firms:

MED-RATIO 1 - hire occurred less than 3 years after entry: hazard below significance

MED-RATIO 2 - hire occurred between 3 and 6 years after entry: hazard below significance;

MED-RATIO 3 - hire occurred more than 6 years after entry: a reduction of 0,5 st. dev. decreases the exit probability by 60%.

(iv) A 5% change of the current labor cost (LABCOST) above or below its mean value has zero impact on the exit probability;

(v) An increase of FLEX (flexibility) of 10% above its mean (about 0,65) increases the exit probability by 2,3%;

(vi) A first job duration exceeding 12 months (DUR 12+) reduces the exit probability by 34% compared to the benchmark duration of less than 3 months;

(vii) Mobility (MOVER) reduces by 56% the exit probability compared to its benchmark (STAYER);

- (viii) An increase of 10% of AGE at the time of entry above its mean (about 22 years) reduces the exit probability by 10%;
- (ix) The exit probabilities of white-collar workers is 19% higher than the blue-collars;
- (x) The exit probability of workers operating in manufacturing are 82% lower than in the services;
- (xi) The exit probability of workers operating in the North is 9% lower than in the South.

The MED-RATIO covariates (all 1-2-3 versions) yield the most interesting results. The impact of the general MED-RATIO (i) is highly significant, indicating that a reduction of 1 st.dev. leads to an increase of the exit probabilities, between 1,8% and 2,5%. The magnitude of the impact is small but confirms the hypothesis that the replacement / retention cost ratio is an important cost factor that drives survival.

The MED-RATIO interaction with white-collar employees (ii) is somewhat less significant, and indicates a stronger negative impact on survival. If a white collar's hire occurs in the first 3 years after entry, a reduction as above of the baseline MED-RATIO leads to replacement much more frequently than for a less skilled individual: the exit probability of the white-collars increases by 29% over the benchmark. If tenure is 3-6 years, the impact on the exit probability is +18%. The larger impact compared to the general case suggests that when employers deal with relatively more expensive white-collars, replacement is preferred to retention more frequently than in the standard case. Instead, with tenure above 6 years, the hazard rate, while below significance, changes sign, suggesting the possibility of a different evaluation.

The MED-RATIO interaction with small firms (iii) suggests instead an opposite response (hazard rate < 1): when tenure is above 6 years, a lower cost ratio leads to a big 60% decrease of the exit probability. Even when replacement becomes relatively less costly, the option between replacement and retention tends to be solved in favor of retention regardless of the workers' skills. The higher preference for retaining people on the job is an unequivocal sign that small employers place a larger value in human capital than larger ones. Notice that, while below significance, the negative sign of the hazard rate hints at the same response also when past tenure does not reach 6 years.

The MED-RATIO interaction with the South is, instead, below significance.

The growth rate of labor cost (LABCOST) has no impact inspite of its very high significance (hazard rate =1 with a very tight confidence interval).

The a-priori uncertainty about the impact of flexibility (FLEX) is apparently solved by the econometrics: higher flexibility leads to higher turnover, and hence to a larger exit probability.

The model includes two covariates that, to some extent, are proxy of individual characteristics: the duration of the first job spell at the beginning of one's working career and the initial wage. The latter turns out below significance, but the former is highly significant: a first spell duration exceeding 12 months reduces the exit probability by 34% compared to one shorter than 3 months. Notice that throughout the observation period the number of very short initial hires is about three time as large as those lasting more than 12 months.

The impact of mobility is clear: people willing to engage in job shopping and job switching when their position is perceived at risk survive longer than those who do not. The exit probability of the movers is about 56% lower than the stayers'.

The impact of age at the time of labor market entry is perhaps surprising: younger entrants survive less than older ones, possibly the unobserved effect of higher education and potential human capital: the exit probability of a person starting to work at age 23 is about 10% lower than that of a person starting at age 21. Age 21 is the average starting age in our sample and a 10% increase corresponds to about 2 years.

In conclusion, many covariates yield results that are reasonable and coherent with a priori theoretical assumptions. A word needs to be spent on three remaining non-significant covariates: GNP growth, NWT and cohort dummies. All are, directly or indirectly, related to the business cycle: GNP by its very definition, net worker turnover (NWT) for its (slight) procyclical nature, cohort dummies as they reflect the cohort year of entry. We estimated an alternative nested "partial model" of the (1-survival) equation excluding the time-varying covariates and tested it against the "full model".

The likelihood ratio test on the "full" vs. "partial" model

$-2 \ln(L_{21}(\text{partial}) - [-2 \ln(L_{47}(\text{full}))] = 38,9$ distributed as chi-square (47-26=21 d.f.) allows to reject at 0,01 level the null hypothesis of no explanatory power of the partial model, a very weak, although expected result. Hence, not unexpectedly, we cannot rule out that labor market survival is related to the performance of the economy at large in the short-medium run. As to the long run perspective, we reiterate the unavailability of historical micro-data necessary to perform a reliable econometric test.

7 Comparative explorations with other sources

7.1 "Where do the disposed workers end up ?"

The crucial question "where do all the long-time jobless individuals end up after premature and definitive exit?" stands waiting for an answer. Discovering their end destination is a difficult task as no specific micro-data are available to help.

Few initial doubts are easily dispelled: (i) all workers are alive in 2012; (ii) only a minority are retired as almost all entrants are too young to have reached retirement age; (iii) few workers expatriated before the 2008 crisis, although in its aftermath the number of young high-skilled expatriates has rapidly increased; (iv) foreign workers are excluded from our sample as their return to the homecountry after dismissal may bias our survival estimates.

The irregular economy is the natural candidate as end destination for many. Comparative explorations between our estimates of premature exit and ISTAT/LFS aggregates confirm that many of the long-term non-employed are active full time or part-time in the irregular sectors of the economy.¹⁴ Indirect evidence from a variety of sources allows coarse estimation of its magnitude. ISTAT put the number of irregular workers in 2009 at about 3 million, 2 million of which completely submerged and 1 million double-job holders, the latter regularly employed and working extra-time in the black.¹⁵ No breakdown by sex is

¹⁴ Reliable micro-data are nonexistent. E. Battistin and E. Rettore (2008) indicate that people who work in the irregular economy are unlikely to reveal their status in the LFS interviews for fear of being disclosed. More generally, according to these authors, the likelihood of misclassification among the unemployed, the inactives and the irregulars is always extremely high.

¹⁵ The relative weight of the black/irregular economy on Italy's GNP is estimated at 24% by ISTAT National Accounts. Alternative methods of estimation make use of different macroeconomic hypotheses. E. Schneider (2011) estimates the share of irregular activities on GNP for several OECD countries: Italy ranks among the highest at 21.5%, Spain 19.2% and Germany, among the low ones, at 13.5%. The share of irregular employment on overall employment in Italy and Spain is estimated around 16%, and a non-negligible 12.5% in Germany. See also M. Piacenza et al. (2013).

provided, but some fragile evidence (Lucifora, 2004) suggests that the large majority of double-job holders are men, while the fully irregular women are about one half the number of men. In addition, half of the young school leavers (15-24) searching for their first job may also be active in the unobserved economy. Altogether the number of men working in the irregular economy according to ISTAT is in the order of 2.0 million individuals – 12.2% of total employment - 200 thousand of which are young school leavers unobservable in the WHIP database. ISTAT provides estimates of the age distribution and of the regional presence of irregular workers. Two independent comparisons between the WHIP-based LTNE and two ISTAT statistics of different origin can be performed at this stage, both useful to establish a plausible result.

Consider the relative age distributions (tab. 7). The LFS-2010 indicates about 2,3 million male individuals “inactive but willing to work”; the WHIP long-time non-employed 1,6 million. The age distribution are almost identical in the age group 25-54; somewhat less so among the oldest 55+. Among the youngest (15-24) the large difference of 0,5 million is completely attributable to the ones with no previous work experience, unobservable in the WHIP database. A quick glance at the geographical distribution (tab. 8) is also very reassuring: our counts of LTNE individuals and the ISTAT estimates of irregular workers are very similar, certainly not a result of coincidence.

The close match between the age and geographical distributions suggest that a vast majority of LTNE individuals may have joined the irregular economy, many self-reporting in the LFS as inactive (available to work). Notice that the collective layoffs from the industrial sectors in the 80s and 90s involved mainly the blue-collars who could easily find niches in the irregular sectors (construction, maintenance, small trades and public services). No elements are available to perform statistical tests of these hypotheses.

Tab. 7 Age distribution in WHIP and LFS indicators (in 000).

Age	LTNE male workers 2012 (our estimates)	LFS survey 2010: unemployed + OLF available to take a job (male)	Average joblessness duration of WHIP LTNE workers (years)
55+	170 (*)	320	25
35-54	781	750	17
25-34	545	525	8
15-24	112	725 (**)	3
All	1605	2320	14.2

(*) The LTNE count includes individuals of age less than 66, while the LFS reports individuals without any upper limit.

(**) Inclusive of 500 thousand young male individuals in search of first job (ISTAT estimate), unobservable in the WHIP database

Tab.8-. Geographical disaggregation of two indicators in 2010 .

		North	Centre	South	Italy
LTNE	(*)	483	308	816	1605
Irregular	(**)	650	350	800	1800

(*) WHIP, our calculations

(**) ISTAT estimates

7.2 Benchmarking worker disposal with the EHCP: a short summary

The European Household Community Panel (EHCP) can be used to provide information on some of the workers' personal characteristics, unavailable in the administrative data. The EHCP data are observed between 1994 and 2001 (the final wave of EHCP, thereafter replaced by EU SILK). Here we briefly summarize the main results of this exploration. We select the EHCP survivors from the non-survivors (disposed) applying the same methodology used for our main investigation. The profiles that emerge from the EHCP indicate that the survivors are usually better off than the non-survivors on all the items related to one's wellbeing, education and past unemployment experience. In addition, the survey provides information on the typology of working contract of the participants: there are strong hints of a relatively high participation (not necessarily full-time) to the irregular economy, both among those who report to have worked in absence of any contract, and also among those who do not indicate any contract typology.

9. Policy implications

Despite the absence of an appropriate counterfactual dating back to the Seventies when the Italian economy was strongly expansionary, we signaled indirect signs that prolonged stagnation plays an important role in explaining premature exit from the labor market. Needless to say, a strong recovery of the economy would have beneficial effects also on labor market survival.

Our econometric exploration does not go beyond 2003 but specific policy implications are still valid today. Measures aimed at reducing labour costs across the board are not promising in addition to being very expensive. Instead, increasing the relative cost of replacement vs. retention would lead in the appropriate direction: recent measures (Legge Fornero 2013 and Jobs Act 2015) suggest that policy makers are aware of this problem, but the magnitude of the proposed differential is much too small to generate the desired effects.

Contract flexibility appears to have a non-negligible impact on premature exit. The result may be weakened by the fact that our aggregate measure of flexibility is unfit to capture the multiplicity of contract typologies (42 different typologies in the early 2000's!). A drastic reduction of the number of contract typologies would dissipate the legislative confusion and reduce the number of ensuing litigations as well as their associated transaction costs. Here too, some improvements could be forthcoming with the Jobs Act 2015.

This exploration suggests that movers have much higher chances of surviving than stayers. Here too, the macroeconomic implication is straightforward but not easily implemented: a strong upturn of the economy would have a positive impact on job finding rates and hence a beneficial impact on survival. A more modest policy implication is instead clear: increasing the efficiency of placement agencies (mainly by hiring new trained personnel¹⁶) would improve the likelihood of successful matching between supply and demand, reduce the risk of dropping out of the labour market and the consequent dramatic length of non-employment spells.

¹⁶ The quest for new personnel is well founded: the employment of Italy's public placement agencies is one tenth that of Germany, with France and the UK not far behind.

10. Conclusive remarks

In Italy a vast number of individuals who lose their jobs enter the ranks of the LTNE, never to regain regular employment. More than 20% of all workers entered at young age in the official economy have been permanently excluded from the labor market by the time they reach their 40s and early 50s. Average non-employment duration of almost 2 million LTNE workers is a frightful 14,2 years, with peaks of 25-30 years for people in their fifties, and 12-18 years for mature but still very healthy individuals in their forties.

The process leading to premature exit from the labor market was already under way in the Eighties. The reforms of the mid Nineties – low entry wages and high flexibility – added strength to its development. And the prolonged, negative state of the economy worsened the job crisis.

Many workers who enter long-term non-employment join the black/irregular economy; many remain long-term unemployed without drawing unemployment benefits and/or leave the workforce altogether. And the large majority are at risk of never re-entering the labour market in whatever form. This entails dramatic consequences on their lifestyles and expectations, and ultimately on family formation and delayed fertility.

This exploration suggests that at least two official estimates on the Italian labour market should be the object of important review.

- (i) A realistic estimate of Italy's unemployment rate is much higher than the official 12% – in the order of at least 8-10 p.p. - as a large number of individuals self-reporting as “inactive but available to work” are discouraged unemployed.
- (ii) Many workers, “irregular” by Italian standards, would be legal in most EU countries where regulation is less invasive and/or may be exempt from social security contributions. This is the case for low-pay, often part-time or temporary jobs in the service sectors held mainly (but not exclusively) by young people: waiters, janitors, salespeople, domestic helpers and caretakers. A vast number of these positions may be held by individuals either belonging to the pool of the long-term non-employed and/or reporting to be inactive. Hence, Italy's real employment/population rate is substantially higher than the official one based on LFS estimates (55,5% in 2013, against 64% in France and above 70% in Germany and UK).

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