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Italian NEETs in 2005–2016: have the Recent Labour Market Reforms Produced Any Effect?

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Abstract

Using an Autoregressive Distributed Lag (ARDL) model with a seasonal frequency, this study attempts to analyse the changes occurred in the share of Italian NEETs (young people Not in Employment, Education and Training), from 2005 to 2016. The recent economic crisis increased the share of NEETs in many European countries. This work aims at analysing the main determinants of the NEET phenomenon in Italy, starting from the wider European framework. Furthermore, the Chow test for the structural breaks detection allows verifying if a structural break occurred in the share of Italian NEETs over time, as a consequence of the introduction of this Youth Guarantee Fund and of the overcoming of the deepest phase of the crisis. The under-representation of women in the labour market, and the North-South dualism, required different analyses. The results confirm that a significant structural break happened in the levels of NEETs almost everywhere, in 2014. It was directly ascribable to the trend observed in the share of NEETs in the South of Italy, especially for women, in contrast with the Centre and North-east, where it refers in particular to men. (JEL codes: J13)

Key words: NEETs, youth unemployment rate, early school leavers

1. Introduction

One of the most significant consequences of the global financial and economic crisis of the last decade was the dramatic increase, almost everywhere, of unemployment rates, especially for younger generations. Young people represent one of the most vulnerable segments of population because of their limited work experience, their weaker work contracts and a labour market that primarily tends to protect older workers. Within the European Union (EU), these facts drove countries very far from the objectives fixed in the Lisbon strategy, which embraced full employment and the creation of the most competitive and dynamic

knowledge-based economy in the world (European Parliament 2000). However, the economic crisis did not hit all European countries to the same extent and Southern European countries were hit more severely by the economic crisis. Nevertheless, in order to describe the difficulties met by young people on the labour market, many authors (see e.g. Martin et al. 2007) suggested to refer to Not in Employment, Education or Training (NEET) indicator. It includes young people in the 15–29 age class not in employment, in education, or in training. Therefore, the NEET indicator considers, besides unemployment, those who are inactive but not students. Looking at the trend of the share of NEETs in the 2005–2016 period, levels remained almost stationary at the EU-28 level, going from 15 to 14.2%. Nevertheless, Italy noted the highest increase, 4.3%. Germany, the Czech Republic, Bulgaria, Poland, and Slovakia showed similar variations but of opposite sign. Anyway, in Italy, high percentages of NEETs are explainable for other reasons in addition to high unemployment rates. Indeed, among the Mediterranean countries, Italy shows the highest percentage of inactive youth, 58% of total NEETs. This may be due to the low propensity to work of specific groups of people, but also to the fact that, during economic downturns, high levels of youth unemployment dramatically increase the share of discouraged young people who give up job searching altogether. In addition, other causes hide behind the high share of NEETs. This is an alarming issue because a prolonged period of unemployment and inactivity predisposes young people to give up looking for a job. Remaining unproductive and losing the opportunity to improve human capital results in an erosion of skills in workers and a reduction in their employability (Bruno et al. 2014). It also produces the accumulation of several disadvantages that usually predict future long-term unemployment and can lead to poor mental health (Strandh et al. 2014) and other failures in the private life (OECD 2014). In addition to the social impact of this phenomenon, the economic consequences are still more severe, especially in an era of ageing population, because youth hold the key to a sustainable and prosperous future as their skills and creativity can increase countries' economic growth and development. The OECD estimated that for Italy the cost of NEETs can be quantifiable in 1.3 Gross Domestic Product (GDP) points (OECD 2016). NEETs also have a strong impact on public finances in terms of welfare schemes (such as unemployment benefits, child benefits, housing benefits, and education-related allowances), of missed gains due to the lack of productivity, as well as additional health, welfare and criminal justice expenditure.

Therefore, the scientific and institutional communities have been currently paying attention to NEETs. In the last years, in order to favour the access of young people in the labour market and contrast the high unemployment rates observed in many European countries, many initiatives have been taken at both Communitarian and national levels. In particular, in 2014, the European Commission, solicited by the European Parliament, implemented and financed the Youth Guarantee Fund. It consists of a number of plans to target youth unemployment, including apprenticeship and traineeship programmes and support schemes for young entrepreneurs finalized at creating opportunities to exit from the NEET status, ensuring that all young people receive a great-quality offer of job or continued education. In the same period, at national level many labour market reforms went in the same direction.

The aim of this article is to analyze the changes that occurred in the share of Italian NEETs in the years from 2005 to 2016. With this intend, it is important to start from a broader perspective, studying the Italian peculiarities within the European context. This could help to explain why Italy shows the highest share of NEETs. Then, the authors try to

understand if the last years partial recovery of Italian economy after the crisis and the recent initiatives taken at both Communitarian and national level produced some effects in the reduction of NEETs levels. Therefore, the paper considers a macroeconomic approach for the study of the NEET phenomenon over time and implements the Chow test for detecting possible structural breaks. Furthermore, in light of the extreme complexity of the phenomenon and of the long lasting structural Italian issues represented by the under-representation of women in the labour market and by the North-South dualism (with the South lagging behind in terms of employment rates and industrial production), separate analyses for different segments of Italian NEETs have been required. Therefore, the analysis has been developed by gender and by considering separately the NUTS 1 Italian macro-regions. Moreover, considering the difficulties of transition from the educational system (school or university) to work, which in Italy is a very long process that frequently forces many young people to remain in the parental home for longer, in this article, the authors refer to a wider age class in their identification of NEETs, from 15 to 34.

The paper is organized as follows: in Section 2, a brief overview of the economic and legislative framework is presented; Section 3 addresses the relationships between the levels of NEETs and some important economic indicators across countries and over time, while in Section 4, the methodology is presented. Sections 5 reports the main findings. Finally, Section 6 concludes.

2. The economic and legislative framework

NEETs are a relatively recent construct, even if the attention on young people not in employment, education or training started in the early 1980s in the UK, where this segment of population was first identified and analyzed (Furlong 2006). In those years, the most developed economies suffered a generalized decrease in GDP growth, reasonably attributable to the deceleration in productivity (Pryor 1996). In the decade that followed, the 90s, the increase in labour productivity was mainly driven by the progress in technologies, sparking a process of total transformations of skills and jobs. This process is still in force and produced the destruction of mid-level jobs and a substantial rise in income inequality (Usanov and Chivot 2013). Although controversial, the most validated economic theories show as a further outcome the presence of high structural unemployment in recent years, driven by the rapid technological change (Ford 2009; Scarpetta et al. 2012). In this economic context, the recent global economic and financial crisis, which started in the middle of 2000s, hit more severely the weaker economies, where the mentioned processes already kept high the levels of unemployment (Eurofound 2013) and produced the strongest effects on the most vulnerable segments of population, such as young people. Youth unemployment is more sensitive to the business cycle than adult unemployment. This is due, on the one hand, to the barriers imposed to layoffs, which to different degrees characterize all developed economies and depend on the impact that unions have on the labour market and, consequently, on the levels of labour protection through legislation. On the other hand, it depends on the fact that being new entrants with limited work experience, they have major difficulties in finding a job and are exposed to higher risks of unemployment through temporary and part time contracts, which make them more vulnerable to easy layoffs during weak economic cycles (Dolado et al. 2002; Boeri 2010). Furthermore, globalization and the increased market complexity prolonged the process of transition of young people from school to work (Feighery 2013). While continental countries showed a dual process of education system

more tailored on the labour market and Scandinavian countries compulsory active policies for unemployed, in countries like Italy, the segmentation of the labour market, the unsatisfactory outcomes of education, not adequately oriented to the labour market, and the low capacity of public employment services to provide tailored services are only some of the factors contributing to the creation of a greater disadvantage for young people (European Commission 2016; Hadjivassiliou et al. 2016). From the early nineties onward, based on the concept that a relatively more liberalized labour market would spur job and competitiveness, many European countries implemented structural reforms to lift firing restrictions, reduce minimum wages, cut back on social benefits, and encourage firm level bargaining (Kleinknecht et al. 2014). However, one of the main consequences of the flexibility introduced by these reforms was the deregulation in the use of temporary contracts. Thus, rather than significantly increasing employment rates, these reforms produced dual labour markets, where those with temporary contracts, when not laid off, tended to be trapped into temporary jobs with only a precarious link to the labour market (Boeri and Garibaldi 2007; Bentolila et al. 2008).

At the European level, many countries, such as Germany, have significantly improved the condition of young people in the labour market through ad hoc apprenticeship policies. German policies started from the consideration that the education system plays a key role, offering young people a broad range of career pathways—from apprenticeships to university education.

In Italy, in the last two decades, the labour market has undergone profound transformations not only from a structural and social perspective but also from a legislative one. In 1997, Law n. 196 (the so called 'Pacchetto Treu') introduced innovations to different types of labour contracts with the aim of transposing to the Italian labour market the principles of flexibility and security (defined flexicurity) according to the European Employment Strategy. The new contractual frameworks included apprenticeship schemes, part-time employment, and temporary contracts. Furthermore, the creation of temporary work agencies aimed to facilitate the matching between supply and demand in the labour market. The first empirical analyses on the effects of the huge reduction of employment protection legislation and of the introduction of these liberalization measures provide heterogeneous evidence on the link between labour market liberalization, productivity dynamics, and employment growth (see, among the others, Pini 2014; Cirillo and Guarascio 2015). In any event, the results seem to converge on a negative correlation between liberalization and labour productivity because temporary workers appear to be less motivated and thereby less productive (Boeri and Garibaldi 2007; Battisti and Vallanti 2013). On the other hand, the increase in the labour flexibility seems to have increased the Italian employment rate (Lucidi and Kleinknecht 2010), even if, looking specifically at women and young people, this relationship is weaker. However, the Italian system of unemployment benefits, which is widely segmented, did not demonstrate an ability to protect and cover all the unemployed. The subsequent reforms of 2003 (Legge Biagi), which provided a common framework to atypical contracts, and 2012 (law n. 92 by Minister Fornero) introduced radical innovations in labour contractual forms, reducing the level of employment protection, making layoffs easier, but without improving an obsolete and inadequate employment security system, which required appropriate measures of unemployment benefits. The situation further worsened with the economic crisis of the late 2000s (Fadda and Tridico 2015). The last 2014 reform, known as Jobs Act (law n. 183, approved in December 2014 and completed with the Legislative Decrees of March, defined a revision of the unemployment benefit system

without increasing protection. It introduced a new contract type, resulting in a substantial downsize of obligation for workers' reinstatement in case of firms invalidly firing them (Fana et al. 2015). Furthermore, it increased incentives for the creation of open-ended jobs under the new contract with gradual protections, and by extending the coverage of out-of work benefits. In the same year, to reduce the high shares of NEETs and of youth unemployment rates, the European Commission, solicited by the European Parliament, implemented and financed the Youth Guarantee Fund following the example of Sweden that successfully experimented it in the previous years. It consists in a number of plans to target youth unemployment and was addressed to all European regions with a youth unemployment rate higher than 25%. In Italy, in a first time, the North-East regions of Veneto and Trentino-Alto Adige were excluded because they did not satisfy this requisite; anyway, it was chosen to extend the scope to the Belluno, Rovigo and Venice provinces, because their youth unemployment rates were higher than 25% (www.garanziagiovani.gov.it). In addition to including apprenticeship and traineeship programmes and support schemes for young entrepreneurs, it was designed to provide an information and guidance system, including orientation services and continued education, guaranteeing to all actors involved immediate access to employment centres, authorized private and public agencies, regions and ministries (Directorate-General for Internal Policies 2014). Indeed, the Programme requires Member States to offer European young people with employment, continued education, an apprenticeship or a traineeship within 4 months, after having left school and before becoming unemployed. In Italy, since its introduction in May 2014, many NEETs have subscribed. Although the Commission suggested to involve young people until 25 years, in Italy, in light of the longer duration of the transition process from school to work, it has been extended to young people aged under 30. In any event, some early studies (Voltolina 2016; European Commission 2017) seem to demonstrate that this system drove subscribers towards a permanent job contract in only a few cases. The opportunities offered consisted mainly in stages and apprenticeship programmes that in less than 50% of cases translated into new jobs (ANPAL 2017; European Commission 2017), and the recent increase in the youth employment rates has mainly concerned temporary contracts, most of which are only 3 months long (Ministero del lavoro et al. 2017). In any event, this new system contributed to an increase in the activity rate among young people, helping them to improve their skills. It is therefore interesting to verify if in the last years the NEET rates decreased and identify the factors affecting this trend.

3. Cross-country differences and changes over time in the share of NEETs during the crisis

3.1 A preliminary analysis

Analyzing NEET determinants and patterns is a very complex task and requires the analysis of the wider economic scenario, concerning the unemployment rates of the total population, specifically of youth, the propensity to participate to the labour market, the level of education of individuals, etc. The levels of economic growth, economic development, and labour productivity also play a significant role in driving the economy of each State member in the global market. With reference to Eurostat data (Eurostat on line database: ec.europa.eu/eurostat/data/database), comparing European countries

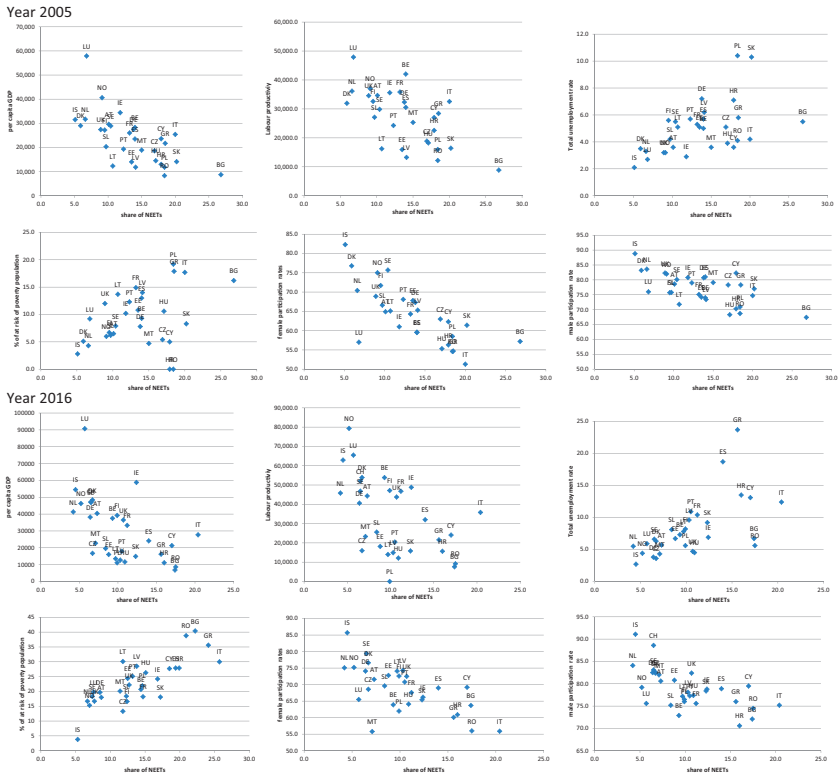

Figure 1. European countries projections according to the share of NEETs and other relevant macroeconomic indicators, years 2005 and 2016.

(*) For labour productivity and at risk of poverty population the reference years are 2006 and 2016.

Source: Eurostat on line database.

according to their levels of NEETs and to the levels of these relevant economic indicators before and after the economic crisis can help to understand some peculiarities of this phenomenon.

As shown in Figure 1, NEETs are more widespread in countries with lower labour productivity and per capita GDP (the correlation coefficients among NEETs and these indicators were −0.622 and −0.637, respectively, in 2005; −0.542 and −0.523, respectively, in 2016). A significant and positive correlation emerges instead between the share of NEETs and total unemployment rates (0.457 in 2005, which increased to 0.607 in 2016). This correlation is still higher when the unemployment rates are calculated by including the active population only (0.550 in 2005 and 0.655 in 2016) or young people (0.612 and 0.759, respectively). The increase in these positive correlations after the economic crisis shows that the disparities across European countries has grown. The recent study by Pricewaterhousecoopers (2017) is perfectly in line with these results. Using OECD data, they ranked countries in relation to the PwC Young Workers Index, which measures the condition of young people in the labour market. Countries at the top of the list for the best

conditions are those with higher per-capita GPD, and more investments in education, especially in the sphere of digital literacy and on transferable skills, such as mathematics. Italy comes out at the bottom of ranking.[1] The share of NEETs is also positively and significantly related to the share of at risk of poverty population, and this correlation increased overtime, from 0.492 in 2005 to 0.790 in 2016. Even if the status of NEETs seems mainly related to the scarce labour opportunities, it clearly depends also on the share of inactive youth. Indeed, the relationship between the share of NEETs and the propensity of population to participate to the labour market is inverse and increased overtime. Due to the structural differences in the participation rates of men and women, an analysis according to gender becomes useful. Despite the recent increases, the female participation rates are still lower than the male ones in most European countries, with strong differences across them. In 2016, the share of inactive women ranged from 33.2% in Italy to percentages lower than 12% in Slovenia, Sweden and Lithuania. Despite this, in 2015, Italy showed a number of children per woman of 1.35. Only Poland and the Mediterranean countries of Spain, Portugal, Greece and Cyprus show smaller values, against a number of children per woman for EU-28 of 1.58 (Eurostat on line database, ec.europa.eu).[2] With reference to men, Northern countries show the lowest inactivity rates, while the highest rates are shown by many Eastern and Southern European countries. According to the variations overtime, in the 2005–2016 period, male inactivity rates decreased remarkably in Eastern European countries, while they further increased in Southern ones. The correlations between male and female participation rates on the one hand and the NEET rate on the other side are negative and slightly increasing in their absolute values, from −0.556 in 2005 to −0.625 in 2016 for men and from −0.614 to −0.648 in the same period for women. However, previous analyses based on the Labour Force Survey (LFS) data on the major determinants of inactivity across European countries show that a high share of inactive young people would like to work even if they were not searching due to many reasons, such as discouragement. This latter fact can hide the lack of information, competences, and experience, or can be due to jobs requiring entry level competences (Balan 2015). In Italy, especially in the South, being NEET has multiple and often intertwined causes. Boeri and Garibaldi (2002) estimated that in Italy approximately 45% of those classified as unemployed and 10% of those classified as inactive are actually working irregularly. These percentages should be even higher for young people because of their less contractual power on the labour market, which usually involves precarious and irregular contractual forms that further increased during the crisis (McKay et al. 2012; Duell et al. 2016).[3]

In other cases, young people state being inactive because they have to assist a relative or due to illness. Therefore, the high share of inactive youth, especially in some Southern and Eastern countries, could also denote the absence of adequate services that help disabled persons find work or that assist them. Countries with higher shares of NEETs are also those

1 This index includes the following indicators: the NEET rate, the employment and the unemployment rates, the youth unemployment rate compared to the adult one, the share of part-time employment and of long-term unemployment, school drop-out-rates and educational enrolment rates.

2 As documented by OECD (2016), only the 15.3% of Italian youth have a child.

3 Eurofound (2012, p. 83) highlights that in Italy the lack of identification with the main political actors and the resentment against them due to a lack of answers to everyday problems place NEETs at greater risk of becoming involved in irregular political activity and of expressing their alienation through vandalism and conflict.

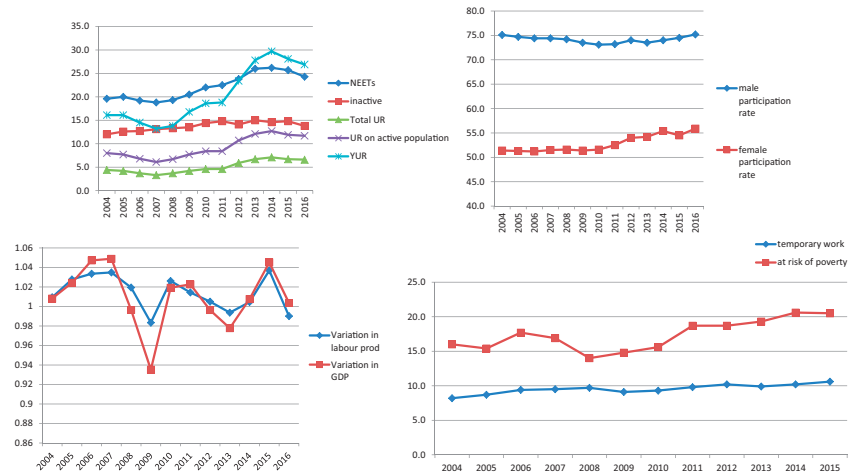

Figure 2. Main economic indicators for 2004–2016 time interval in Italy.

Source: Eurostat on line database.

with higher percentages of young people with self-perceived long-standing limitations in daily activities due to health problems (the coefficient of correlation was 0.414 in 2005 and 0.509 in 2012, the last year available). Nevertheless, no significant correlations arise between the share of NEETs and the share of temporary workers.

Focusing on the Italian labour market, it shows many negative primates. Besides those already exposed, the higher ratio between the youth and the total unemployment rate, the low employment rates, the high levels of long-term unemployment and the spread of the underground economy are some of these. The recent labour market reforms intents of improving the system of active policies and put more young people on the labour market do not seem to have fully reached these goals. Indeed, the analysis over time for the main economic indicators adds other important evidence. The share of inactive youth and NEETs experienced an increase until 2013, followed by a slight decrease in the last years (Figure 2). A similar pattern concerns youth and total unemployment rates. However, the youth unemployment rate was lower than the share of NEETs until 2011. They are the same in 2012, and in subsequent years, the unemployment rate overpasses the NEET rate. In the same years, although female participation rates show greater increases than male participation rates, the gap between these rates remains significant, around 20 percentage points. The variations in labour productivity and in the GDP (calculated as ratios between consecutive years) appear strictly concordant, even if the GDP variation is higher. Finally, a similar increase concerns the share of temporary contracts and people at risk of poverty, while the percentages of involuntary part-time contracts almost doubles, going from 48.2 to 80.4%.

The analysis of the relationships among NEETs and inactive youth on the one hand and some relevant indicators on the other hand observed for Italy in the last decade widely confirms this evidence. To avoid the possibility of inflation by a common trend, the correlations were calculated on data in terms of first differences (Table 1). Over time, the

Table 1. Time correlations among the share of Italian NEETs and inactive from 2005 to 2016 and other economic and social variables[a]

%	(1)	(2)	(3)[b]	(4)	(5)[b]	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
NEETs	−0.320	−0.572	0.357	0.881	0.019	−0, 024	−0, 450	0, 778	0.777	0.790	−0.553	−0.451	−0.019
Inactive	0.367	0.077	0.748	0.067	−0.057	−0.007	−0, 152	0, 595	−0.127	−0.112	−0.397	−0.790	−0.644

[a](1) labour productivity (compensation per employee - PPS); (2) Per Gross Domestic Product at market prices; (3) Illness, measured by the self-perceived long-standing limitations of young people in usual activities due to health problems; (4) Youth unemployment rate; (5) % of at risk of poverty population; (6) Criminality, measured by the number of persecuted persons; (7) % of employees with a temporary work; (8) % of part-time employees wishing to work full time; (9) Unemployment rates on total population; (10) Unemployment rates on active population; (11) Share of people with at least upper secondary educational attainment, age group 20–24 by sex; (12) male participation rates to the labour market; (13) female participation rates to the labour market.

[b]The years of reference are: 2005–2015 for the correlation between NEETs (Inactive) and the share of at risk of poverty population; 2005–2012 for the correlation between NEETs (Inactive) and Illness.

Source: Eurostat on line database.

NEET rate was concordant with unemployment rates and the share of involuntary part-time workers. In contrast, according to the expectation, the increase of the NEETs over time corresponds with a decrease in labour productivity, per capita GDP and the share of people in education. The inverse relation between NEETs and the share of temporary contracts could denote that during a crisis many workers under temporary contracts were laid off. Finally, looking at the correlations with inactivity rates, in addition to the strict link with illness and participation in the labour market, inactivity is significantly and positively correlated with labour productivity, showing that, over time, the variations in inactivity and labour productivity moved in the same direction. The relationships between the variations in the share of NEETs and inactive youth on the one side and the share of at risk of poverty population and the proxy of criminality on the other side were not significant.

3.2 The Italian regional disparities

Within the European framework, the persistence of significant regional disparities justifies the regular production by Eurostat of regional statistics, mainly at the NUTS1 and NUTS2 level. Recent studies highlighted that over the last few decades, while gaps in per capita GDP across countries have narrowed, within their own borders countries are witnessing increasing income gaps among regions, cities, and people (OECD 2016, p. 19). In Italy, the segmentation across territory is very marked, and job opportunities are unevenly distributed among the labour force, with the marginalization of specific segments of the working population, in particular women and young people, especially those residing in Southern regions (Directorate-General for Internal Policies 2014). Analyzing the regional GDP, which is usually used to measure macroeconomic activity and growth, as well as providing the basis for comparisons between regions, the Southern Italian Regions show the lowest level of development. As such, they are more similar to some Eastern European Regions and to the Southern Spanish Regions than to the Northern Italian Regions. Indeed, some of these Northern Italian Regions show the maximum level of economic development, the same reached by Switzerland and many German and Norwegian regions (Eurostat 2015). Structural unemployment and persistent stagnation of productivity are particular strong in the South of Italy. This deep geographical dualism also reflects the weaker performances of young people and women in the labour market. With reference to the indicators related to the youth professional condition and their human capital, for example, in 2015, early school leavers in the Italian Isles were triple those of the North-east regions (22.4% against percentages under 9%, respectively). The share of young people 30–34 years of age who attained at least a 3-International Standard Classification of Education (ISCED) level of education was more than 80% in the North-east and in many regions in the Centre, while in the Southern regions of Campania and Puglia and in the Isles they were around 60%. The unemployment rates for people 15–24 years of age in the South and Isles, between 50 and 60%, were more than double than the unemployment rates of their corresponding peers living in the North-east; in particular, in Emilia Romagna they did not reach 30% [Eurostat on-line database and Italian National Institute of Statistics (ISTAT) data warehouses].

Considering the NEETs, the South of Italy shows the highest percentages as well as a stronger incidence of the phenomenon in the older age classes, that is, those who are

29–34 years of age, showing that in this area the transition from the educational system (school or university) to work is a very long period. In the South, 1 out of 2 young people are NEETs, while in the North and in the Centre, only 1 out of 4 belongs to this category. This evidence suggested the need to analyze the phenomenon separately for each Italian macro-economic area. Furthermore, the already highlighted gender disparities in education and in the labour market suggest the need for distinguishing between females and males in the analyses. The dynamics and issues related to choices and the cycle of life are indeed very different between young women and young men.

4. Data and methods

Data are from the LFS, waves from 2005 to 2016. LFS is currently the main European reference source for comparable and multidimensional socio-economic statistics on employees and working conditions. In order to have an adequate number of observations and detect changes occurred in short time intervals, the reference is to a 4-weekly time interval, constructed through ad hoc elaborations. Therefore, for each year, 13 observations are available, for a total of 156 observations. The LFS is in fact a continuous survey carried out during every week of the year. The number of young people for each time interval is about 1,200, shared by sex and NUTS 1 macro-region.

The analysis of NEETs follows an approach based on the knowledge of the phenomenon from the literature and by the data availability. The changes over time of the NEET indicator can be associated to factors related to the labour market, such as the total unemployment rate, and to the educational outcomes. In particular, in order to describe the young people characteristics in terms of the level of education attained, it is useful to consider the shares of high educated and of early school leavers. Finally, only for women, given that the share of NEETs is linked also to their propensity to inactivity, the share of those declaring to be housewives has been included into the model. Some indicators, such as 'total unemployment rate' and 'share of early school leavers', could also have a time delay in affecting the share of NEETs. Therefore, the analysis of the dynamics of the share of NEETs is based on the econometric construction defined Distributed Lag (DL) model. It is a dynamic model in which the dependent variable behaviour is studied lagging one or more independent variables (Almon 1965).

The DL(q) model is given by

$$y_t = \mu + \beta(L)x_t + u_t \tag{1}$$

where

$$\beta(L) = \beta_0 + \beta_1 L + \ldots + \beta_q L^q$$

which in its extended form can be written as

$$y_t = \mu + \sum_{s=0}^{q} \beta_s x_{t-s} + u_t$$

In addition to the influence exerted by one or more independent variables in different time periods, we have considered that the share of NEETs has some degree of persistence, that is, that the transition from the status of NEETs to a different status is not particularly frequent (Bruno et al. 2014). Therefore, some lags of this indicator have been considered. The Autoregressive Distributed Lag (ARDL) model takes into account these lags (Sargan 1964). The ARDL(p,q) model is given by

$$\phi(L)y_t = \mu + \beta(L)x_t + u_t \tag{2.a}$$

where $\phi(L) = 1 - \phi_1 L - \ldots - \phi_p L^p$
It can also be written as

$$y_t = \mu + \sum_{k=1}^{p} \phi_k y_{t-k} + \sum_{s=0}^{q} \beta_s x_{t-s} + u_t \tag{2.b}$$

The model can be possibly enriched by the inclusion of an autoregressive seasonal component, so to have the Seasonal Autoregressive Distributed Lag (SARDL) model. The SARDL(p,P,q) model is given by

$$y_t = \mu + \sum_{k=1}^{p} \phi_k y_{t-k} + \sum_{K=1}^{P} \Phi_K y_{t-Kf} + \sum_{s=0}^{q} \beta_s x_{t-s} + u_t$$

where f is the seasonal frequency.

Finally, including the effect of r additional variables contemporaneous to y_t, that is z_{1t}, $z_{2t}, \ldots, z_{rt}$, the general form the of the model becomes

$$y_t = \mu + \sum_{k=1}^{p} \phi_k y_{t-k} + \sum_{K=1}^{P} \Phi_K y_{t-Kf} + \sum_{s=0}^{q} \beta_s x_{t-s} + \gamma' z_t + u_t$$

where z_t is the *r x 1* vector of additional variables and γ is the corresponding *r x 1* vector of parameters.

These models are particularly easy to implement because the Ordinary Least Squares (OLS) estimates are appropriate.

Moreover, in order to study if the introduction of the Youth Guarantee Fund produced a significant variation in the dynamics of NEETs, we define the dummy variables

$$g_t = \begin{cases} 0 & t \in T_b \\ 1 & t \in T_a \end{cases}$$

where T_b is the set of times before the introduction of the Youth Guarantee Fund and T_a is the set of times after. The same analysis has been carried out for the Jobs Act.

Finally, the Chow test compares the results of the regression model applied to all the data—defined as restricted model—with the results of the regression models separately run

for the two periods (Chow 1960). The unrestricted model can be then written as a two-regime ARDL model,

$$y_t = \begin{cases} \mu_1 + \sum_{k=1}^{p} \phi_{1k} y_{t-k} + \sum_{K=1}^{P} \Phi_{1K} y_{t-Kf} + \sum_{s=0}^{q} \beta_{1s} x_{t-s} + \gamma_1{}' z_t + u_t \text{ if } g_t = 0 \\ \mu_2 + \sum_{k=1}^{p} \phi_{2k}\ y_{t-k} + \sum_{K=1}^{P} \Phi_{2K} y_{t-Kf} + \sum_{s=0}^{q} \beta_{2s} x_{t-s} + \gamma_2{}' z_t + u_t \text{ if } g_t = 1 \end{cases}$$

The null hypothesis of the Chow test is the stability of the parameters across the two regimes, that is

$$H_0 : \theta_1 = \theta_2$$

where θ_1 and θ_2 are the parameter vectors in the first and second regime, respectively.

To take a decision, we compare the estimated model without the assumption that a change has occurred in correspondence of the introduction of the Fund/Jobs Act and the estimated model that takes into account the feature. The Chow statistics is given by

$$F = \frac{(\text{RRSS} - \text{URSS})/j}{\text{URSS}/(N_1 + N_2 - k)} \sim F_{j, N_1+N_2-k} \tag{4}$$

where RRSS is the restricted residuals sum of squares obtained estimating a unique model for all the period while URSS denotes the unrestricted residuals sum of squares obtained as sum of the RSS of two models, the former considering the N_1 periods before the introduction of the Youth Guarantee Fund, the latter considering the N_2 periods after; finally j is the number of restrictions, and k is the number of parameters of the unrestricted model.

Under the null hypothesis the F-ratio follows the F distribution with j and (N_1+N_2-k) degrees of freedom in the numerator and denominator, respectively. However, the Chow test does not inform us whether the difference in the two models is due to the differences in the constant term, in a single coefficient, in all the coefficients of a variable regardless the lags, or finally in a specific subset of coefficients.

In particular, we are interested in checking if in correspondence of the introduction of these recent initiatives a reduction in the constant term has occurred without any impact on the dependence structure with the other variable, which imply a decrease in the share of NEETs. In this case, the unrestricted model is

$$y_t = \mu_1(1 - g_t) + \mu_2 g_t + \sum_{k=1}^{p} \phi_k y_{t-k} + \sum_{K=1}^{P} \Phi_K y_{t-Kf} + \sum_{s=0}^{q} \beta_s x_{t-s} + \gamma' z_t + u_t$$

where μ_1 is the constant in the first regime, observed before the introduction of the Youth Guarantee Fund/Jobs Act, and μ_2 is the constant of the second regime, characterized by its presence, and the hypothesis to test is H_0: $\mu_1 = \mu_2$.

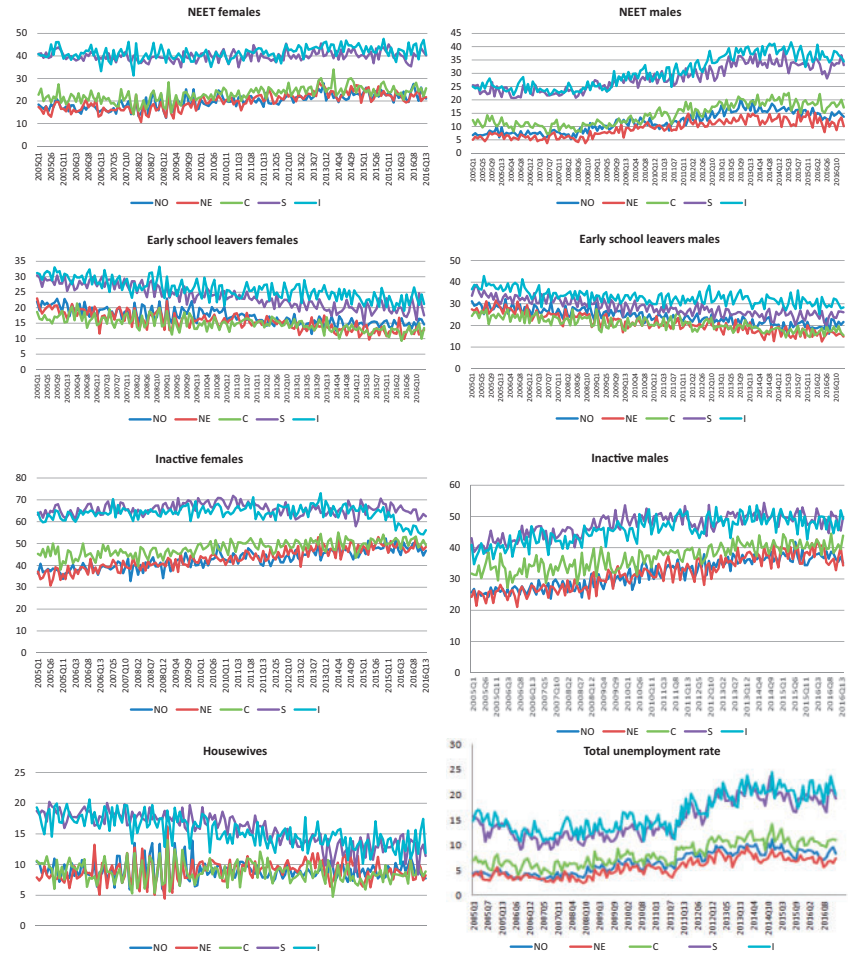

Figure 3. Main economic indicators for 2005–2016 time interval in Italy.

Source: Ad hoc elaborations on LFS (years from 2005 to 2016)

When the Chow test is computed on a subset of coefficients, we can test if the recent initiatives have modified the relation between this set of covariates and the dependent variable. Then the null hypothesis is

$$H_0 : \theta_{1V} = \theta_{2V}$$

where θ_{1V} and θ_{2V} are the parameter vectors of the variable V in the first and second regime, respectively.

5. Results

The analysis of the indicators observed in the NUTS 1 macro-regions shows a clear two-part divide (Figure 3). Indeed, even if the trend is similar, the starting levels for the Centre-

North of Italy on the one hand and the South and Isles on the other are very different. The gap shrinks slightly over time.

The first three rows of Figure 3 show that the gaps are also very marked according to gender. Gender therefore plays a significant role in determining the pattern of these indicators over time. With reference to the share of NEETs, while men experienced a significant increase, that in the North-centre is approximately of 9%, for women the share of NEETs is almost stationary. In addition, the increase of inactive youth is greater in the North than in the South of Italy, reducing the regional gap, especially for women. This result is strictly connected to the reduction in the share of women that in this decade identify themselves as housewives. Indeed, while in the North and Centre, the share of housewives is almost stationary, highlighting a reduction of 2%, in the South and Isles, it shows a marked decrease, from 19% in 2005 to 12% in 2016.

The total unemployment rates highlight a greater variability in the South and Isles. These rates decrease until 2008 and remarkably increase in the subsequent period. However, considering the variation that occurred in the unemployment rates in the 2005–2016 decade, the global increase in the North of Italy is similar to the increase in the South, approximately 4%. Less evident are the regional disparities in the share of early school leavers, especially among males.

The pronounced regional and gender differences noted justify deepening the study of the determinants of the share of NEETs. Regarding this goal, alternative specifications of DL and ARDL models have been implemented. For each regional Italian macro-region, the models have been separately estimated for all the young people, as well as considering exclusively men and exclusively women. Therefore, for each model, we have estimated 15 different regression models.

For the sake of brevity, in this article only one model specification has been reported. The selected model—labelled SARDL (p, P, q)—considers up to three delays for the dependent variable and for the total unemployment rate. The exact number of delays has been driven by the coefficients' significance. Furthermore, to consider the seasonality component of the dependent variable (which was strongly significant almost everywhere), P seasonal lags have also been included into the model. For the share of early school leavers, its moving annual average has introduced in the model too. The additional regressor for females measuring the share of housewives is always positive and significant, improving the goodness of fit. This result confirms the graphical evidence of Figure 3, suggesting that the decrease in the share of female NEETs is strictly connected with the decrease in the share of housewives. For women, two factors acting in opposite senses affected the levels of NEETs. On the one hand, the raise in the unemployment rate provoked an increase in the share of NEETs; on the other hand, during the recession and in response to the loss of a job or to the increased instability in the work conditions of their male counterparts, many women accessed the labour market, even if in most of the cases they occupied only the less qualified jobs, decreasing the share of those who identify as housewives.

Globally, the results highlight a high persistence of the NEET phenomenon over time and the significant dependence of the share of NEETs on the share of early school leavers and on the total unemployment rate (Table 2). The latter variable, being calculated over the entire active population, can be assumed as a proxy of the economic cycle, therefore allows to take into account the economic crisis. In the North-west, the lack of significance of the covariate measuring the total unemployment rate should suggest that in this area being NEET rather than being connected with the economic downturn is related to the status of

Table 2. Seasonal ARDLs for Italian NEETs from 2005 to 2016 by gender and macro-region. Four-weekly time interval for 13 observations each year and a total of 156 observations in each sub-group

	Centre			North-West			North-East		
Neets	F + M	Males	Females	F + M	Males	Females	F + M	Males	Females
$Neets_{(t-1)}$	0.242***	0.254***	–	0.295***	0.231***	0.209***	0.211***	0.059	0.195***
$Neets_{(t-2)}$	0.015	–	–	−0.022	0.246***	0.025	0.129**	0.095	0.030**
$Neets_{(t-3)}$	0.141*	–	–	0.384***	0.444***	0.097**	0.136**	0.195**	0.046
$Neets_{(t-13)}$	0.260***	0.313***	0.338***	0.228***	–	0.283***	0.176***	0.159**	0.152***
$Unempl_{(t)}$	0.578***	0.640***	0.674***	–	–	–	0.840***	0.533***	1.012***
$Unempl_{(t-1)}$	−0.379**	–	–	–	–	–	−0.427***	–	−0.576***
$Unempl_{(t-2)}$	0.234*	–	–	–	–	–	–	–	–
$Early_{(t)}$	0.240**	0.085	0.072	0.310***	0.219***	0.016	0.456***	0.208***	0.249***
$Early_{(m13)}$	−0.353**	−0.232*	−0.311	−0.367**	−0.160	−0.467***	−0.508***	−0.299***	−0.468***
High-$Ed_{(t)}$	−0.156*	−0.085	−0.334***	0.072	0.262**	0.056	0.018	0.035	0.023
Housewives	–	–	0.531***	–	–	0.857***	–	–	0.624***
Constant	7.403*	5.532	13.837***	2.180	−4.340	7.072	3.752	3.301	4.791
F	63.85	133.92	37.80	112.06	153.21	55.80	112.14	71.93	70.22
R^2 Adj.	0.816	0.849	0.609	0.845	0.865	0.755	0.876	0.800	0.830
Chow test for Youth Guarantee Fund									
H_0: $\theta_1 = \theta_2$	2.12**	2.75***	2.74***	2.90***	1.89*	1.80*	3.57***	3.66***	1.00
H_0: $\mu_1 = \mu_2$	3.287*	6.250***	1.355	12.369***	3.758**	0.755	7.165***	8.230***	0.451
H_0: $\theta_{1u} = \theta_{2u}$	1.63	3.39**	4.33***	–	–	–	2.60**	4.10**	0.500
H_0: $\theta_{1N} = \theta_{2N}$	1.43	2.34*	1.39	2.80***	1.119	1.98*	2.88**	2.26**	0.67
H_0: $\theta_{1E} = \theta_{2E}$	3.42***	4.26***	1.849	5.166***	2.751***	0.677	6.022***	6.868***	1.27
H_0: $\theta_{1H} = \theta_{2H}$	–	–	0.686	–	–	−1.536	–	–	0.53
Chow test for Jobs Act									

(continued)

Table 2. Continued

	Centre			North-West			North-East		
Neets	F + M	Males	Females	F + M	Males	Females	F + M	Males	Females
H_0: $\theta_1 = \theta_2$	1.87**	3.73***	2.29**	2.99***	1.43	1.77*	4.03***	4.00***	1.62
H_0: $\mu_1 = \mu_2$	11.93***	17.61***	4.09**	14.27***	8.63***	2.07	11.01***	5.18**	5.18**
H_0: $\theta_{1u} = \theta_{2u}$	4.02***	8.77***	5.21***	–	–	–	4.62***	2.63*	4.02***
H_0: $\theta_{1N} = \theta_{2N}$	3.57***	6.97***	5.68***	3.69***	2.48**	2.00*	2.85**	1.35	1.34
H_0: $\theta_{1E} = \theta_{2E}$	3.42***	5.54***	1.107	4.59***	2.16*	2.03*	5.27***	7.56***	1.68
H_0: $\theta_{1H} = \theta_{2H}$	–	–	2.87*	–	–	1.17	–	–	2.60*

	South			Isles		
Neets	F + M	Males	Females	F + M	Males	Females
$\text{Neets}_{(t-1)}$	0.191**	0.182**	0.018	0.150**	0.292***	0.091
$\text{Neets}_{(t-2)}$	0.102	0.071	0.187**	0.055	0.160**	0.013
$\text{Neets}_{(t-3)}$	0.211***	0.184**	0.228***	0.287***	0.281***	0.203***
$\text{Neets}_{(t-13)}$	0.129*	–	0.221***	0.223***		0.175***
$\text{Unempl}_{(t)}$	0.168*	0.466***	0.084	0.261***	0.279***	0.314***
$\text{Unempl}_{(t-1)}$	−0.307**	−0.278**	−0.227	–	–	–
$\text{Unempl}_{(t-2)}$	−0.106	–	−0.238*	–	–	–
$\text{Unempl}_{(t-3)}$	0.260***	–	0.382***	–	–	–
$\text{Early}_{(t)}$	0.295***	0.240***	0.425***	0.457***	0.373***	0.436***
$\text{Early}_{(m13)}$	−0.635***	−0.860***	−0.668***	−0.413***	−0.387***	−0.570***
$\text{High-Ed}_{(t)}$	−0.158	−0.129	−0.004	0.096	0.357**	−0.022
Housewives	–	–	0.227*	–	–	0.484***
Constant	23.120***	32.355***	16.113*	4.161	1.051	12.691**
F	52.20	107.29	11.03	105.47	171.63	22.74

(continued)

Continued

	South			Isles		
Neets	F + M	Males	Females	F + M	Males	Females
R^2 Adj.	0.799	0.856	0.459	0.855	0.893	0.579
Chow test for Youth Guarantee Fund						
H_0: $\theta_1 = \theta_2$	2.51***	2.17**	2.64***	3.26***	2.32**	1.38
H_0: $\mu_1 = \mu_2$	8.308***	2.603*	3.668**	7.460***	1.527	0.025
H_0: $\theta_{1u} = \theta_{2u}$	2.49**	1.28	2.21*	6.22***	1.33	0.25
H_0: $\theta_{1N} = \theta_{2N}$	3.09***	2.10*	4.22***	1.88*	0.88	0.27
H_0: $\theta_{1E} = \theta_{2E}$	4.409***	1.740	2.710**	4.431***	1.97*	1.97*
H_0: $\theta_{1H} = \theta_{2H}$	–	–	3.366**	–	–	0.45
Chow test for Jobs Act						
H_0: $\theta_1 = \theta_2$	2.87***	1.57	2.59***	2.94***	2.04**	1.53
H_0: $\mu_1 = \mu_2$	3.03*	2.24	1.23	13.15***	4.40**	3.00*
H_0: $\theta_{1u} = \theta_{2u}$	2.51**	0.96	1.99*	9.53***	2.73*	1.57
H_0: $\theta_{1N} = \theta_{2N}$	2.07*	1.87	2.29**	3.08***	2.52**	1.37
H_0: $\theta_{1E} = \theta_{2E}$	4.69***	1.27	3.23***	4.30***	1.57	1.58
H_0: $\theta_{1H} = \theta_{2H}$	–	–	1.74	–	–	2.22

H_0: $\theta_1 = \theta_2$: Chow test on the whole model.
H_0: $\mu_1 = \mu_{2:}$ Chow test on the intercepts.
H_0: $\theta_{1u} = \theta_{2u}$ Chow test on the unemployment covariates.
H_0: $\theta_{1N} = \theta_{2N}$ Chow test on the delays of NEET.
H_0: $\theta_{1E} = \theta_{2E}$ Chow test for the covariates measuring education.
H_0: $\theta_{1H} = \theta_{2H}$ Chow test on the covariate Share of housewives.
***Statistical significance at 1%; **significance at 5%; *significance at 10%.
Source: Ad hoc elaborations on LFS (2005–2016).

early school leaver or housewife to a greater extent. To the contrary, the total unemployment rate and its first delays exert a stronger influence in the South of Italy, in particular for females. Most likely, in these areas, the transition from unemployment status to another status that is different from inactivity is more difficult to achieve.

Less significant is the role played by a high level of education in the determination of the share of NEETs almost everywhere, a phenomenon that is due also to the age classes involved in the study. Conversely, the early school leavers appear strictly linked to NEETs, also considering the delays (Early(m13) measures in fact the annual moving average for the share of early school leavers during the last year). Therefore, we can conclude that a high share of lowly educated young people significantly increases the share of NEETs. Most likely, this is because early school leavers are more likely to become NEETs, while being highly educated is not a prerequisite to being more or less exposed to the status of NEETs.

According to the persistence of NEETs, the coefficients significance shows that it is less strong in the Centre of Italy, when men and women are separately considered, while the seasonality component is not significant for men in Southern Italy (including Isles) and in the North-west. This could depend on the major involvement of women in temporary jobs, which in Italy are found in the tourist and agricultural sectors in particular (Palidda 2009).

The greater irregularity of the phenomenon for women, especially in the Southern regions, finds a confirmation in the lower values of adjusted R^2s. For women, therefore, the dynamics concerning the share of NEETs are more complex, making good estimates more difficult to reach. One reason could be the wider diffusion of informal employment among youths living in the South, with transitions to decent jobs being slow and difficult to achieve (European Commission 2010). Conversely, the low number of children per woman (OECD 2016) suggests that this irregularity is not explainable by having children at a young age.

However, in the last period, some initiatives, such as the introduction of the Youth Guarantee and the Jobs Act, and the overcoming of the deepest phase of the economic crisis modified in many cases the general scenario. Through the Chow test, it is possible verify if in correspondence of the introduction of these initiatives finalized to reduce NEETs some effects have been obtained or not. The results show the existence of significant structural breaks in the NEET time series in many cases.

With reference to the Youth Guarantee, the Chow test on the whole model is always significant, with the exception of women in the North-east and in the Isles. However, in the Isles, when men and women are considered separately, and in the Centre, when females and males are considered together, the significance of the Chow test is associated only to the variables related to education, suggesting that for these groups the decrease in NEET levels is only due to a decrease in the share of early school leavers. This fact can denote that in correspondence of the introduction of the Youth Guarantee Fund there was a significant change in the relation between these variables and NEETs, probably due to the increased supply of training and internship activities associated to the youth guarantee initiatives. In the other cases, when men and women are considered together, the significance of the Chow test referring to the whole model finds confirmation also in the Chow test focused on the subset of variables related to unemployment (when they are included into the model) and to NEETs everywhere. The situation is different in the North-west, where the significance of Chow test on the whole model is mainly connected to the NEET regressors for women, while for men, it seems mainly linked to education. Finally, the Chow test on the constant parameters in the two regimes shows a significant variation in the level of NEETs everywhere when men and women are considered together. This result is always confirmed on the subsample of males (with the exception of the

Isles, while in the South the p-value is just 0.11) while in the South of Italy it is confirmed also for women. Therefore, women in the South of Italy show a marked reduction of the NEET levels, due only to the reduction of housewives.

According to the Jobs Act, it seems have produced some effects especially in the North and in the Centre of Italy, where the tests for both the whole model and specific regressors show a significant change in the coefficients. This effect is weaker only for the women in the North. Conversely, in correspondence of the introduction of job contracts with increasing protections nothing seems have changed for men in the South and women in the Isles. These subgroups of young people can be therefore identified as the less resilient collectives to the reforms finalized to stimulate active participation to the labour market. This result can also be associated to the fewer job opportunities associated with the most economically depressed areas of the country.

6. Conclusions

This study has attempted to provide a theoretical framework to analyze the dynamics characterizing the magnitude of the NEET phenomenon in Italy in the years of economic crisis. According to its complexity, the analysis aimed to identify the main determinants of NEETs, which were split for homogeneous sub-sets of young Italians in relation to the area of residence and gender.

In addition to the economic downturn, measured by high levels of unemployment, other factors maintain high the level of NEETs. The high share of early school leavers is, for example, a warning light on the NEET condition. The strong persistence of the phenomenon highlighted by the SARDL models shows the difficulties in exiting this condition, which can evolve into long-term unemployment and social exclusion. The initial analysis of NEETs in the European countries highlights the strong inverse correlation between the levels of productivity and per capita GDP, on the one side, and the levels of NEETs, on the other side. Furthermore, among EU member states, the Italian condition of the youth population is the worst one with respect to many issues. In addition to the highest share of NEETs, high percentages of early school leavers and low levels of highly educated youth, Italy shows also the highest inactivity rates. This can explain why Italy shows higher levels of NEETs despite the fact that other countries, such as Greece and Spain, share the highest levels of unemployment, also in the youth age class. Indeed, the reasons for being NEET are ascribable to unemployment or to inactivity. While unemployment is related to the economic cycle and to the institutional and socio-economic national framework, the causes of inactivity are more connected to the different propensity to work and find their roots in the low levels of education, in a condition of social exclusion or in a major propensity of engagement in the irregular and/or criminal economy. From a gender perspective, Italy shows, within the European framework, the less female propensity to work. It is first of all a cultural issue, that only recently has begun to change. Finally, high rates of inactivity among young people are also linked to discouragement. For a young person, more prolonged is the period experienced as NEET and higher is the probability of falling into a chain of low pay, temporary or part-time work (Pastore 2014). Furthermore, the NEET condition produces damaging effects on human capital accumulation (Caroleo 2012), encouraging therefore inactivity.

The econometric analysis shows that in correspondence of the recent labour market reforms, such as the introduction of Youth Guarantee Found and the Jobs Act, contextually

to the partial recovery of the economy after the 2008 economic crisis, there was a reduction in the share of NEETs. However, the strong dependence of NEETs levels from the variables linked to education highlights the need to improve the school to work transition process and to act improving the education system efficacious. Indeed, the inefficiency of the transition process from education to work, the segmentation of the labour market, and low investments in education and innovation contribute to keep the share of young people able to acquire an economic independence at low rates.

In this economic scenario, many young people fall in the NEET condition or migrate. According to the Fondazione Migrantes' data (2016), in 2015, more than 100,000 Italians chose to move to another country. They are above all highly educated, between 18 and 34 years of age and, contrarily to the past, many of them come from the prosperous North of Italy.

Involving more young people in education, in training or apprenticeship programs, creating the conditions for social inclusion, especially for the more disadvantaged ones, has become therefore an absolute priority in order to promote the economic growth. At this aim, any initiatives finalized to close the gap between school and labour market and active labour market policies could help young people to overcome the difficulties to approach an even more complex labour market.

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