A SIMULATION OF CRISIS'S EFFECTS BETWEEN GENERATIONS:

WILL THE SOCIAL SECURITY REFORM BALANCE PROTECTIONS?

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Preliminary version

Abstract

In Italy, the crisis drastically reduced employment and hours worked, with particularly serious effects on individuals with flexible work arrangements – basically young workers – given the 'duality' of the Italian labour system. The aim of this paper is to assess the role of the Italian social protection system in reducing individual income losses during the 2008-2012 economic downturn, adopting a comparative generational approach. Besides, this study aims at providing a first evaluation of the labour market reform recently introduced in Italy, by simulating the new set of rules operative from January 2013.
The paper joins in the vast debate on flexicurity, relying on literature on microsimulation models to carry out the empirical analysis. The simulation is conducted on the Italian Labour Force Survey (ILFS) that contains information on a quarterly basis about labour market status and other socio-economic characteristics (including net wages of employees) for a large sample of the Italian population. Together with the labour market events, social protection benefits are simulated by using administrative data. Results attest that social security treatments significantly reduced income losses both for workers dismissed and suspended. Compared to adult, workers with less than 35 years old are little protected by the social safety system in force up to December 2012: in the period 2008-2012 shock absorbers recovered around 28% income losses for adults and just 7% for younger workers. The social security reform recently passed by central government can slightly balance protections in an intergenerational perspective: if the reform had been already in force during the four year period 2008-2012, the new social absorbers would protect around 12% of losses in youth's wages against 30% for adult.

Introduction

In the last years the economic situation has determined one of the most severe fall in production volumes in the history of our country. The gradual recovery recorded in 2010, that lasted until the early months of 2011, was too weak to offset the effects of the recession observed in 2008-2009. The sovereign debt crisis, which started from the second half of 2011, led to a new recession that amplified vulnerabilities on a still fragile context.

The economic cycle effects on the labour market, however, were lower than expected: with different intensities, depending on territories, we observed a shift towards a lower level of employment, although more significant was the growth of unemployed people. In any case, by comparing with trends observed at international level, the labour market has shown a high level of resilience.

The social safety system had played a significant role in achieving this result. The different trends in employment and hours worked is indeed understandable, although not exclusively, with the strong increase in the use of the wage supplement (*Cassa Integrazione Guadagni*– CIG). More generally, the insurance mechanisms against the risk of job losses made it possible to contain the decreasing of income and to mitigate the relative increase in inequality.

The objective of this paper is twofold. The first is to estimate the impact of the economic crisis on labour income, through the construction of a microsimulation model able of replicating the events observed in the labour market. The results are presented in such a way as to highlight the different impact of employment crisis between generations.

The second objective is to compare the role played by the social security system in mitigating the effects on income of job loss, with two different sets of rules, through a counterfactual exercise: those in force until 2012 and, conversely, those in vigour from 1 January 2013 (after the Fornero reform).

The estimation exercise is done referring to the active population in the labour market, with the exclusion of all sources of non-labour income. The period taken into consideration is from the first quarter of 2008 until the fourth quarter of 2012. The work is organized as follows: the first section describes the social safety system, before and after the Fornero reform, the second proceeds to a brief review of some studies aimed at assessing the crisis's distributional effects and to explain, later, the methodology used in the exercise adopted in this work. The third section shows the simulation results.

1. The social protection system in Italy

The structure of social safety nets in Italy has long been criticized for the categorical nature of the protections: who is the beneficiary of the treatment depends on his age, type of contract or company, without any reference to the need nor the public financial resources available. In the absence of a universalist income support, this organization of protection results in a low overall coverage with generous treatments only for certain categories of workers (or unemployed).

Beyond the categorical eligibility requirements, the system is also characterized by a high incoherence of the legislation, which derived from the incremental logic with which it was dealt with. New tools were added marginally or the guarantees have been extended to answer to the needs of the moment without an overall design. For this reason there are anomalies difficult to interpret, such as:

- the exclusion of apprentices and managers from CIG,
- the exclusion of apprentices (but not managers) from the unemployment benefits,
- the restrictive insurance requirements for the unemployment benefit with reduced requirements (*indennità di disoccupazione a requisiti ridotti*), which instead should protect those who do not have enough work experience,
- the phase shift between the entry requirements and the extent of treatment of the mobility allowance (*indennità di mobilità*) and of the ordinary unemployment benefit (*indennità di disoccupazione ordinaria*), or
- the quasi-coincidence between the mobility allowance and the ordinary unemployment benefit, except for the characteristics of the company who dismisses the worker.

To reduce the inequities of the ordinary measures of social protection, in recent years these have undergone 'experimental' extensions or exceptions from the general rules, aimed at widening the range of beneficiaries of protection; among them, we find emergency social shock absorbers (*cassa integrazione in deroga*, *mobilità in deroga*), unemployment benefits for apprentices and severance grants for employer-coordinated freelance work. Some of these experiments were then adopted by the labour reform launched in June 2012, while the legislator tried to limit others, such as the emergency wage supplement (CIG *in deroga*), in order to enlarge the audience of the insured. Anyway, the pillars of social safety nets in Italy are basically two: the protection under ongoing employment (Tab. 1) and the protection in case of unemployment (Tab. 2).

Table 1
The protection under ongoing employment (pre-reform)

	Features of the company	Requirements for workers	Duration	Exchange replace	Maximum amount
Ordinary CIG	Industrial enterprises; cooperatives with industrial activities; additional non-industrial processing	Employees (excluding executives, trainees, home workers, co.co.pro); members of cooperatives.	Max 3 continuous months, with extensions for up to 12 months within a 24-month window	80%	€ 931 for salaries up to € 2,015 gross per month, € 1,119 for higher salaries
Extraordinary CIG (CIGS)	Companies with more than 15 employees in the industrial/construction sector, including construction and stone masonry; small businesses (if the enterprise customer in turn has made use of CIGS); services contractors, catering and cleaning services, security firms, production cooperatives and labour companies with over 50 employees in the commercial sector and travel and tourism agencies; publishing companies	Employees (excluding executives, trainees, home workers, co.co.pro); members of cooperatives with seniority of at least 90 days	Max 36 months in 5 years: up to 12 months for corporate crisis, (renewable for a further 12 months); up to 24 months for restructuring or conversion (in exceptional circumstances it may be extended twice for 12 months each); up to 12 months (renewable for a further 6 months) for bankruptcy proceedings	80%	€ 931 for salaries up to € 2,015 gross per month, € 1,119 for higher salaries
CIG *in deroga*	To all employees (including apprentices, workers with fixed-term contracts and home-workers) with at least 90 days of seniority in companies that operate in sectors and regional areas identified by specific government agreements		The duration is defined in regional agreements	80%	€ 931 for salaries up to € 2,014 gross per month, € 1,119 for higher salaries

Source: IRPET

Table 2
The system of protection in case of unemployment (pre-reform)

	Workers admitted	Requirements	Duration	Exchange replace	Amount maximum
Mobility allowance	Workers laid off by companies admitted to CIGS and firms with more than 15 dependents wishing to undertake collective dismissal procedure	Open-ended contract, with seniority of 12 months (including 6 actually worked), enrolled in the lists of mobility	12 months for workers not over 40 years, 24 months for the age class 40-49s, 36 months for over 50 years old (the duration switch to 24-36-48 months for companies located in southern regions	100% of CIGS for the first 12 months, then 80% of CIGS	€ 931for salaries up to € 2,015 gross per month, € 1,119 for higher salaries
Mobility allowance *in deroga*	All employees, including apprentices and workers with fixed-term contracts	Length of service of 12 months with the same employee (6 of which actually worked) and with income higher than € 5.000	The duration is determined by individual regional agreements	100% of CIGS for the first 12 months, then 80% of CIGS	€ 931 for salaries up to € 2,015 gross per month, € 1,119 for higher salaries
Ordinary unemployment benefit	Workers involuntarily terminated by companies with any number of employees	Insurance requirement: 1 week INPS enrolment prior to the previous two year; contribution requirement: at least 52 weeks in the last 24 months	8 months; 12 months for workers over 50 years	60% of the last gross monthly salary for the first 6 months, 50% for the 7th month, 40% from the 8th month onwards	€ 931for salaries up to € 2,015 gross per month, € 1,119 for higher salaries
Unemployment benefits reduced requirements	Workers involuntarily terminated from any number of businesses with employees who do not have the minimum contribution requirement (52 weeks)	Insurance requirement: 1 week INPS enrolment prior to the previous two year; contribution requirement: at least 78 days	Equal to the number of days worked in the previous year and for a maximum of 180 days	35% of salary for the first 120 days, and 40% thereafter	€ 931 for salaries up to € 2,015 gross per month, € 1,119 for higher salaries

Source: IRPET

1.1 The Fornero reform

After a long discussion with the social partners, on 27 June 2012, the Parliament passed the bill to reform the labour market by responding to Europe's expectations. The reform raised a heated debate about the possible effects that the new rules would produce on employment and unemployment. The stated objective of the Reform aims to adopt the declared intentions of flexicurity at European level, providing for 'measures and interventions aimed at achieving a dynamic and inclusive labour market' able to defuse the generational inequity of our social protection system and to restore consistency between labour flexibility and insurance companies.

The mediation between the government and social partners, however, has slowed the opportunity to obtain a radical discontinuity in the system; the reform makes mostly marginal changes without a radical restructuring of the labour market. One of the most obvious merits of the law, however, is the breadth of its scope, which offers a wide re-reading of the work active policies system – social welfare – in order to combine a little more exit flexibility with a little more entry rigidity. In a nutshell, there are three central aspects of the reform:

I. exit flexibility: by narrowing the use of the reinstatement;
II. entry flexibility: by contrasting an excessive recourse to fixed-term contracts, but without reducing the contractual arrangements available to companies;
III. social absorbers: progressive reduction of the number of instruments available in case of unemployment and a parallel strengthening, also in terms of generational equity, of the existing ones without overturning the categorical nature of protection.

With respect to exit flexibility, the intervention of the new rules has focused on the regulation of individual dismissals and in particular on the sanctions regime of unfair dismissal[1], for which the possibility of reinstatement of the worker has been limited to the case of radical groundlessness (in addition to a reimbursement of 12 months salary and with the option for the worker to have a compensation), while is denied for disciplinary or economic dismissal that are thus covered only with compensations. The aim of the reform is therefore to stimulate compensations and to limit the reinstatement to extraordinary cases, like it is in Germany and in most European countries.

As regards entry flexibility*,* the reform made a long series of changes to the terms of contracts, with the aim to affirm the open-ended contract as the dominant one and the apprenticeship as the privileged channel to access the labour market, while restricting the abuse of the fixed-term contract (including employer-coordinated freelance work). The number of available contracts is essentially unchanged, as well as their functions. The efforts of the legislator moved to the establishment of more stringent constraints and new modes of apprenticeship, even in the implementation of the *Testo Unico* adopted in 2011[2], and to the limitation of fixed-term contracts, which become more expensive and rigid[3]. Note, finally, the rules that predispose margins of alignment between 'false' VAT numbers (*false Partita Iva*) and employer-coordinated freelance work, and between the latter and the employees, with all the derived consequences in terms of contribution (for details on the main novelties of contracts, see Tab. A1).

The third pillar of the reform introduced by Law 92/2012 is constituted by the system of social safety nets*,* which have been redesigned for the protection of both the unemployed and those under ongoing employment. The new rules are in force, even in this case, starting from 1 January 2013, and are subject to transitional arrangements that will bring reform in full swing from 2017 (Tab. A2).

As regards wage supplements, the adjustments introduced by the reform aim at evening out the use of this institution, through the establishment of bilateral funds of solidarity even in excluded areas, with the aim to extend protection without resorting to exemption measures.

More substantial are the changes introduced for the unemployment benefit and the mobility allowance (Tab. 3). With regard to the latter, the transitional phase has already started, with the resizing of the duration of treatment, which will progressively lead to its complete abrogation by 31 December 2016, when the new system will provide a single form of income support in case of unemployment: the social insurance for employment (*Assicurazione sociale per l'impiego* – ASPI).

The ASPI, which replaces and incorporates the current mobility allowance and unemployment benefit, affects all private sector employees (including apprentices, members of cooperatives and artistic staff) and those of the public sector with fixed-term contracts[4]. Like the previous unemployment benefit, it is modulated according to two regimes: the ASPI (with full requirements) and the Mini-ASPI (with less stringent requirements), which differ in the maximum duration of treatment, but not for the amount paid (as instead happened with the old unemployment benefits). Furthermore, the ASPI increases the maximum duration and the replacement rate compared to the traditional unemployment benefits (but not with respect to the mobility allowance). However, the most important intervention regards the Mini-ASPI, which removed the insurance requirement and changed the way and the amount of the allowance, which is now paid monthly and in the same proportion to that of the ordinary treatment ASPI. In this way, the Mini-ASPI (differently from the old unemployment benefit with low requirements) addresses to those who do not have the requirements for the ordinary unemployment benefit and includes many young and fixed-term workers. The duration of the Mini-ASPI corresponds to half of the working days in the year rather than to all the days worked (within the limit of six months). Finally, the contribution for employer-coordinated freelance workers (*contributo ai collaboratori in monocommittenza*), already experienced from 2009, became structural.

[1] For the discriminatory dismissals (discrimination of gender, age, political opinions, trade union membership, disability, etc.), however, the reinstatement is maintained.

[2] Legislative Decree No. 167 of 14 September 2011, *Testo Unico dell'apprendistato*.

[3] The only exception is the so-called fixed-term contract *acausale*, that is admitted for the first contract and for a maximum of 12 months. This type of contract, in fact, streamlines the procedures and generates thereby a strengthening flexibility.

[4] The agricultural unemployment benefits do not change.

Table 3
The main changes introduced by Law 92/2012 to the benefits in case of unemployment

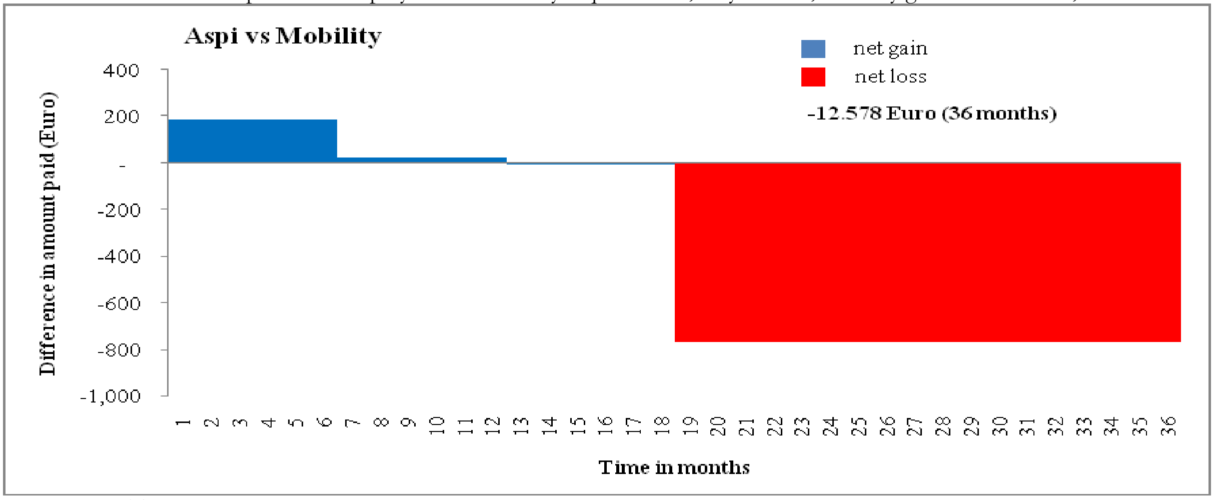
	Ordinary unemployment	Mobility	ASPI*
Workers concerned	Employees (no apprentices) of the private sector	Employees with open-ended contracts in companies admitted to CIGS	Employees including apprentices and fixed-term contracts in the public sector
Insurance requirement	1 week INPS enrolment prior to the previous two years	–	1 week INPS enrolment prior to the previous two years
Contribution requirement	12 months INPS contributions in the last 24 months	12 months seniority (6 of which actually worked)	12 months INPS contributions in the past 24 months
Duration of performance	8 months for under 50 12 months for over 50	12 months for under 40 years old (24 months in Southern regions) 24 months for 40-49 years old (36 months in Southern regions) 36 months for over 50 years old (48 months in Southern regions)	12 months for under 55 years old 18 months to over 55 years old
Entity of performance	60% for 6 months 50% for the 7th month 40% from 8th month	80% for 12 months 64% for the 7th month	75% for 6 months 60% from the 7th to the 12th month 45% by the 12th month

	Reduce unemployment a requirements	Mini-ASPI
Workers concerned	Employees (no apprentices) of the private sector	Employees including apprentices and fixed-term contracts in the public sector
Insurance requirement	1 week INPS enrolment prior to the previous two years	–
Contribution requirement	2 months in the calendar year contribution	3 months of contributions in the last 12 months
Duration of performance	Equal to the days actually worked in the previous year, up to a maximum of 6 months	Equal to half of the weeks of contributions in the last year
Entity of performance	35% for the first 4 months 40% for the 5th and 6th month	75% for 6 months

*Note. Transitional arrangements from 1/1/2013 to 31/12/2015, when the process will speed up.
Source: IRPET

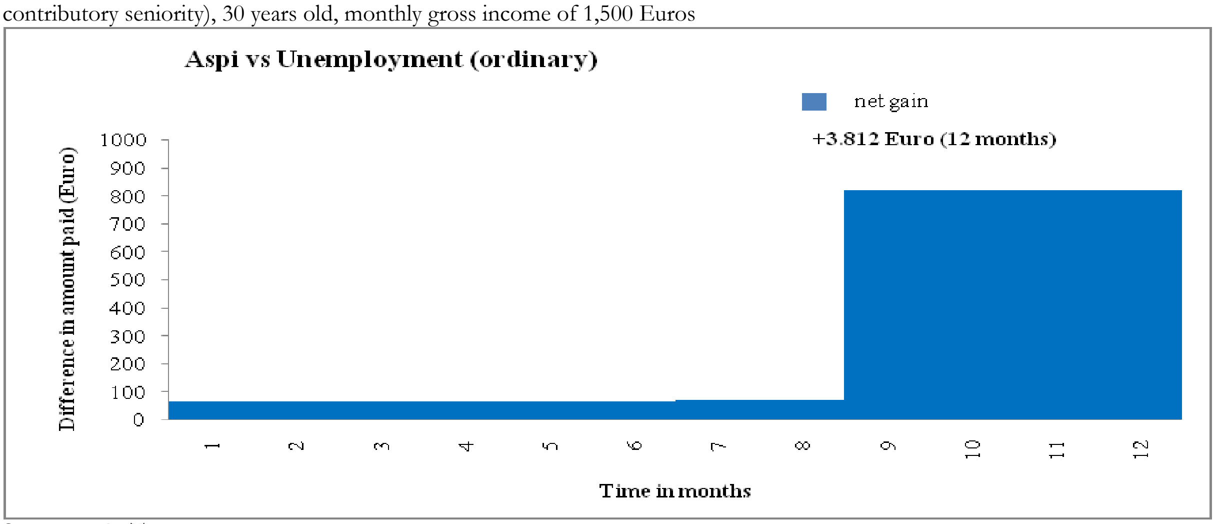
Operatively, the reform reduces social benefits for the unemployed with the requisites for mobility allowance (mainly adult workers) and it increases benefits for those eligible for unemployment indemnity. The ASPI and Mini-ASPI treatments are actually more generous than the previous unemployment benefits, in terms of both the amount paid and the duration (Figures 1-3 provide three explicative hypothesis). Therefore, the global financial impact of the reform depends on the distribution of such circumstances in unemployed population.

Figure 1
Difference in the benefits paid to unemployed with mobility requirements, 55 years old, monthly gross income of 2,000 Euros



Source: IRPET

Figure 2
Difference in the benefits paid to unemployed with a fixed-term contract, unemployment requirements (24 months of insurance and contributory seniority), 30 years old, monthly gross income of 1,500 Euros



Source: IRPET

Figure 3
Difference in the benefits paid to unemployed with a fixed-term contract, 18 months of contributory seniority (insurance seniority for reduced unemployment benefit not reached), 30 years old, monthly gross income of 1,500 Euros

Source: IRPET

2. A review of simulation methods

This paper takes part in the broad debate on flexicurity, particularly drawing from the body of literature that studies the distributive effects of social safety nets, with a focus on their role during the present crisis. In a recent study of Denmark, the home of flexicurity, it is put in evidence that, thanks to the generosity of social protection instruments, the impact of the crisis on unemployment and income has been mitigated and domestic demand has shown a higher stability with respect to other European countries; the labour market has also maintained good levels of dynamism, even if the pursuit of this strategy has resulted in a deterioration of public accounts (Jorgensen, 2011). To deal with the Italian case, the literature has focused on the construction of microsimulation models of the main events related to the crisis in the labour market (job loss, suspension, unemployment, mobility) in order to assess its effect on the income distribution inequality (see D'Amuri, 2011; D'Amuri et al., 2011; Baldini and Ciani, 2011).

The works for Italy are distinguished primarily for the database used for the simulation. In D'Amuri (2011) the database used for the simulation is the Labour Force Survey (LFS) of ISTAT, from which it is possible to know the transition between employment status, and the employment income. In particular, D'Amuri uses the longitudinal version of LFS to estimate the probability of moving from employment to non-employment (and vice versa) on a yearly interval (thereafter he passed from the year to the quarter through a numerical approximation). Then these probabilities are assigned to each individual and the change of status is attributed with the Monte Carlo method (when a random number extracted from a uniform distribution is lower than the probability). The simulation shows that two-thirds of the loss of employment for the period 2008:4-2009:4 would be due to the decrease of the probability of finding a job, while job losses related only to fixed-term contracts. The system of social shock absorbers would have been able to reduce the impact on unemployment of 30-40%.

In D'Amuri et al. (2011) the microsimulation model is made on the LFS for the period 2006-2010. The microsimulation is divided into three blocks: I) simulation of the transitions in the labour market by estimating the probability of moving from employment to non-employment and vice versa, II) estimates of access to social security benefits as a result of job loss when the requirements are present, III) assignment of labour income or pension to individuals. According to the authors, the individual monthly average net income calculated on the whole population would be reduced by 0.3% in 2008, 1.3% in 2009 and 0.2% in 2010. Individuals with less than 40 years suffer a higher reduction of income. The Gini index would decline between 2007 and 2010 of 1.6 percentage points.

In the exercise of Baldini and Ciani (2011) the LFS is used only as a support for estimating the probability of losing or finding a job (from the third quarter of 2006 to the same period of 2009), while the microsimulation model is made on EUSILC 2007 which provides detailed information on various sources of income. The probabilities of losing or finding a job are applied to individuals of EUSILC with the same socio-demographic-territorial characteristics, by attributing the change in status through the method of Monte Carlo. The simulation shows an increase in income inequality due to the crisis in the labour market. Social safety nets currently in force would reduce the increased inequality, without being able to cancel it.

2.1 The simulation methodology

In this paper, the microsimulation model is constructed on the LFS of ISTAT for many reasons:

- statistical representativeness at regional level higher than that of other surveys,
- availability of adequate information to simulate years of contributions of workers,
- possibility of adopting a time horizon that consists of successive quarters and then to calibrate the duration of the grant of unemployment benefits/mobility allowances consistent with the duration of the state of non-employment,
- details on the types of contract, which allow a more accurate estimate of the impact of the Fornero reform.

As regards the simulation of the transition probabilities between statuses (employed versus unemployed and vice versa), we decided to make them consistent with the quarterly change in the employment rate observed in the LFS. The choice of not using the LFS panel is explained by reasons of representativeness at territorial level. In addition to the transition between employment statuses we simulated the wage supplement, through the INPS administrative data, and the reduction of working hours due to the involuntary part-time.

The simulation is performed on quarterly data from 2008 to 2012. The variable used to measure income is net monthly labour earnings. This variable is however only available from 2009, and only for employees. The labour income of self-employed and the income of employees in 2008, then, are estimated through a Mincer regression

To estimate the self-employment income we used a regression on data from of the Bank of Italy's survey of household budgets (2008) regarding incomes from self-employment on a set of covariates also present in the LFS (see Tab. A3 for the regression output). Once estimated the coefficients of the regression we calculated the estimated income by applying them to the same covariates. The unexplained component was also attributed by extracting for each individual a random number from a normal distribution with mean zero and variance equal to that of the residuals from the regression. The same procedure was used to estimate the income of employees in 2008, by using the survey data as the basis of the 2009 workforce (Tab. A4).

The base period is the first quarter of 2008. For each individual sample of the base period, the following events are simulated from the first to the fourth quarter of 2012.

I) Changes in the labour market: hirings and layoffs

The first step is to calculate the employment rates from the LFS for the following classification variables (cells): geographical area (northeast, northwest, central and southern), age (up to 35 years and over 35 years), quarter, type of worker (dependent and independent), duration of the contract (open-ended and fixed-term), sector (industry and other). For each quarter, we compare the employment rate with that of the previous one: if the difference is negative, we compute the probability of losing a job; conversely, if the difference is positive, we calculate the probability of finding a job. Through the Monte Carlo method (similarly to the work of Baldini and Ciani, 2011), beginning from the first quarter of 2008, we select randomly for each cell individuals who lose and individuals who find a job, by comparing a random number drawn from a uniform distribution, and the probabilities previously estimated. Table A5 shows a comparison of the number of employed over time, between the simulation results (after Monte Carlo), the simulation objective (obtained by applying the employment rates for each quarter from the LFS to the population of the first quarter of 2008) and the LFS data. Furthermore, to test the equality between the simulated distributions of employed and those actually observed in LFS, we made a chi-square test, which showed that the joint distributions of age classes and geographical areas are not statistically different (table A6 in appendix). The hypothesis of equality of distributions is validated for all quarters. After having simulated the performance of the labour market, we simulated the access to shock absorbers (mobility or unemployment benefits[5]), the job loss without shock absorbers and the new jobs created in the following way.

Loss of employment with the mobility allowance. For each quarter the mobility allowance is attributed to individuals who have lost their jobs if they belong to the sector of industry, have worked in a company with more than 15 employees for at least one year and with at least six months of effective work[6]. The duration is set equal to 12 months for workers with less than 40 years, 24 months for workers between 40 and 49 years, 36 months for workers with more than 50 years. For individuals working in southern regions durations for mobility allowance are extended to 24, 36, 48 months depending on workers age. The allowance is equal to the 80% of the income for the first 12 months, and 65% of the income for the months ahead.

Loss of employment with the ordinary unemployment benefit. For each quarter the unemployment benefit is attributed to individuals who have lost their jobs with a seniority wage of at least two years and have a working experience of at least 12 months for the last two years. The subsidy is equal to 60% of net income for the first 6 months, 50% for the seventh month, and 40% by the eighth month (differentiating the duration by age).

Loss of employment with the unemployment benefits with low requirements. For each quarter the unemployment benefits with low requirements is attributed to individuals who have lost their jobs when they have a seniority wage of at least two years and a working experience of at least 2 months. The duration of the subsidy is equal to the number

[5] The composition between unemployment benefits (ordinary and reduced) and mobility is in line with INPS administrative data. However, the model underestimates the share of reduced unemployment benefits and it overestimates the ordinary unemployment benefits. This happens for several reasons. On one hand, the LFS sample is not completely able to represent the sporadic employment spells, that is a requirement for access to reduced unemployment benefits. The model itself has difficulties in simulating this discontinuity. In addition to this technical problem, as well described in Trivellato et al. (2012), administrative data show that a large share of beneficiaries of reduced unemployment benefits, have requirements to access the full subsidy.

[6] Mobility has been applied only to workers in companies that have access to CIG in relation to the proportion of the recipients of CIG on those that could access it.

of months of work for a maximum of one semester. For the first three months, the subsidy is 35% and for the following months it amounts to 40% of net income.

Loss of employment without subsidies for lack of requirements. For each quarter the income of individuals who have lost their jobs and are not eligible to obtain the mobility allowance or the unemployment benefit (ordinary and reduced) is put to zero.

New employment. For each quarter, individuals who find a job are assigned a net income that is equal to the 50th percentile of net income by geographical area (northeast, northwest, central and southern), age (up to 35 years and over 35 years), quarter, type of worker (dependent or independent), duration of the contract (fixed-term or open-ended), sector (industry or other).

II) Wage supplement (ordinary, extraordinary and in deroga*)*
The INPS data give the absolute number of beneficiaries (distinct individuals) of CIG in 2009 by gender and geographical distribution, the authorized hours per quarter (2008-2012), the geographical area and the effective hours per year. The absolute number of beneficiaries for each quarter has been obtained by applying the observed relationship between hours paid and beneficiaries in 2009 for each quarter from 2008 to 2012. Once obtained the beneficiaries for each quarter we calculated the probability of having CIG using the ratio of beneficiaries on eligible individuals calculated from the sample.

Through the Monte Carlo method we randomly selected individuals who have CIG and we attributed a duration per quarter equal to the ratio between the effective hours and the number of estimated beneficiaries. After transforming the hours in months, we assigned the income from CIG with a 80% reduction of net income for that period.

III) Change of job
For each quarter it is possible to simulate changes in working status both for the employees and the self-employed. In particular, we calculated the rate of part-time employment in subsequent quarters for different geographical areas and age groups. Then we compared the rate of part-time employment of each quarter with the previous one: if the difference was positive we calculated the probability of moving from full time to part time, and vice versa if the difference was negative. Even in this case, we attributed the transitions through the Montecarlo method. Once simulated the dynamics of working time it is then possible to attribute the reduction or increase in income deriving from it.

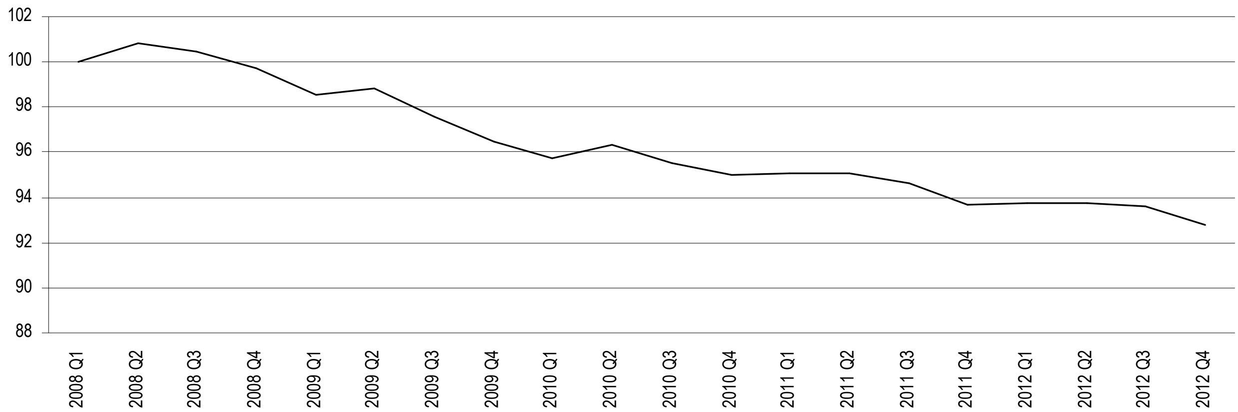
3. The impact of the crisis on income between generations

The economic crisis effects on the labour market have obviously influenced the average income of the population and its distribution among individuals and families. The microsimulation model allows analyzing how the events observed in the labour market have affected the revenues, highlighting the role of social safety nets.

Between 2008 and 2012 the trend of income, by following the employment trend, shows a gradual decrease from the fourth quarter of 2008 (Fig. 4). The trend changes (Fig. 5) show, however, a recovery in 2010 followed by a new recession in the second quarter of 2011 (double deep). The situation does not improve in 2012.

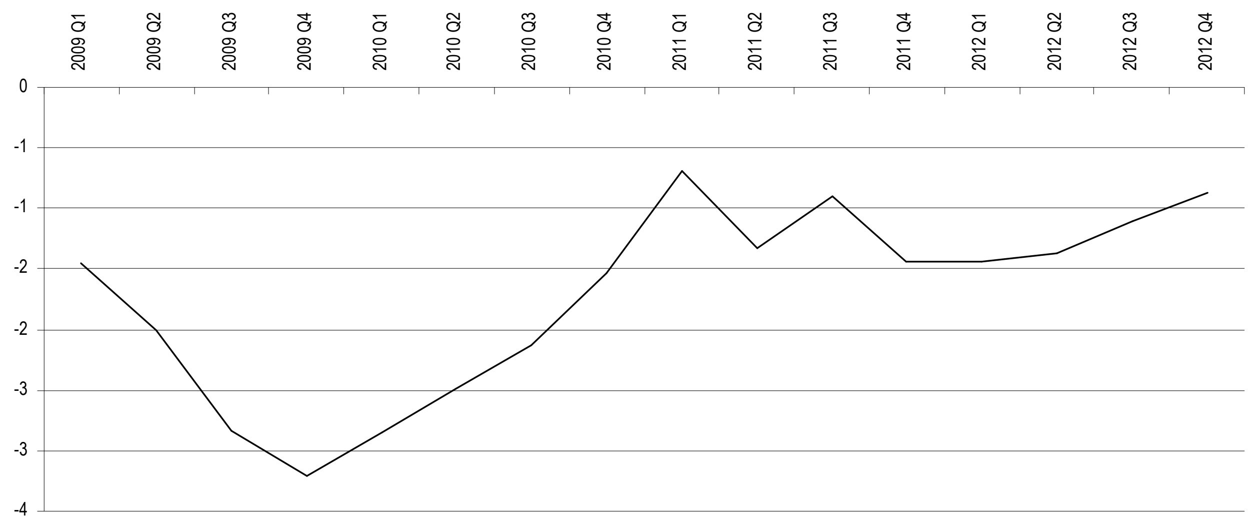
Overall, the average annual income fell by 2.7% between 2008 and 2009, 2.3% between 2009 and 2010, 1.1% between 2010 and 2011 and 1.2% in the last year, with a total loss of 7.1% in the entire period. Based on our simulation, between 2008 and 2012, the crisis has led to an impoverishment of the population quantifiable, on average, in around 704 Euros per year. The recession had asymmetric effects for workers (young and less young) and geographies, since it hit more heavily the industrial sector then services and focused on the weakest job positions. To measure these effects we compared the average pre-crisis income of 2008 and that of four years later (2012).

Figure 4
Average net income in Italy. 2008-2012 (amounting to 100 in the first quarter of 2008)



Source: IRPET on ISTAT, LFS

Figure 5
Variation trend of the quarterly average net income in Italy. 2008-2012



Source: IRPET on ISTAT, LFS

With regard to the comparison between the different areas of the territory, the most significant reduction in income occurred in the North East and the South of Italy (Tab. 4). In the North East the effect is due to the strong impact of the recession in the industrial sector. In the South the drastic fall in employment was caused by a lower number of exporting firms able to compensate for the weakness of domestic demand and a strong dependence on Public Administration procurements[7]. Social safety nets have had a dampening effect, reducing the loss of the average income of about two percentage points at national level. On the other hand the coverage by social protection schemes is not uniform; it can be noticed that the share of income recovered thanks to the role of social safety nets is higher in the northern regions (about 17%) and lower in the South (13%). Therefore, the crisis seems to have accentuated the differences in income between geographical areas. And shock absorbers have not been able to neutralize the accentuation of dualism.

[7] In many cases, these have being blocked or have been subjects to long delays in payments for goods and services purchased.

Table 4
Percentage change in average net income by geographical area between 2008 and 2012. Italy

Geographical area	% var. with shock absorbers	% var. without shock absorbers	% share of income recovered with shock absorbers
North West	-6.3	-7.6	16.6
North East	-7.2	-8.6	16.7
Centre	-7.0	-8.4	16.2
South	-8.1	-9.4	13.2
ITALY	-7.1	-8.4	15.6

Source: IRPET on ISTAT, LFS

In addition the recession has affected more strongly the younger generation. To a strong reduction in the employment of the younger corresponds a fall in their average income of 18.1% in the time between before and after the crisis. The reduction was much less significant for the over-35, with a loss of around 3.3%. Social safety nets, which protect more broadly workers with upper-middle-age and experience with previous works (in particular through unemployment benefits), had a significantly more important role for over-35 compared to young workers in mitigating the loss of income due to the crisis in the labour market (Tab. 5).

Table 5
Percentage change in average net income by age classes between 2008 and 2012. Italy

Class of age	% var. with shock absorbers	% var. without shock absorbers	% share of income recovered with shock absorbers
Up to 35 years	-18.1	-19.6	6.7
Over 35 years	-3.3	-4.7	28.2
Total	-7.1	-8.4	15.6

Source: IRPET on ISTAT, LFS

Social safety nets seem to protect less the workers who most need protection because most affected by the crisis; in this way they help to consolidate the ‘dual’ system that characterizes the Italian labour market. The following table shows even more clearly this imbalance. In the South, workers over 35 years old with a strong reduction in income (-6.6%), have the lowest protection (22.0%). Furthermore, the South is the area where the protection for young workers is the lowest, 5.2% against about 7% in the rest of Italy.

Table 6
Percentage change in average net income by age group and division between 2008 and 2012. Italy

Class of age	Geographical area	% var. with shock absorbers	% var. without shock absorbers	% share of income recovered with shock absorbers
Up to 35 years	North West	-17.7	-19.2	7.3
	North East	-19.1	-20.7	6.7
	Centre	-17.7	-19.3	7.5
	South	-18.1	-19.1	5.2
Over 35 years	North West	-2.4	-3.7	33.1
	North East	-2.9	-4.4	33.4
	Centre	-3.6	-5.0	27.0
	South	-4.7	-6.0	22.0
Total	ITALY	-7.1	-8.4	15.6

Source: IRPET on ISTAT, LFS

3.1 The impact of the crisis with the enforced reform

The reform of the labour market looks like a very complex set of rules for the labour market, aimed at reaching a flexibility that can be combined with a better generational distribution, without demolishing the existing categorical job security model. The flexibility measures aim to encourage the dynamism of the Italian labour market and their effect can be evaluated through the practical experience followed by judges on one side (exit flexibility) and companies (recruitment) on the other side; these behaviours, however, will be closely influenced by the evolution of the economy.

The functioning of the reformed social safety nets can instead be evaluated through a simulation on past data, reproducing the degree of income protection that would have been recorded if the system of social safety nets were already reformed. With regard to protection against unemployment the reform has operated essentially in two directions:

1) reducing the degree of protection for workers with high seniority through the elimination of the mobility allowance (on stream in 2017) as compared to the marginal extension of guarantees provided with ASPI;

2) extending the protection of workers with short or discontinuous work experience, replacing the unemployment benefits with low requirements with the so-called Mini-ASPI (employer-coordinated freelance work remained instead largely under-protected).

The reform of unemployment benefits is, therefore, central to inquire about the balance of protection expected from the new rules. The following table shows the effect of these changes on the degree of coverage of social safety nets resulting from the simulation. The coverage of social safety nets appears to increase after the reform, mainly due to the effect of the introduction of the Mini-ASPI and also thanks to the increase of ASPI's replacement rate. However, the increase in protection is not distributed equally among the categories of workers. Regarding the geographical area the reform increases the degree of protection especially in the South, where the incidence of fixed-term contracts and sporadic employment is higher, thanks to the abolition of the insurance requirement (table 7).

Table 7
Share of income recovered thanks to social safety nets before and after the reform by geographical area

Geographical area	% share of income recovered with shock absorbers	% share of income recovered with shock absorbers reformed
North West	16.6	21.8
North East	16.7	17.9
Centre	16.2	20.8
South	13.2	18.6
Total	15.6	19.8

Source: IRPET on ISTAT, LFS

In the comparison between generations, it seems to be a more pronounced increase of protection for young people (+5.6%) than that observed for the over-35 (+2.1%), which weighs more on the elimination of the mobility allowance. Young people are, as a matter of fact, advantaged from the extension of ASPI to apprentices and from the abolition of the insurance requirement for Mini-Aspi. Workers over 35 years are positively affected by the higher replacement rate and duration of Aspi, but they lose with the abolition of the mobility allowance.

Table 8
Share of income recovered thanks to social safety nets before and after the reform by class of age

Class of age	% share of income recovered with shock absorbers	% share of income recovered with shock absorbers reformed
Up to 35 years	6.7	12.3
Over 35 years	28.2	30.3
Total	15.6	19.8

Source: IRPET on ISTAT, LFS

As can be seen in table 9, in the North East, where the usage of mobility is high, workers over 35 years are very disadvantaged from the reform, with a share of income recovered after the reform lower than before. Young workers of the Centre are, instead, particularly advantaged from the extension to apprenticeship of Aspi (as a matter of fact in this area the incidence of this contract is high with respect to the others). Among workers up to 35 years those living in the South of Italy, where fixed-term contracts are very common, are particularly advantaged.

Table 9
Share of income recovered thanks to social safety nets before and after the reform by class of age and geographical area

Class of age	Geographical area	% share of income recovered with shock absorbers	% share of income recovered with shock absorbers reformed
Up to 35 years	North West	7.3	13.5
	North East	6.7	9.9
	Centre	7.5	14.2
	South	5.2	11.7
Over 35 years	North West	33.1	36.1
	North East	33.4	31.3
	Centre	27.0	29.1
	South	22.0	26.3
Total	ITALY	15.6	19.8

Source: IRPET on ISTAT, LFS

In conclusion, our exercise shows that the current social system has contributed significantly to contain the costs of the recession, but had a different impact among workers and territories. In both cases, this reflects the fact that shock absorbers are directed mainly to the industrial sector[8] (more present in the Centre-North) and to specific categories of workers (with less discontinuity in contributions). The Fornero reform reduces these differential effects by ensuring a greater coverage to the under 35, counterbalanced by a marginal improvement for the over 35. This is the 'exchange' that seems to be taking place and is reflected in the ongoing debate between the social partners.

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[8] An example is the institution of mobility or of the CIG, which are for the exclusive (the first) or main (the second) benefit of industrial workers.

Appendix

Table A1
Major innovations introduced by Law 92/2012 for the types of contracts

Types of contracts	**Major changes of L. 92/2012**
Fixed-term contract	1.4% increase in the rate of social contributions (for ASPI, the additional rate will be returned to the employer in case of transformation in an open-ended position); extension of time before repetition of contract (from 10-20 days to 60-90 days).
Placement contract	Repealed.
Work *in somministrazione*	Maximum duration of the contract between the agency and the worker is 36 months.
Apprenticeship	Privileged channel access (it is considered an open-ended contract and it does not pay the increase in social contributions) with 6 months minimum duration; new apprenticeship contracts are restricted to firms which reach the target of 50% of apprenticeship stabilizations during previous three years period (30% for the first three years of application); relationship apprentices-skilled workers is fixed in 3/2 (1/1 for firms up to 10 employees); the use of work *in somministrazione* is completely banned for this contract.
Part-time	Permitted the modification/deletion of 'elastic' clauses by the worker.
Intermittent contract	Obligation of prior notification on the occasion of each work-call; usage limited to sectors who permitted this contracts in their collective bargains (limitation not applied for people over 55 and up to 25 years old).
Employer-coordinated freelance work	More stringent definition of project, limiting the possibility of withdrawal of the employer (only for just cause or professional unfitness); presumption of subordination when the job corresponds to the activity of employees (exception for high professionalism), transformation in dependent employment in case of non identification of the project; progressive alignment (one point per year, from 2013 to 2018) of contributions to the INPS dependent management.
VAT numbers	For relations established after the law's entry into force (with the exception of performances connected to professional registers, higher education positions and activities reported annual income exceeding 1.25 times the minimum contributory income of traders) the presumption of coordination applies in the following cases: i) duration exceeding six months in the calendar year, ii) revenue above 75% of the total in the calendar year, iii) availability of a workplace; in such a cases professional relations are assimilated to employer-coordinated freelance work in terms of contributions and these are eventually transformable in dependent employment (in the cases cited above).
Joint venture	The number of members who carry out the same activity can not be more than three (excluding family members) and the associated needs to participate in the profits, otherwise it is assumed a dependent open-ended employment relationship.
Accessory work	The total amount of fees during the year can not be more than a total of 5 thousand Euros in the calendar year and it is expected the adjustment of social security contributions at the rates of the INPS independent management.

Source: IRPET

Table A2
Major innovations introduced by Law 92/2012 to the system of social safety nets.

Social safety nets	Major changes of L.92/2012
Protection under ongoing employment	
	Extension of CIGS treatment (commercial operators with more than 50 employees, travel and tourism agencies with more than 50 employees, private security firms with more than 15 employees, businesses and airports regardless of the employees), establishment of bilateral INPS funds for companies excluded from CIG and CIGS (mandatory only for companies with more than 15 employees); the fund is paid for 2/3 by the employer and 1/3 by the workers, and it operates under a balanced budget.
Mobility allowance	
	Shall establish the maximum durations of the allowance for the transitional period (2013, 2014, 2015, 2016), from a minimum of 12 months for the younger to a maximum of 36 months for the older (48 in the South); from 1/1/2017 the mobility allowance will be removed.
Unemployment benefits	
ASPI	From 1/1/2013 the benefit will be addressed to involuntarily unemployed (including apprentices and members of cooperatives) with at least two years of insurance as dependent and at least 12 months of contributions within two years prior to unemployment; the amount is equal to 75% of the salary (if the income does not exceed € 1,180, otherwise this component is added to the 25% of the difference between the monthly salary and this threshold) for the first six months and it decreases by 15% in the second half and a further 15% after one year of benefits; from 1/1/2016 the maximum duration of ASPI will be 12 months for workers younger than 55 years and 18 months for those over the age of 55 (within the limits of weeks of contributions during the two-year period) with the payment of imputed contributions for retirement funds and the possibility to 'suspend' the treatment in case of new employment spells up to 6 months.
Mini-ASPI	From 1/1/2013 the benefit will be addressed to involuntarily unemployed who, despite not having gained the requirements for the ASPI, come from at least 13 weeks of contributions as dependent; the amount paid follows the same calculation of ASPI and the duration corresponds to half of the weeks of contributions of the last year; also for this case suspension is provided up to a maximum of 5 days.
Financing ASPI	The new system of unemployment insurance provides for an increased rate of 1.4% for fixed-term employees (not hired for replacement or seasonal positions). In the event that the forward contract is converted into open-ended, the contribution is returned to the employer. The employer must, however, pay a contribution to INPS for dismissal of the amount of 0.5 month's salary for every 12 months' seniority in the last three years (including periods of work completed) for workers with open-ended contracts and apprentices (except resignation); in the case of collective dismissal and in the absence of specific agreements with the unions the contribution triples.
Severance grants to employer-coordinated freelance work	
	For employees who have worked in *monocommittenza* in the previous year, with at least 4 months paid to INPS independent management, an income tax of less than 20 thousand Euro and an uninterrupted period of unemployment of at least 2 months, the amount of the allowance is equal to 5% of the minimal annual income (handicraft industry and trade) multiplied by the lowest number of monthly payments credited to the previous year and those not covered by contributions.
Contributions for workers who belong to INPS independent management	Progressive increase in contributions up to 33% by 2018 (with equalizing contribution rates of employees).

Source: IRPET

Table A3
Output Regression self-employment income in 2008

Changeable	DF	Estimate of parameters	Standard error	Value t	Pr > | T |	Inflation variance
Intercepts	1	7.87108	0.18626	42.26	<.0001	0
Class of age	1	0.19199	0.05714	3:36	0.0008	31.4354
Class of age	1	-0.0124	0.00445	-2.78	0.0055	31.4201
Class of age	1	-0.5136	0.17658	-2.91	0.0037	10.8271
Interaction graduation – age class	1	0.08777	0.02595	3:38	0.0007	10.7926
Entrepreneur	1	0.1357	0.08225	1.65	0.0992	1.03707
Practitioner	1	0.23626	0.06022	3.92	<.0001	1.41403
North West	1	0.29341	0.05803	6.5	<.0001	1.36834
North East	1	0.17248	0.05655	5.3	0.0023	1.37864
Center	1	0.1316	0.06092	16.02	0.0309	1.34231
Man	1	0.11011	0.04868	02.26	0.0239	1.08074
Hours	1	0.00043	3E-05	14.5	<.0001	1.10753
R-Squared corr	0.2069					
Number of observations	1,336					

Source: IRPET on Bank of Italy, Survey on Italian household budgets

Table A4
Output Regression employment income in 2009

Changeable	DF	Estimate of parameters	Error standard	Value t	Pr > | T |	Inflation variance
Intercepts	1,000	5,997	0.007	915990	<.0001	0.000
Class of age	1,000	0.126	0.002	73,990	<.0001	25,602
Class of age	1,000	-0.008	0.000	-55370	<.0001	26,048
Class of age	1,000	-0.050	0.006	-8030	<.0001	10,246
Interaction graduation – age class	1,000	0.028	0.001	27,880	<.0001	10,853
North West	1,000	0.113	0.002	60,190	<.0001	1,416
North East	1,000	0.128	0.002	64920	<.0001	1,379
Center	1,000	0.071	0.002	32,710	<.0001	1,298
Man	1,000	0.142	0.002	87,220	<.0001	1,299
Hours	1,000	0.000	0.000	77.040	<.0001	2,081
Part-time	1,000	-0378	0.003	-135470	<.0001	1,972
Manager	1,000	0.652	0.005	131,280	<.0001	1,256
Framework	1,000	0.441	0.003	133970	<.0001	1,367
Employee	1,000	0.250	0.002	150,600	<.0001	1,326
Industry	1,000	0.042	0.002	24,360	<.0001	1,243
R-Squared corr	0.549					
Number of observations	170,972.000					

Source: IRPET on ISTAT, LFS

Table A5
Employed for quarters (thousand): simulation VS LFS

Simulation result	Simulation objective	LFS
23,130	23,113	23,168
23,024	23,020	23,119
22,819	22,819	22,974
22,432	22,389	22,578
22,589	22,587	22,819
22,401	22,388	22,661
22,240	22,233	22,543
22,058	22,035	22,367
22,203	22,253	22,614
22,063	22,038	22,438
22,090	22,135	22,567
22,054	22,029	22,493
22,157	22,208	22,714
22,047	22,059	22,571
22,026	22,040	22,553
21,947	21,886	22,396
22,034	22,112	22,628
21,989	22,006	22,525
21,913	21,856	22,375

Source: IRPET on ISTAT, LFS

Table A6
Chi-Squared Test for equality of joint distribution of age classes and geographical area of employed- Simulation result VS LFS

	Simulation result								LFS								
Quarter	North East - Under 35	North East - Over 35	North East- Under 35	North West- Over 35	Centre - Under 35	Centre - Over 35	South - Under 35	South - Over 35	North East – Under 35	North East - Over 35	North West- Under 35	North West- Over 35	Centre - Under 35	Centre - Over 35	South - Under 35	South - Over 35	P- Value
2008 Q2	9.3	20.3	6.8	14.8	6.2	14.4	9.0	19.3	9.3	20.3	6.8	14.8	6.2	14.4	8.9	19.3	1.00000
2008 Q3	9.2	20.4	6.9	14.9	6.1	14.4	8.8	19.2	9.2	20.4	6.8	15.0	6.1	14.5	8.7	19.2	1.00000
2008 Q4	9.2	20.4	6.8	15.1	6.1	14.6	8.5	19.2	9.1	20.5	6.7	15.2	6.1	14.7	8.3	19.3	1.00000
2009 Q1	9.1	20.6	6.8	15.1	6.0	14.9	8.4	19.1	9.0	20.8	6.7	15.3	5.9	15.0	8.1	19.3	1.00000
2009 Q2	8.9	20.8	6.6	15.2	6.1	14.8	8.3	19.3	8.7	20.9	6.5	15.4	6.0	15.0	8.0	19.4	1.00000
2009 Q3	8.9	20.9	6.6	15.1	6.2	14.7	8.3	19.4	8.7	21.0	6.4	15.3	6.0	14.9	8.1	19.6	1.00000
2009 Q4	8.9	21.0	6.5	15.1	6.0	14.8	8.2	19.4	8.6	21.2	6.4	15.4	5.9	15.2	7.8	19.5	1.00000
2010 Q1	8.8	21.0	6.5	15.4	6.0	15.0	7.9	19.3	8.6	21.3	6.3	15.8	5.8	15.3	7.6	19.5	1.00000
2010 Q2	8.7	21.0	6.4	15.4	5.9	15.1	8.0	19.5	8.4	21.2	6.2	15.7	5.7	15.4	7.6	19.7	1.00000
2010 Q3	8.7	21.1	6.4	15.4	6.0	15.0	8.0	19.5	8.2	21.5	6.2	15.9	5.8	15.3	7.5	19.7	1.00000
2010 Q4	8.7	21.2	6.4	15.3	5.9	15.0	8.0	19.5	8.3	21.6	6.1	15.7	5.6	15.4	7.5	19.8	1.00000
2011 Q1	8.7	21.3	6.4	15.5	5.8	15.0	7.9	19.4	8.2	21.7	6.1	16.0	5.5	15.5	7.3	19.6	1.00000
2011 Q2	8.5	21.2	6.3	15.5	5.8	15.1	8.1	19.5	8.0	21.6	5.9	16.0	5.5	15.6	7.4	19.9	1.00000
2011 Q3	8.5	21.2	6.3	15.7	5.8	15.0	8.0	19.5	7.9	21.7	6.0	16.3	5.4	15.5	7.4	19.8	1.00000
2011 Q4	8.6	21.2	6.2	15.7	5.6	15.0	8.0	19.6	8.2	21.8	5.8	16.3	5.3	15.5	7.2	19.9	1.00000
2012 Q1	8.4	21.5	6.2	15.7	5.6	15.1	8.0	19.5	7.8	22.1	5.8	16.4	5.2	15.7	7.2	19.7	0.99999
2012 Q2	8.3	21.5	6.1	15.7	5.7	15.2	7.9	19.6	7.7	22.0	5.7	16.3	5.4	15.8	7.2	20.0	0.99999
2012 Q3	8.3	21.5	6.1	15.9	5.6	15.2	7.8	19.7	7.7	22.0	5.7	16.5	5.3	15.7	7.1	20.1	0.99999
2012 Q4	8.3	21.5	6.0	16.0	5.5	15.3	7.8	19.7	7.6	22.1	5.5	16.7	5.0	15.9	7.0	20.1	0.99998

Source: IRPET on ISTAT, LFS