Navigating the early-career: The social stratification of young workers' employment trajectories in Italy

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Abstract
This paper contributes to the debate on early-career precariousness and inequalities against the backdrop of labour market deregulation. The analyses focus on a cohort of young Italian workers who entered the labour market after the deregulatory reforms of the late 1990s and early 2000s. Instead of looking at the timing of isolated transitions between employment states, 7-year-long trajectories are considered to identify differences by gender and education in the probability of experiencing more stable and protected early-careers. Italy is a particularly interesting country-case because of its high youth unemployment rates and difficult school-to-work transitions into the protected labour market segment. The analyses draw on AD-SILC, a unique data source that combines administrative records of complete employment histories and survey data and offers an unprecedented, highly detailed distinction between a wide range of non-standard employment relationships. Applying sequence analysis, eight early-career types characterized by different degrees of employment continuity and stability are identified. Multivariate logistic regression estimates show that women— especially if lower-educated—are more likely than men to experience pathways characterized by instability and weak (or absent) employment and social security protection, that ultimately lead to more precarious early careers.

Keywords: gender, education, Italy, deregulation, individualization, employment instability, sequence analysis, optimal matching

Highlights
- Studying the dynamics of employment trajectories requires a longitudinal perspective
- AD-SIL data offers an unprecedented, highly detailed distinction between non-standard employment relationships
- Sequence and cluster analysis identifies eight early-career types with varying degrees precariousness
- Women—especially if lower-educated—are more likely than men to experience precarious early careers

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1. Introduction

Since the late 1970s, European labour markets have gone through extensive deregulation. According to the political discourse, deregulation was expected to foster smoother transitions into the labour market and stabilize employment for young and weakly attached workers, typically women and low-skilled individuals. However, against a backdrop of economic globalization (Blossfeld et al., 2005), company restructuring after economic crises (Kalleberg, 2009), and job loss due to technological change (Oesch & Rodríguez Menés, 2010), some authors argue that deregulation has promoted participation through increasingly less stable and secure employment trajectories (Kalleberg, 2012).

The paper contributes to the literature on the social stratification of labour market experiences considering whether differentials by gender and education exist in the probability of experiencing precarious early careers in highly deregulated systems. One perspective—known as the individualization of risk perspective—suggests that the increased uncertainty in employment driven by globalization affects all individuals equally (Beck, 1992; Sennett, 1999) and leads to a generalization of highly unstable and unpredictable careers. A contrary perspective, the persistent inequality perspective, argues that classic inequality patterns based on gender and educational attainment continue to shape individuals' exposure to labour market risks (Breen, 1997; Goldthorpe, 2002). The ongoing process of recommodification of risk linked to labour market deregulation is expected to especially affect workers who are more exposed to market fluctuations—typically new entrants, and, within this category, low educated individuals and women. Women have become more educated than men in most rich Western societies, but the persistence of gendered norms in the family and in

the workplace might affect labour market outcomes even before actual family formation has occurred. Because the effect of education has been shown to be larger at the beginning of individuals' occupational careers, it is crucial to focus on this career phase in order to understand whether gender-specific patterns emerge and differ by educational level.

The classical research on vertical and horizontal segregation by gender and education has been more recently enriched by evidence on whether non-standard employment arrangements[1] trap workers in precarious situations rather than acting as a stepping-stone toward stable jobs (Giesecke & Groß, 2003). However, the identification of such differentials in longitudinal dynamics cannot rely on 'point-in-time' outcomes, cross-sectional indicators, or trend outcomes only (for instance, the probability of job loss or the timing and quality of the first permanent job; see, for example, (Blossfeld et al., 2015). The life-course literature suggests that identifying specific forms of inequality (in this case) in labour market trajectories is only possible when conceptualizing them as 'process outcomes', that is as they unfold over time (Abbott, 2016). For instance, when taking a shorter-term perspective, researchers may regard one short spell of transitory unemployment as relatively minor; yet recurrent unemployment and downward spirals are only visible in a longer-term processual perspective.

The Italian case is particularly interesting when considering whether social stratification by gender and education in early-careers exists as it is characterized by an institutionally driven insider–outsider scenario (Palier & Thelen, 2010). Between

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[1] The 'standard employment relationship' generally refers to an employment relationship that is full-time, open-ended, and based on a direct subordinate and bilateral employment relationship between an employee and employer. This definition comprises: temporary and part-time employment, multiparty employment relationships, and dependent self-employment (ILO, 2017).

the 1990s and the 2000s, Italy experienced flexibilization reforms that reduced labour market rigidities by introducing non-standard contracts and lowered the employer's cost for terminating standard, open-ended contracts. The Italian economic model was traditionally characterized by high rates of youth unemployment, low rates of female participation, and a sizable proportion of individuals working in the informal economy. The deregulation process was promoted on the grounds that it would increase labour market participation among groups who found it difficult to enter and stay in the labour market. However, the implementation of flexibilization reforms 'at the margins' targeted new entrants and emphasized the age/cohort divide (Barbieri & Scherer, 2011; Golsch, 2003) might have disproportionally affect those who already had a weaker position in the labour market. This disadvantage has so far been studied in terms of horizontal and vertical segregation in the first job (Barbieri et al., 2015; Dämmrich, 2015) or time to stable employment and persistency in temporary employment (Barbieri et al., 2016). The literature generally lacks of solid descriptive knowledge about the heterogeneity of early careers understood as 'process outcomes', that is accounting for the multiplicity of trajectories' configurations made possible by the introduction of non-standard contractual arrangements.

The analyses focus on a specific cohort of workers who entered the labour market between 1998 and 2001 and whose early careers took place after the core of the deregulation phase was over. Sequence analysis techniques are applied to a unique longitudinal data source (AD-SILC) that combines administrative longitudinal records on complete employment histories and survey data from the Italian module of the European Statistics on Income and Living Conditions (EU-SILC). AD-SILC's administrative component allows for making an unprecedented, highly detailed distinction between a wide range of non-standard employment relationships

individuals may experience over time. Although limited to the Italian case, these evidence fill this gap by identifying early career pathways characterized by different degrees of long-lasting precariousness and associates individuals characteristics to differentials in the likelihood of experiencing them. This evidence contributes to the general understanding of how early-careers are stratified in highly deregulated labour markets and may inform future research on countries that share the same institutional setting and/or where further deregulation is in place.

2. The Italian institutional context

On the macro-level, the Italian context was characterized until recently by a loose education-occupation link, high employment protection, low internal and external mobility, collective protection provided by the welfare state, few government employment policies, limited provision of low quality family services, and targeted (means-tested) welfare provisions (Ferrera, 1996; Saraceno, 2013). In Italy, the young workforce between ages 15 and 24 was exposed in the last decades to high rates of unemployment for two reasons: demographic changes—i.e. an aging population and the associated changes in the pension system (Sartor, 2010)—and educational dynamics—i.e. increasing educational opportunities along with a low availability of high-skilled jobs (Barone & Schizzerotto, 2011; Checchi, 1997). The cohort of interest for this paper entered the labour market between 1998 and 2001 and workers were observed for 7 years after the first employment episode. During this timespan, the unemployment rate for workers aged 15–24 slowly but steadily decreased from 29.9% in 1998 to 21.2% in 2008. However, as in other Mediterranean countries, newcomers to the labour market—typically young people and women—experienced greater

barriers to entering jobs in the core segments; they experienced difficult school-to-work transitions (Brzinsky-Fay, 2007) and were generally overrepresented among those holding non-stantard contracts (OECD, 2017).

2.1. Labour market deregulation reforms

Between the 1970s and the 2000s, the Italian employment cycle was characterized by two phases of expansion (1983–1990 and 1994–early 2000s), interrupted by a recession between 1991 and 1993. Employment and employment productivity decreased again starting from 2000. During this very period, several labour market reforms were introduced. These aimed to promote flexible contractual arrangements and relax highly protective regulations in line with the European employment strategy pursued since the 1990s (Goetschy, 1999).

The reforms promoted part-time employment, increased the maximum age for apprenticeships, relaxed regulations governing on-the-job training (e.g. internships), and facilitated the re-integration of long-term unemployed workers (Law 452/1994). In 1995, the National Social Security Agency (INPS) established a special pension fund—the *Gestione separata*—for para-subordinate workers, i.e., dependent self-employed and professionals whose professional organizations did not provide a dedicated pension fund.[2] Para-subordinate workers were entitled to the lowest degree of social security rights and paid a reduced pension contribution rate.

In 1997, the *Pacchetto Treu* (Law n.186/1997, legislative decree n.386/2001) made fixed-term contracts available to a wider range of sectors and providers of

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[2] For a description of the characteristics of para-subordinate workers in Italy and of the welfare guarantees provided in para-subordinate working arrangements, see Raitano (2018).

professional services and relaxed restrictions on the extended and repeated use of temporary contracts. Finally, the *Biagi Law* in 2003 (n.30/2003, legislative decree n.276/2003) deregulated a greater number of private sector employment relationships (on-call workers, staff leasing, and job sharing). [3]

The reforms also affected the public sector. From the mid-1990s, severe restrictions on permanent hiring were introduced to reduce public spending. The massive use of non-standard contracts for outsourced services after the aforementioned reforms especially affected young workers' chances of accessing permanent and full-time contracts in the public sector (Dell'Aringa et al., 2007). As a result, the public sector in 2008 in Italy represented 14.4% of the employed labour force, that is smaller than the European average.

2.2. Macro- and micro-level outcomes of deregulation

From a macro-level perspective, the reforms have led to a substantial decrease in the OECD employment protection legislation (EPL) index for temporary workers, from 5.25 in the late 1980s, to 3.25 in 2001, and 2.00 in 2003, while the OECD EPL index for permanent workers has remained constant at 2.76 since the 1980s. Italy— which ranked fourth as the most rigid within the EU15 countries in 1995—had the highest decrease in the EPL index in the OECD between the mid-1990s and 2008. At

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[3] The rigid set of conditions governing temporary hiring under the previous regulation (peaks in production or replacement of workers on sickness or maternity leave) was replaced by a more general and non-specific rule that permits hiring on a fixed-term basis for 'technical, productive, organizational or substitution' reasons. Two reforms reduced protection for standard workers in cases of unfair dismissal—in 2012 and 2015—and fixed-term contracts were further deregulated in 2014. Because the empirical analyses refer to the period pre-2008 economic crisis, these reforms did not affect the early labour market participation of the individuals entered into the labour market between 1998 and 2001 and followed for the following seven years.

the same time, the share of workers enrolled in trade unions fell. According to the OECD[4], union density steadily rose from 1960 to 1978, from 24.7% of the labour force to 50.4%; after 1978, it fell constantly, reaching 33.4% in 2008.

Considering micro-level indicators, the increase in non-standard arrangements in Italy from the mid-1990s to the mid-2000s was linked to a rise in the share of employees hired on temporary contracts—from 6.2% in 1998, to 7.2% in 2002, to 10.0% in 2008—and on part-time contracts—7.2% in 1998, 8.5% in 2002, and 14.1% in 2008. Among workers aged 15–29 the share of fixed-term employees rose from 9.7% in 1983, to 11.4% in 1993, and to 32.0% in 2008. Moreover, dependent self-employed (para-subordinate) individuals among labour market entrants were 5% in 1996 and increased to 15% in 2008. Women are overrepresented both in part-time jobs and in other non-standard contractual arrangements.[5]

In Italy, the 'partial and selective' flexibilization process (Esping-Andersen & Regini, 2000) has established strong age/cohort inequalities in accessing protected labour market segments (Barbieri & Scherer, 2011; Golsch, 2003) rather than inequalities based on skills differentials (Gebel & Giesecke, 2009; Giesecke & Groß, 2003). The combination of educational expansion and low labour demand for skilled workers has resulted in relatively low education premiums in the labour market (Barone & Schizzerotto, 2011; Fullin & Reyneri, 2015).

These facts, however, overlook a crucial dimension of inequality associated with the stability and volatility of individual employment trajectories, one that might operate above and beyond the effects of isolated individual characteristics on the probability of holding a non-standard contract. In the following, working hypotheses

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[4] See the Visser database available at
https://stats.oecd.org/Index.aspx?DataSetCode=TUD.
[5] Data are from Eurostat, as of December 2018.

on employment trajectories based on classical theoretical perspectives on the differential effects of labour market deregulation will be outlined.

3. Background and Theory

3.1. Deregulated labour markets and careers

The prevalence of specific flexible arrangements differs greatly across countries, as do their effects (Gebel & Giesecke, 2016), partially as a consequence of different school-to-work transition systems (Brzinsky-Fay, 2007; Brzinsky-Fay & Solga, 2016; Scherer, 2001). Studying labour market participation in contexts characterized by varying degrees of deregulation, the economic and sociological literature has explored the 'trap *vs.* stepping-stone effect' of temporary contracts (and in general of non-standard labour market arrangements), mostly by considering the occurrence and the timing of transitions between single events, for example, from temporary to permanent contracts.[6] 'Job insecurity' refers to unstable contractual arrangements (Doeringer & Piore, 1971). These largely affect non-standard workers, who face high barriers to accessing the core segments of the labour force in dual labour markets (Barbieri & Cutuli, 2016; Gebel & Giesecke, 2016). If such conditions persist over

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[6] A stepping-stone effect of temporary contracts for the younger cohorts of workers was found for the UK (Booth et al., 2002), Germany (Gebel, 2010), France (O. Blanchard & Landier, 2002), Belgium (Cockx & Picchio, 2012) and Switzerland (Gebel, 2013). Mixed evidence on the trap-effect was found for the US (Autor & Houseman, 2010), Spain (Polavieja, 2005) the Netherlands (de Lange et al., 2014) and Italy (Barbieri & Scherer, 2009; Barbieri et al., 2016). For Italy, temporary contracts represent a better stepping stone to a permanent job than long-term unemployment (Barbieri and Cutuli, 2016; Berton et al., 2011; Ichino et al., 2005; Lilla and Staffolani, 2012) but—as for other European countries—this only applies to highly educated workers (Barbieri and Scherer, 2005; Gebel and Giesecke, 2016; Giesecke and Groß, 2003; Ortiz, 2010).

time, the resulting precariousness becomes an inherently longitudinal characteristic of individuals' working trajectories (Berton et al., 2009; Hollister, 2011; Wilthagen & Tros, 2004).

Two main theoretical perspectives discuss the effects of deregulation on employment trajectories against the backdrop of globalization: the *individualization of risks* and the *persistent inequality* perspectives. Proponents of the first perspective (Beck, 1992; Rosanvallon, 1995; Sennett, 1999) argue that the ongoing globalization process has led to diffuse uncertainty, especially in labour market participation. The assumption is that employment trajectories are characterized by increasing unemployment and job mobility: according to this perspective, unstable patchwork careers will characterize individuals' in the labour market regardless of the traditional social stratification dimensions, that is, gender, age, and education (DiPrete & Nonnemaker, 1997; Heery & Salmon, 2000).

The concept of recommodification of risk (Breen, 1997) is central to the persistent inequalities perspective. This notion refers to globalization-linked organizational restructuring processes: employers manage the increasing volatility by transferring market risks to their employees. However, recommodification especially affects groups that have access to fewer resources: these forms of inequality in exposure to the risks triggered by high levels of flexibility build on more traditional cleavages, such as education and gender. The increasing skill requirements affect employees differently depending on their human capital because skill-biased technological change has reduced the relative demand for low-skilled workers (Bound & Johnson, 1992; Katz & Murphy, 1992). In line with this, some researchers have argued that jobs based on labour contracts are more likely to expose young workers to market fluctuations and labour market risks than those regulated by service

relationships (Blossfeld et al., 2005; Breen, 1997; Goldthorpe, 2002). This occurs because jobs based on labour contracts are less demanding in terms of the progressive adjustments in obligations they require employees and employers to have and the necessity for performance-related pay. Against the idea of 'boundary-less' career shaped by diffuse uncertainty for all workers (Arthur & Rousseau, 1996), King and colleagues (2005) emphasize that recommodified highly deregulated contexts careers are 'bounded' by the persistent importance of early careers, occupational identity, and institutional constraints.

3.2. Careers as trajectories: the contribution of a processual perspective

Most of the research on the consequences of labour market de-standardization relies on cross-sectional indicators on working statuses at various time points (e.g. the probability of being unemployed or in a non-standard employment arrangement in year *t*). These approaches study 'point-in-time outcomes' (e.g. the probability of job loss or of labour market re-entry after unemployment). However, this narrow approach in terms of the temporal dynamics of labour market participation might lead researchers to overlook how the institutional setting shapes employment trajectories as they unfold over time. Individual experiences in the labour market should thus be conceptualized as 'process outcomes' (Abbott, 2016), as these trajectories are the global result of multiple single events that are sequentially linked (e.g. the complete succession of different jobs within a career).

The concept of a career implies a continuous negotiation between individuals and the labour market opportunity structure. This is an intrinsic dynamic process that requires analytical definition in its temporal duration and sequential order over time.

The methodological tools provided by the sequence analysis (SA) framework are suitable for addressing the analysis-related challenges connected to this perspective on careers and for addressing longitudinal processes in general.

SA was introduced to the social sciences from biology, where Abbott used it to study strings of DNA in the 1980s (Abbott, 1983; Abbott & Forrest, 1986). The analogy to DNA in the social sciences is social processes unfolding over time as sequences of categorical states/events. A detailed presentation of the technique will be provided in section 5. The aim of considering sequences as a whole as units of analysis is to describe sequence structures, classify them according to similarity and thus identify regularities and patterns. Sequence analysis can therefore be understood as a suitable tool for reducing existing imbalances between the core concepts of transition and trajectory, which are typical for life-course research, by bringing the actual temporal unfolding of trajectories and careers back into the study of life-course processes. [7]

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[7] Sequence analysis has been applied to a variety of social processes, but prominently to those related to life-course domains. Some examples include employment trajectories (Day, 2018; Raitano & Struffolino, 2013), family formation trajectories (Struffolino et al., 2016; Van Winkle & Fasang, 2017), transitions/pathways to adulthood (Bras et al., 2010), school-to-work transitions (Brzinsky-Fay & Solga, 2016), work-family careers (Silke Aisenbrey & Fasang, 2017; Borgna & Struffolino, 2018), socio-economic background and educational pathways (Laganà, Chevillard, & Gauthier, 2013), trajectories of prosecution during World War II (Mercklé & Zalc, 2014); time-use (Lesnard, 2006), residential trajectories (Stovel & Bolan, 2004), retirement pathways (Fasang, 2010) and the intergenerational transmission of family formation patterns (Fasang & Raab, 2014). With regard to macro-level processes, researchers have used sequence analysis to analyse the timing of policy adoption (Abbott & DeViney, 1992), the development of family models (Levy et al., 2002), changes in the rhetorical structure of sociological articles (Abbott & Barman, 1997), and cultural processes (Stovel, 2001).

4. Research questions and hypotheses

This paper addresses the question of whether and to what extent the relative contribution of gender and education (and their combination) play a role for the early career configurations of workers entering a highly deregulated labour market such as the Italian one. Cross-country studies that include many countries necessarily offer a somewhat superficial perspective on the interaction of individual characteristics and institutional driving forces; these can be disentangled more effectively in country case studies (Mayer, 2005).

The literature exploring longitudinal patterns of labour market participation is limited with regard to the research question addressed here for a number of reasons: first, many studies only consider relatively old cohorts of workers (Anyadike-Danes & McVicar, 2010; Biemann et al., 2011; Bozzon, 2008; Malo & Muñoz-Bullón, 2003; Van Winkle & Fasang, 2017) or focus on specific subgroups, either men or women (e.g., Simonson et al., 2015; Simonson et al., 2011) or individuals with specific educational level (Middeldorp et al., 2019); second, they consider short timespans within employment trajectories (Bison et al., 2010); or, third, when including younger cohorts, some studies tend to explore the school-to-work transition in a cross-country comparative framework (Brzinsky-Fay, 2007; Brzinsky-Fay, 2014; Scherer, 2005). In these latter cases, the time spent in education is regarded as part of the school-to-work transition process, so that education cannot be used as an independent variable to 'explain' the unfolding of the subsequent trajectory in the labour market.

Research question 1: Typical early-career trajectories

The first research question is an explorative one and seeks to identify the heterogeneity of longitudinal dynamics of early careers by taking into consideration when and for how long a variety of employment arrangements are experienced in the first phase of active labour market participation. More specifically, I will identify a typology of early-career pathways for young workers who entered the labour market in a highly deregulated system.

In cross-country comparisons, Italy stands out as for the high share of young workers experiencing a 'failure' school-to-work transition, characterized by multiple unemployment episodes and inactivity but also low levels of volatility (Brzinsky-Fay, 2007; Quintini & Manfredi, 2009). This in confirmed by additional evidence showing that—compare to Germany and the UK—in Italy the first job search is protracted but once jobs have been found they are stable (Scherer, 2005). Comparisons across cohorts reveal that the youngest cohorts experience stronger persistency in temporary employment (Barbieri et al., 2016) and are exposed to higher levels of early career' volatility (Struffolino & Raitano, 2019), even when considering a small number of possible labour market states that do not distinguish temporary and para-subordinate employment from dependent employment.

In general, all these approaches tend to disregard the potential heterogeneity in entry pathways within the cohort of workers who were exposed to a wider range of employment and contractual arrangements. Considering this specific cohort and being able to account for such multiplicity of employment and contractual arrangements, it can be foreseen that *the descriptive typology will include early careers characterized by stability in one state but possibly with different degrees of employment protection,*

and others characterized by multiple of occupational experiences and varying amount of joblessness episodes (hypothesis 1).

Research question 2: The social stratification of early careers

The second research question concerns the probability of experiencing different early-career trajectories by gender and education.

The individualization hypothesis predicts no differences by traditional stratification factors in the likelihood of experiencing diffuse uncertainty in a context that has been shaped by processes associated with globalization and deregulation. Specifically, *gender and educational level are not expected to play a role in the probability of entering the labour market through pathways characterized by non-standard employment arrangement and overall higher precariousness (hypothesis 2).*

On the contrary, the persistence of inequality hypothesis suggests that those very stratification factors are associated with differentials in the instability of early careers. For what gender differences are concerned, the gendered master status hypothesis (Krüger & Levy, 2001) suggests that labour market deregulation combined with the persistence of traditional family formation processes would preserve the *status quo* of gender differences in labour market participation. Institutional and cultural factors (Crompton, 1999, 2002) would shape a gendered model of labour market participation. On the one hand, even at the beginning of their career, women may anticipate and/or fulfil the requirements of their gendered master status, which is characterized by a stronger commitment to family (in the present or for the future) than would be the case for men. Additionally, this mechanism could be reinforced by employers, who are reluctant to invest in women's early careers because employers anticipate lengthy and/or frequent breaks in their employment participation. Therefore,

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in a highly deregulated labour market and against the background of a familistic welfare state (Saraceno, 1994) and traditional gender roles attitudes (Craig & Mullan, 2010; Lomazzi, 2017), *women are expected to avail of non-standard work options (part-time, temporary, seasonal contracts) more often and for longer periods of time than men (hypothesis 3).*

With respect to differences by educational attainment are concerned, two complementary processes have to be considered. First, in a context characterized by educational expansion, workers who enter the labour market not having completed more than lower secondary education (35% of the school leavers in 1992, 25 in 2001, 20% in 2008)[8] represent an increasingly selected population. Second, the skill-biased technological change (DiPrete et al., 2006) and the strong segmentation of the labour market reduce the opportunities for less educated workers for both accessing the primary segment (Gebel & Giesecke, 2011, 2016) and stabilization in the short run (Hollister, 2011; Solga, 2002). Therefore, *the negative effects of widespread non-standard employment arrangements on early careers in terms of instability and precariousness are bigger for workers with less human capital (hypothesis 4).*

The disadvantage associated with lower education *is expected to be especially strong for lower educated women, compared both men with the same human capital and more educated women (hypothesis 5).* In fact, because women have caught up (and even overtaken) men in educational attainment in the last few decades (OECD, 2015), on the one hand, human capital resources are expected to have prompted an equalizing of highly educated women's and men's early-career chances; on the other hand, this process resulted in an increasing negative selection of women into lower education.

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[8] Data from Eurostat, as of April 2019.

5. Data and Methods

5.1. Data, sample, and analytical strategy

The analyses use the AD-SILC data, a retrospective, unbalanced panel dataset that associates longitudinal records on complete employment histories from the registers of the Italian National Institute for Social Security (INPS) to individuals interviewed in the 2005 sample of the IT-SILC (the Italian module of the EU-SILC survey - European Union Statistics on Income and Living Conditions) by using fiscal reference numbers. The initial AD-SILC sample consists of the 43,388 individuals older than 15 years old in the 2005 IT-SILC wave who experienced at least one employment episode registered by INPS between 1940 and 2009. I selected a subsample of individuals who experienced their first employment episode between 1998 and 2001. This restriction was necessary for several reasons. First, these individuals entered the labour market after 1997 and therefore their early-career unfolded in a deregulated system (having the most crucial measures been introduced in 1997). Second, although the extraction of the INPS registers includes the years between 2005 and 2009, I retained information only until 2007 for individuals entered in 2001 to make sure not to capture any of the effect of the economic crisis started in 2008. Finally, AD-SILC allows distinguishing between fixed-term and permanent contracts in the private sector for the first time in 1998, and para-subordinate arrangements were only identified as such from 1996. Unfortunately, this information is not available for the cohorts of workers who entered the labor market before then: being the focus of this paper on early-careers in a highly deregulated context,

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identifying the specific type of (flexible) contracts/labor market arrangement is crucial. I further selected those who were 15 to 34 years old at the first episode.[9] The final analytical sample counts 2,616 individuals.

AD-SILC offers several advantages over any other longitudinal dataset available for Italy. First, in contrast to retrospective survey data, the retrospective information on employment episodes comes from INPS registers and it is therefore not affected by memory bias (Assaad et al., 2017; Manzoni et al., 2010) and it is attrition free. Second, AD-SILC contains information on all possible employment types, including self-employment and dependent self-employment: this represents a crucial advantage compared to other available datasets extracted from the INPS registers, which are restricted, for example, to employment in the private sector. Finally, being the INPS data linked with IT-SILC implies that crucial information that is usually missing in administrative data is available in AD-SILC, for instance, on the highest educational level attained.

The analytical strategy consists of three steps. First, sequence analysis is applied to construct early careers as sequences of categorical states (i.e. employment statuses) and to cluster them so that a typology of early careers could be identified. Second, a

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[9] Two characteristics of the Italian context support the choice of including in the analyses individuals who entered the labour market at a very young age. First, the age of compulsory schooling is 14 (during the brief period between the school years 1999/2000 and 2002/2003 it was raised to 15). Second, between 1998 and 2001, 25% of the Italian population aged 18 to 24 did not hold a an upper-secondary qualification, including certificates from vocational training (Eurostat, 2014) meaning that they left the school system around age 14-16, as the majority of those who drop out does it either in correspondence of the transition between lower secondary and upper secondary or after the first 1 or 2 years of upper secondary education. In the AD-SILC sample used for the analyses, almost 10% of the workers entered the labour market 15-19 years old, and around 27% had at most lower secondary education when experiencing the first employment episode. The literature shows that in Italy high school dropout concern more young boys compared to girls (Borgna & Struffolino, 2017): because early careers in light of gender differences are at focus here, keeping these very young workers in the analysis is highly important from a substantive point of view.

complexity index (introduced in detail below) is calculated for each cluster identified in the previous step to account for the instability of the trajectories by gender and education. Finally, multinomial logistic regression models estimate the probability of experiencing each early career cluster by gender and education as well as their interaction.

5.2. Sequence analysis for the identification of clusters of typical early-careers

I reconstructed 84-month-long individual sequences representing early careers based on the beginning and ending date of each job and started with the first employment spell longer than 12 weeks.[10] As a result, individual observational windows start at different ages depending on when the highest educational level was attained: as noted above, this allows me to correctly account for differences by education level, which would not have been possible if individual sequences were aligned according to other criteria such as age or a specific calendar year.

Each month within the sequences was coded according to the individual's occupational and contractual arrangements and the data in the specific pension register (Table 1).[11] AD-SILC does not allow identifying fixed-term and permanent contracts in the public sector. Moreover, AD-SILC shares with other register data the limitation of not distinguishing between unemployment without benefits and inactivity; therefore, months spent in unemployment (with and without benefits) or inactivity had

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[10] In Italy, 13 weeks is the minimum to access unemployment benefits.
[11] When the month when one episode ends overlaps with the month when the next one starts, the more 'beneficial' episode in terms of stability and related benefits was prioritized when coding that specific month: for example, working episodes were prioritized over non-employment.

to be all coded as *joblessness*.[12] The dependent self-employed status identifies periods in which para-subordinate employees contributed to the pension register. Months of self-employment in positions other than administrative and prestigious professions were coded as dependent self-employment (Berton, Pacelli, & Segre, 2005; Raitano, 2007).

(Table 1 here)

The early-career sequences were then clustered to identify typologies or pathways.[13] The input for the cluster analysis is a pairwise dissimilarity matrix between sequences computed using the optimal matching (OM) algorithm. OM calculates the distance between two sequences on the basis of the costs associated with three types of operations that are used to align the paired sequences (that is, the transformation of one sequence into another by making them identical): i) substitution of one state with one of the others, ii) the insertion of one state or iii) the deletion of one state at a certain point in the sequence. Specific costs are attributed to each operation and their sum—computed through the Levensthein matrix for alignment (Levenshtein, 1966)—represents one pairwise distance measure. The sequences are considered more similar if fewer operations are needed to align them. In the current study, the insertion-deletion and substitution costs were set at 1 and 2 respectively.

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[12] Notice that AD-SILC does not allow identifying months spent in some kind of education along the seven years after the first employment episode occurred, and therefore these episodes will be labelled as in joblessness. However, the definition of the first employment spell based on a threshold of a 12 weeks-length after the highest level of education was attained serves the purpose of avoiding considering as first 'significant' spell those cases like summer jobs during education.

[13] All sequence analysis steps were performed by using the R packages TraMineR and TraMineRextras (Gabadinho, Ritschard, Mueller, & Studer, 2011), and Weighted-Cluster (Studer, 2013), version R.3.5.1. (R Core Team, 2018).

This cost specification emphasizes similarity both in terms of duration and sequencing of the events occurred across the sequences (Macindoe & Abbott, 2004; Studer & Ritschard, 2016).[14]

The cluster analysis partitions the initial set of sequences[15] into subgroups characterized by the highest possible within-group homogeneity and between-group heterogeneity by using the partitioning-around-medoids (PAM) method (Studer, 2013). Medoids are representative sequences that have the least dissimilarity to the other sequences in the cluster they belong to. The corresponding algorithm (Kaufman & Rousseeuw, 2005) pursues a global optimization.[16] The average width silhouette cut-off criterion (AWS) indicated that the 8-cluster solution was the best for describing the structure of the data.

5.3. The complexity index to measure early-career instability

Had I chosen to use a simple count measure of the number of employment states or transitions between states experienced throughout the sequences representing early-

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[14] Although the OM distance measure emphasises exactly the dimensions relevant to the present study and it is therefore the most appropriate to use, I tested different distance measures in combination with different cluster solutions as a robustness check. Specifically for the 8-cluster solution, I use the Dynamic Hamming Distance (ASW=0.39), the Hamming Distance (ASW=0.39), OM of spell sequences (ASW= 0.11), OM with *indel*=0.5 and substitution costs=2 (ASW=0.39). For those with an ASW=0.39, the results in terms of cluster configuration and estimates from the multinomial logistic regression (available upon request) are highly consistent with those presented in the next section. However, the OM solution performs better, with an ASW=0.43.

[15] Additionally, I performed separate cluster analyses by gender. An 8-clusters solution was identified as optimal according to the ASW criterion for women and the third best for men. The visual inspection of the eight clusters by gender reveals that the patterns are highly consistent with respect to the dynamics of the trajectories assigned to each cluster (results not shown available upon request).

[16] In contrast, hierarchical methods (such as Ward) undertake a local optimization that could not be optimal on a global level.

career trajectories, this would not have incorporated information on the uncertainty of state occurrences and their length. Therefore, a composite measure that proxies instability was adopted. The complexity index (Gabadinho, Ritschard, Mueller, & Studer, 2011) is calculated as the geometric mean of the normalized number of transitions between states and the normalized longitudinal entropy (i.e. the disorder or the uncertainty) of the sequence. Entropy is maximal when the unpredictability of a given outcome is maximal: for example, entropy is equal to 1 if the occurrence of a given state within the sequence cannot be predicted. The complexity index (C) takes into consideration the occurrence of the possible states, the length of time spent in each state, and the number of transitions between states within the sequence (x) and can be formally expressed as:

$$0 \leq C(x) = \sqrt{\frac{q(x)}{q_{max}} * \frac{h(x)}{x_{max}}} \leq 1$$

where $q(x)$ represents the number of transitions in the sequence and $h(x)$ is the longitudinal entropy of a sequence. Both $q(x)$ and $h(x)$ are divided by the respective maxima, q_{max} and x_{max}. The complexity index is therefore the mean of the two components normalized. The minimum value of C=0 refers to sequences composed of one single state and an entropy equal to 0. The maximum value of C=1 denotes sequences in which all possible states appear in the sequence (x) and each state lasts for an equal duration. The complexity index was computed for each cluster by gender and education to identify within-group discrepancies in early-career instability.

5.4. Multinomial logistic regression for cluster membership

For the third analytical step, two multinomial logistic regression models for the likelihood of experiencing the different early-career pathways were estimated. The main independent variables for the first model are gender and education (lower secondary, upper secondary, or tertiary). The second model includes an interaction between gender and education. The results are presented as average marginal effects (AME) and predicted probabilities (Long & Freese, 2014). All models include controls for potential confounders. First, given the striking differences by geographical areas in terms of labour market structure, the model includes controls for macro-area of birth (North, Centre, South and islands, or foreign country). Second, because different people experience their first employment spell at different ages, I included age at the first episode as a control (15–24, 25–29, or 30–34). Because the delay in obtaining the highest level of education attained is a human capital signal that might negatively affect labour market access, a control for the length of delay was also added: no delay, one year, or two or more years. Finally, I included a control for the year when the first episode occurred (1998, 1999, 2000, or 2001).

(Table 2 here)

6. Results

6.1. Early-career pathways: the heterogeneity of youth experience in the labour market

Figure 1 displays the eight types of early careers. In each graph, the x-axis shows the months after entering the labour market and the y-axis displays 50 sequences representative of those allocated to the cluster. The representative sequences in the plots are ordered according to the complexity of the trajectories. This graphical representation avoids over-plotting individual sequences and allows for a more rigorous visual inspection of the clusters.[17] In line with the exploratory *hypothesis 1*, the clusters display different degrees of stability over time. In some cases, one state is prevalent throughout most trajectories in the cluster, with short spell spent in other employment arrangements that do not negate the fact that most individuals in the cluster experienced overall employment stability. Other clusters display sequences that are (almost) all characterized by one specific state but interrupted by long spells in other states. Finally, some clusters show long-term transitions towards stability in one state: in these cases, an initial phase characterized by one or more states is followed by the convergence of the great majority of the trajectories into one prevalent state. This variability in the prevalence of specific states but also in the longitudinal dynamics of

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[17] The relative frequency sequence plots are produced using the *seqplot.rf* R function (Fasang and Liao 2014). First, the sequences in each cluster are ordered according to their complexity. Then, the sorted sets of sequences are partitioned into 50 frequency groups. For each frequency group, the medoid sequence is selected as representative on the basis of the dissimilarity matrix computed as input for the cluster analysis. The selected representatives are plotted as sequence index plots. The dissimilarities to the medoids within each frequency group and the goodness of fit are displayed in Figure A1 in the Appendix.

trajectories underscores the importance of considering pathways rather than single transitions between states when identifying a typology of early careers.

(Figure 1 here)

Stable early-careers. Almost 12% of the sample was allocated to the first cluster, '1.Stable self-employment': these individuals spent on average 67.6 months out of 84 as self-employed. Similarly, those in the smaller cluster '2.Stable professionals' (3.4%) spent 67.7 months on average working as professionals. Individuals in cluster '3.Stable public sector' spent 68.8 months as employees in the public sector. These three clusters have the lowest complexity values (0.147, 0.140, and 0.137 respectively), partially due to the smaller number of transitions and the lower number of alternative states appearing throughout the sequences. However, the stability of this pathway has to be considered in light of the limited protection offered for several specific occupations contained in these umbrella categories. For example, self-employed cannot access unemployment or sickness benefits and maternity leave is limited compared to employees, and continuous employment in the public sector may result from the accumulation over time of temporary contracts—on a rise in the healthcare, education, and welfare systems.

Discontinuous stability. Workers in the fourth cluster, '4.Discontinuous part-time' (5% of the sample), spent 58 months on average in permanent part-time employment. However, the great majority of individuals in this group experienced long spells in alternative employment arrangements, especially at the beginning or at the end of the observational window (complexity=0.176). The fifth cluster, '5.Discontinuous dependent self-employment', includes those who worked mainly on civil or

commercial contracts, but who are integrated into the firm for which they work even though they are formally outsourced providers. As mentioned above, these workers are entitled to reduced social security protection. Individuals in this cluster spent 53 months on average in dependent self-employment, but the trajectories were interrupted by long spells in other states (complexity=0.207).

Long-term transitions. One of the fortunate outcomes of adopting the sequence analysis framework is the identification of pathways characterized by long-term transitions. Had I narrowed the observational window to the transition to the first job, the analysis would have overlooked the fact that transitions can occur over several months or years and are usually less well-defined than studies of a single event would suggest (Shanahan, 2000). The sixth cluster, '6.Bridge apprenticeship-permanent full-time' (16.6% of the sample), exhibits a long transition from a temporary to a stable employment arrangement. Individuals belonging to this cluster were apprentices for about half of the observational window; then, the great majority moved into an in open-ended full-time job in the private sector. However, this path was not without obstacles for some of the individuals in the group, who experienced transitions between several different states after finishing their apprenticeships. This impacts this group's complexity value, which is one of the highest (0.239).

The seventh cluster, '7.Stepping stone to permanent full-time', includes the biggest portion of the initial sample (almost 30%). The majority of young workers in this cluster spent 59.9 months on average in permanent, full-time employment. However, a large proportion of them entered the labour market on temporary, full-time contracts of around 1 year; these served as stepping stones to a permanent contract. A small number of transitions between fewer states is reflected in a relatively low average complexity value (0.164).

While the long-term transitions identified in the previous two clusters are transitions from less to more advantageous employment arrangements, the eighth cluster, '8.Progressive detachment' (19.6% of the sample), includes trajectories composed of frequent transitions between many different states at the beginning of the observational window followed by longer (and sometimes persistent) joblessness. The high initial instability is reflected in a relatively high complexity value (0.289).

6.2. Clusters composition and early-career complexity

Table 3 reports cluster composition by gender and educational level. These unconditional distributions show that women are more likely than men to enter two particular clusters—'4.Discontinuous part-time' (8.4% *versus* 2.3% respectively) and '3.Stable public sector' (11.4% *versus* 7.1%). Men are more likely than women to belong to the seventh cluster '7.Stepping-stone to permanent full-time' (35.7% *versus* 26.4% for women). Interestingly, men and women have no significantly different likelihood of belonging to the eight cluster '8.Progressive detachment'.

Table 3 additionally hints at differences by education in the likelihood of experiencing different early-career pathways. Compared to tertiary educated individuals, those with a lower-and upper-secondary education have higher probabilities of belonging to three clusters: '1.Stable self-employment', '6.Bridge apprenticeship-permanent full-time', and '8.Progressive detachment'. Those with a university education are more likely to experience the pathways '7.Stepping-stone to permanent full-time', '3.Stable public sector', and '5.Discontinuous dependent self-employment'.

(Table 3 here)

The box plots in Figure 2 show the distribution and the dispersion of the complexity index for each cluster by gender and education. As mentioned above, the complexity values proxy the degree of instability of individual sequences representing early-career trajectories. The average complexity values by cluster hide substantial differences according to gender and education.[18] Tertiary education is associated with lower average early-career complexity for both men and women, with the exception of the cluster '4.Discontinuous part-time' for women. In other words, even when experiencing similar early-careers in terms of the prevalent type of employment, holding a tertiary degree seems to act as 'protection' against frequent transitions between various employment arrangements. Interestingly, in the case of the pathway characterized by high number of transitions and joblessness—i.e. '8.Progressive detachment'—the median complexity value is very similar across educational groups for both men and women, but the dispersion is smaller for tertiary educated individuals. The dispersion around the mean for those with lower- and upper-secondary educated individuals is disproportionately unbalanced towards higher complexity values. Overall, these findings speak in favour of *hypothesis 4*: young workers who entered the labour market with lower human capital seem to have fewer opportunities for stabilization compared to those with higher education even when

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[18] The cluster analysis serves the purpose of simplifying the information from a pool of sequences to uncover the main patterns. It might well be that the same pattern emerges when performing the cluster analysis on two subgroups (say by gender), but the sequences assigned to two similar clusters display different degree of complexity. This does not necessarily imply the existence of *different* patterns for men and women. In fact, differences in complexity within the same cluster extracted from a pooled sample may be driven, for example, by the number of transitions between different states experienced by men and women. The striking similarity in the pattern identified when performing the cluster analysis on separate samples by gender (see footnote 15) supports this interpretation.

experiencing similar pathways in terms of prevalence of a specific state or longitudinal dynamic in general.

(Figure 2 here)

6.3. The social stratification of early-career trajectories

Figure 3 displays the average marginal effects of gender and education for the probability of experiencing the eight early-career clusters. These differentials can be interpreted gaps in the probability of experiencing more precarious early careers and therefore do not back the idea of individualization of risks (*hypothesis 2*). For women (panel *a*) the gap takes the form of a lower probability of benefit from the stepping-stone effect of temporary jobs to permanent full-time positions and a lower probability of experiencing long-term stability in self-employment and as professionals. The gap is further signified by women's higher likelihood of progressive detachment. Women are more likely to follow pathways characterized by long-lasting episodes in the public sector and into part-time jobs. Ideally, it would be especially important to know whether these outcomes in terms of early-career configuration represent a voluntary investment on part-time jobs because women (more than men) have already or anticipate future childcare responsibilities; or rather these early-careers are the only available to them due to mechanisms associated with discrimination. Interestingly, no woman in the sample had a child before entering the labour market and only 6% of them had a child during the 7-year-long observational window.[19] These evidences and

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[19] Including variables measured *along* the sequences (that is not antecedent) as controls in the regression analysis for estimating the probability of being assigned to a specific cluster is not methodologically sound. Nevertheless, I performed this (weak) robustness check by adding a control for the interaction between gender and having

the size of the marginal effects presented in panel *a* in Figure 3 give support to *hypothesis 3* and suggest that, while men are not fully shielded from the least desirable pathways in terms of protection and/or stability, women do not have equal access to the most desirable ones even after controlling for potential confounders.

The clear educational gradient emerging from results displayed in panel *b* gives further (and more robust) support to *hypothesis 4.* In fact, the likelihood of achieving stability as a professional and in the public sector as well as of permanent employment after a spell in temporary employment increases as education does. Workers with at least lower secondary education are more likely to be long-term self-employed and progressively detached compared both to upper secondary and tertiary educated (around -10% and -20% probability on average): both pathways are associated with low social protection, and the second might hide employment in the informal sector, which constitutes a more 'immediate' channel into the labour market for low-skilled workers. The only gap that favours lower educated individuals is the higher likelihood of going from an apprenticeship to permanent full-time arrangements. Interestingly, the probability of experiencing the pathway of discontinuous dependent self-employment increases with education: similarly to self-employment, jobs regulated with this type of contract do not give access to unemployment and sickness benefits. Additionally, pension contributions are very low, with severe implications for future retirement benefits given the Italian contribution-based system. However, the occupations were these contracts are available are various, ranging from professionals and technicians to elementary ones (ILO, 2017). Therefore, among those in discontinuous dependent self-employment, highly educated might be located in more

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had a child during the 7-years observational window. The results for differences by gender and education and their interaction correspond to those presented here.

prestigious occupations and—as suggested by empirical evidence on other European countries—possibly, opted for such arrangements more consciously compared to lower educated exactly because of the higher quality in terms of prestige (De Jong et al., 2009).

(Figure 3 here)

Each plot in Figure 4 shows the linear probabilities of being sorted in the early-career pathways by gender and education. The *hypothesis 5* of an additional disadvantage for women with lower human capital in the probability of experiencing less desirable pathways in terms of stability and social protection is supported by several findings. First, a much stronger negative educational gradient exists among women compare to men for the likelihood of being in '1.Stable self-employment' and. Second, the gradient is still stronger for women but positive for '3.Stable public sector' and '5.Discontinuous dependent self-employment'. As mentioned above, these results have to be interpreted in light of the variety of occupations in the public sectors and covered by dependent self-employment, as well as of the associated lack of social protection that might not be compensated by the prestige of the occupation. Finally, women with at most lower secondary education are less likely of benefiting from the stepping-stone effect of temporary to permanent full-time jobs, and also more likely to be progressively detached compare to both more educated women and men with the same educational level.

(Figure 4 here)

7. Discussion and conclusions

This paper contributes to the debate on inequalities in early careers against the backdrop of labour market deregulation. Instead of looking at isolated transitions between employment states and their timing, a longitudinal perspective is adopted to shed light on differences in the dynamics of young worker's early-career trajectories. The analyses focus on a cohort of Italian young workers whose early-careers unfold in a highly deregulated labour market to. Applying sequence analyses to a unique data source that allowed for distinguishing between several types of non-standard employment, eight early-career pathways characterized by different degrees of employment stability and protection were identified. The identification of patterns that clearly distinguish the trade-off between stability and protection that concerns continuity in specific employment arrangements or the high number of transitions between states inform our knowledge of the generating process of precariousness in early careers.

This within-country heterogeneity in patterns is generally hidden in cross-country studies, where Italy is generally levelled off to the 'failure' school-to-work transition ideal-type. Similarly to previous research focusing on one country (Acosta-Ballesteros et al., 2017; Anders & Dorsett, 2017; Biemann et al., 2012; Brzinsky-Fay & Solga, 2016; McVicar & Anyadike-Danes, 2002; Middeldorp et al., 2019), the focus on one specific context and cohort allowed for the identification of social stratification in early careers. In fact, consistent with the persistence of inequality hypothesis, the findings show that women have a higher probability than men of experiencing pathways characterized by employment discontinuity, weak employment protection, and less generous or absent social security. Even the traditionally guaranteed

employment in the public sector might hide high levels of insecurity, as the public sector was affected by massive deregulation (mainly through out-sourcing). These gaps go beyond the gender gap in the school-to-work transition found by most research focusing on first jobs, as they pertain to the medium-term trends of women's labour market integration. In a context with weak support for formal childcare, women's early careers seem to be strongly shaped by their gendered master status even before family formation occurs.

Workers with lower secondary education are more likely to experience pathways associated with low social protection or characterized by multiple transitions between employment arrangements as well as numerous spells in joblessness. Moreover, even when they experience similar pathways, workers with tertiary education have less volatile and complex early careers. Interestingly, workers with at most lower secondary education are more likely than the upper-secondary-educated group to transitioning from apprenticeships to permanent full-time contracts: this hints at possibly positive outcomes of this temporary non-standard arrangement especially for a particularly vulnerable group of workers, who represent 25% of the entry cohorts analysed here. This pattern resembles the prevalent school-to-work transition process in countries with a strong vocationally oriented secondary education systems (see e.g., Brzinsky-Fay, 2007; Middeldorp et al., 2019).

Finally, similarly to gender 'gaps' (like wage) that have been found to be heterogeneous across educational levels (Mussida & Picchio, 2014), here a specific disadvantage for lower educated women when looking at early careers as a whole is identified, in that they have the highest probability of experiencing more precarious pathways. These inequalities might not be apparent when considering point-in-time indicators. Therefore, the findings presented here corroborate previous literature

suggesting that focusing on the average women's advantages in educational attainment and achievement might lead to disregard disadvantages emerging in the medium and long run among the most vulnerable of them when they enter the labour market (Abrassart, 2015; Blossfeld et al., 2015; Struffolino & Borgna, 2018). As a matter of fact, lower educated women's careers might not be 'boundary-less' but rather much more bounded by gender- and education-sensitive opportunity structure.

This paper has some limitations, which hint at possible extensions of the present work. First, because changes between different jobs in the same type of employment were not considered, instability might have been actually underestimated. This means that the results presented here are—if anything—conservative. This operationalization choice was more beneficial for identifying and describing patterns of continuity/discontinuity within the pathways, which drove more or less precariousness in labour market participation, than stressing contract duration. Second, future research should look closely at the role played by family formation dynamics play a role in 'bounding' women's employment trajectories for women later on in the life course. Existing literature shows extensive wage and participation gaps after childbirth in virtually all Western rich democracies (Budig & England, 2001; Misra, Budig, & Moller, 2007), but so far we lack evidence on how more or less stable and protected employment trajectories before the transitions to parenthood are associated to later-career 'process outcomes'. In this respect, it will be of utmost importance considering if and to what extent different work-family policy regimes succeed in reducing the disadvantage experienced in early-careers by vulnerable groups of workers.

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Table and Figures

Table 1 States defining the individual sequences representing early careers in the labour market.

State
Permanent full-time contract in the private sector
Permanent part-time contract in the private sector
Temporary full-time contract in the private sector
Temporary part-time contract in the private sector
Employment in the public sector
Professional
Dependent self-employment
Self-employment
Apprenticeship
Joblessness

Table 2 Distribution of the independent and control variables

	%
Gender	
Women	45.5
Men	54.5
Area of birth	
North	33.1
Centre	21.8
South-Islands	45.1
Education	
At most lower secondary	26.8
Upper secondary	53.0
Tertiary	20.2
Delay in education	
No delay	76.8
1 year	10.0
2 or more years	13.3
Age at the entry	
15–19	9.5
20–23	47.5
24–28	28.6
29–34	14.5
Year when the first episode occurred	
1998	24
1999	25.4
2000	26
2001	24.6
N.	*2,616*

 Source: AD-SILC data (weighted).

Table 3 Composition of the clusters by gender and education.

	Gender		Education			
Cluster	Women	Men	Lower Sec.	Upper Sec.	Tertiary	Tot./N.
1 Stable self-employment	10.4	14.0	17.9	12.7	4.3	*12.4*
2 Stable professional	2.3	3.4	0.3	2.0	9.0	*2.9*
3 Stable public sector	11.4	7.1	2.2	8.7	19.1	*9.1*
4 Discontinuous part-time	8.4	2.3	4.8	5.6	4.0	*5.1*
5 Discontinuous dependent self-employment	5.9	4.0	1.0	4.0	12.4	*4.9*
6 Bridge apprenticeship-permanent full-time	14.0	14.6	21.2	16.1	0.6	*14.3*
7 Stepping-stone to permanent full-time	26.4	35.7	21.8	32.2	42.6	*31.5*
8 Progressive detachment	21.2	18.9	31.0	18.8	8.2	*19.9*
N.	*1252.0*	*1364.0*	*629.0*	*1530.0*	*457.0*	*2,616*

Source: AD-SILC data (weighted).

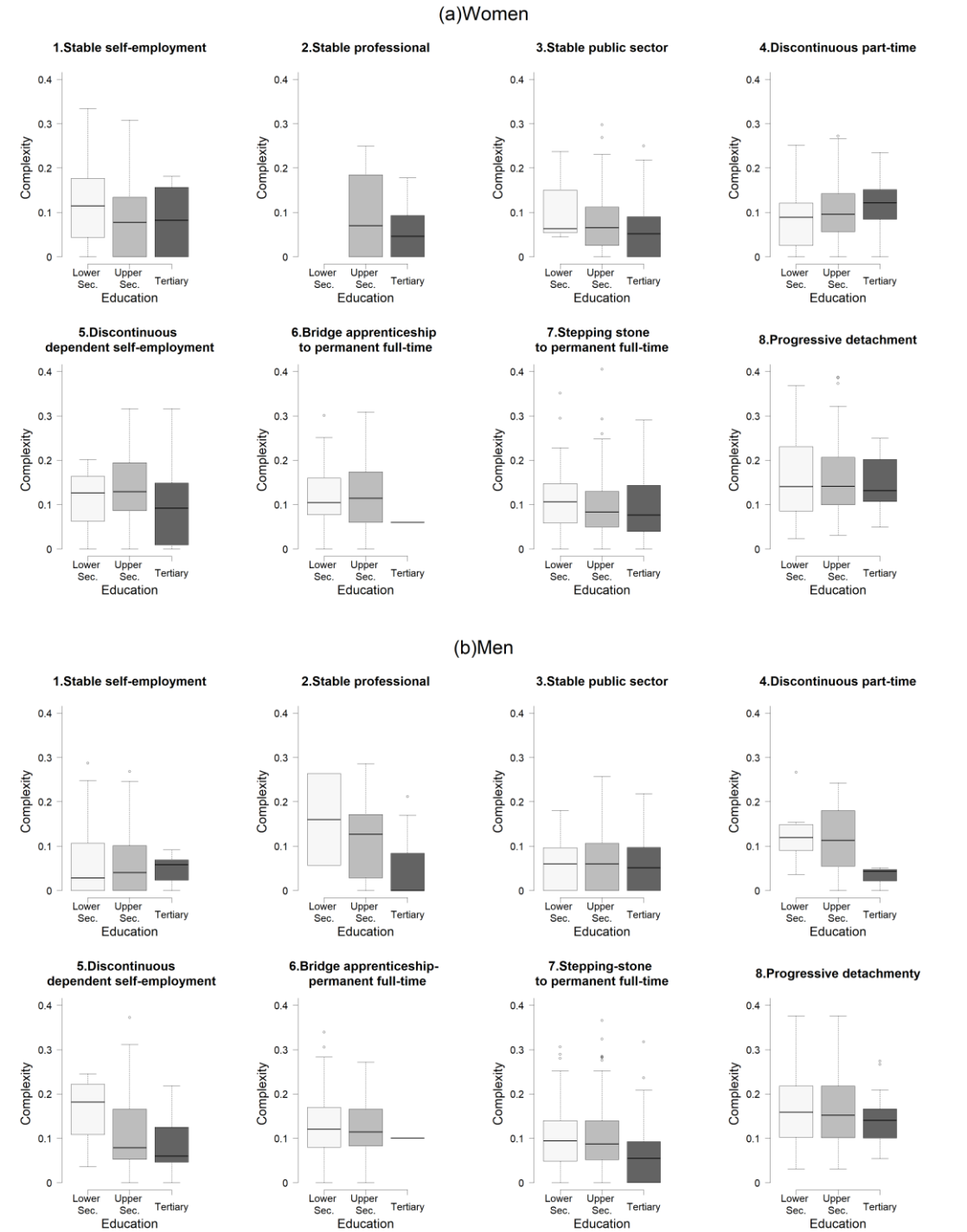**Figure 1 Relative frequency plots for the 8 clusters of early-career pathways**
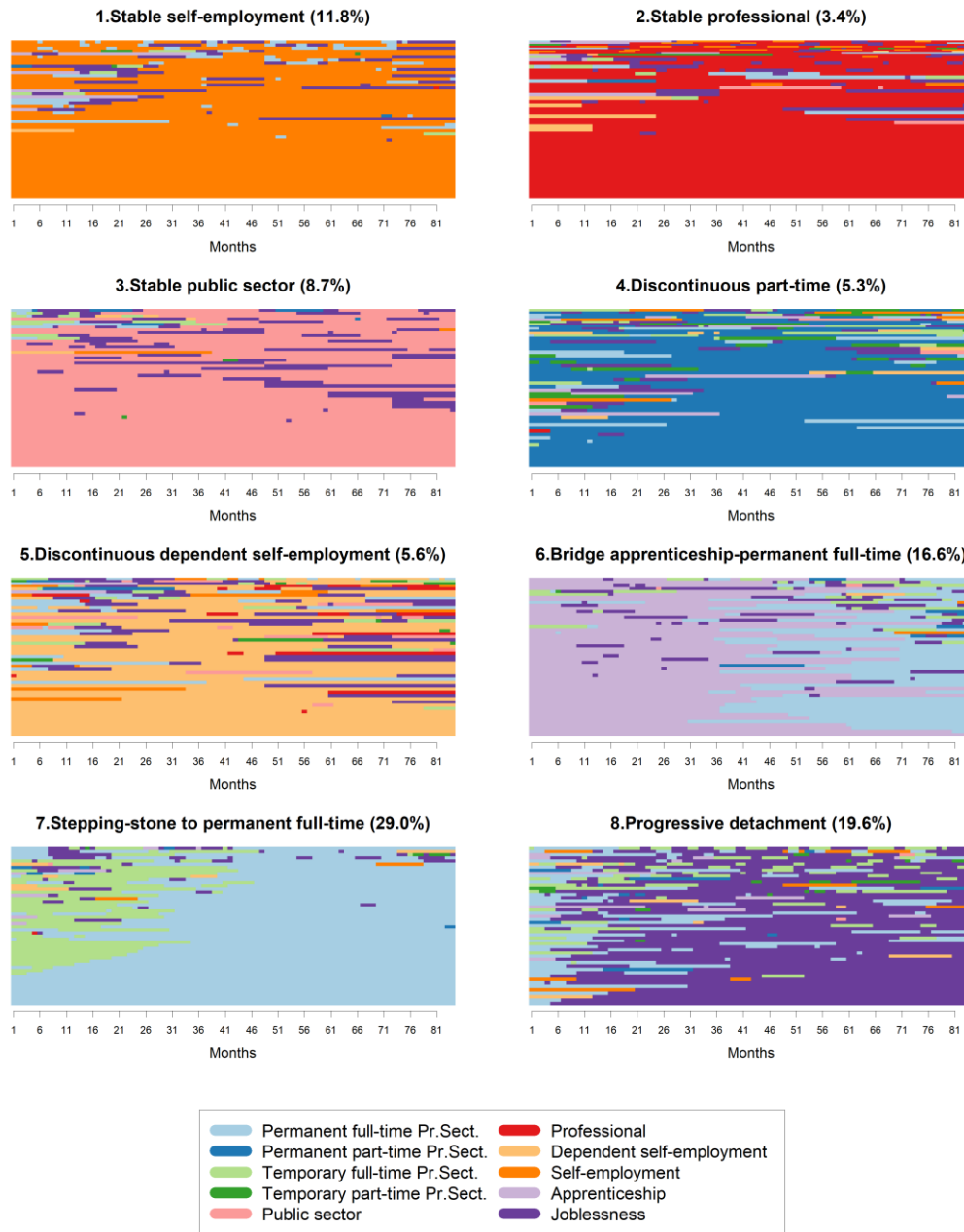
Y-axis=50 representative sequences for each sub-group (Fasang & Liao, 2014), X-axis=months from the entry into the labour market. Sequences are sorted by complexity index values. Source: AD-SILC data.

Figure 2 Distribution of the complexity index by gender and education across clusters

Source: AD-SILC data.

Figure 3 Average marginal effects of gender and education on the probability of experiencing each early-career pathway.
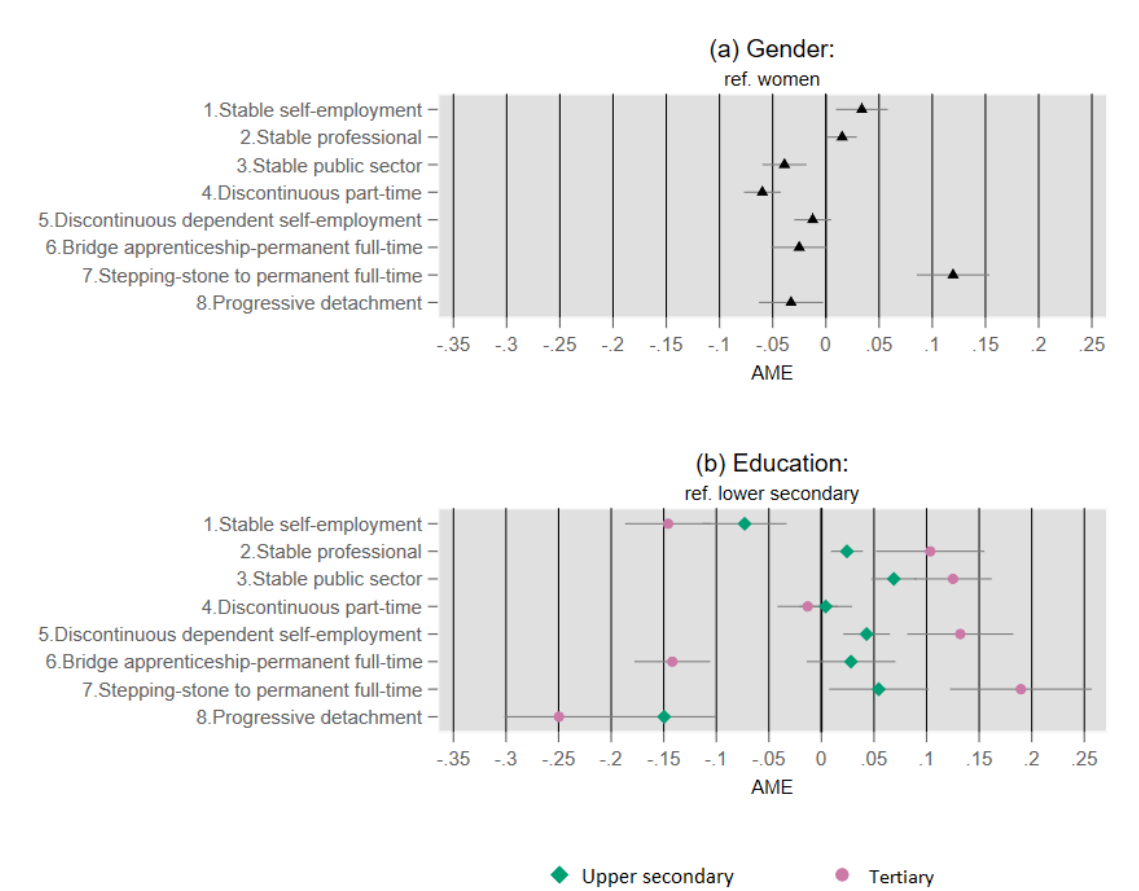
Note: The multinomial logistic regression model additionally controls for gender, education, geographical area, years of delay in obtaining the highest educational qualification, age at the first episode of employment, year when the first episode occurred. 95% confidence intervals. Source: AD-SILC data.

Figure 4 Probability of experiencing each ideal-typical early career by gender and education.
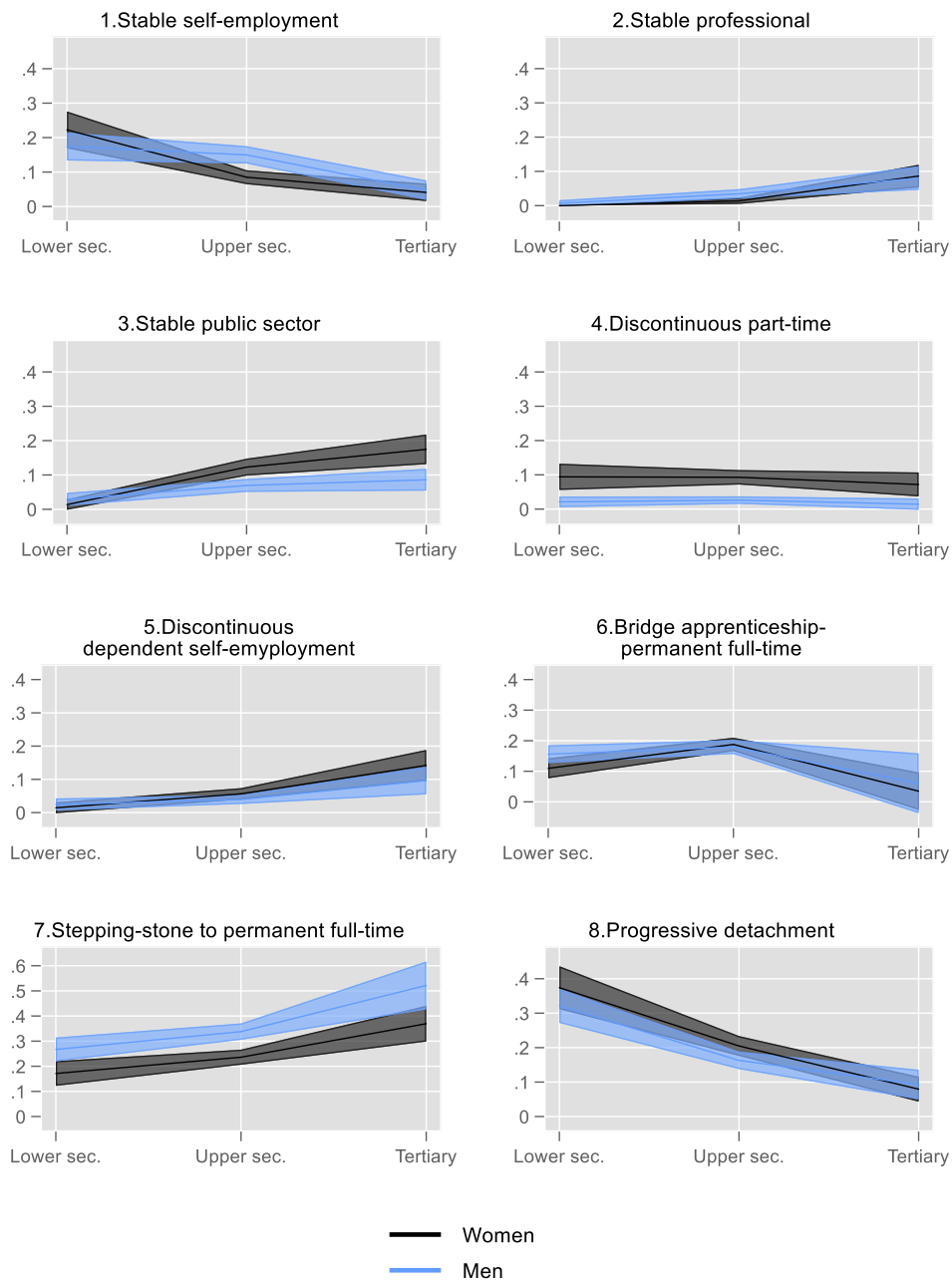
Note: The multinomial logistic regression model additionally controls for geographical area, years of delay in obtaining the highest educational qualification, age at the first episode of employment, year when the first episode occurred. 95% confidence intervals. Source: AD-SILC data.

Appendix

Table A1 Time spent in each state, number of transitions between states, and complexity by cluster.

| State	Cluster							
	1	2	3	4	5	6	7	8
	Stable self-employment	Stable professional	Stable public sector	Discontinuous part-time	Discontinuous dependent self-empl.	Bridge apprenticeship-permanent full-time	Stepping-stone to permanent full-time	Progressive detachment
Open-ended Full-Time Pr.Sect	4.2	3.0	1.1	5.2	5.7	20.5	60.1	11.4
s.d.	8.1	7.7	3.7	9.5	10.6	16.8	18.8	13.7
Open-ended Part-Time Pr.Sect	0.7	0.3	0.3	57.2	2.1	1.6	1.9	3.4
s.d.	3.6	1.9	2.0	19.0	6.1	5.7	5.9	7.6
Temporary Full-Time Pr.Sect.	1.7	1.3	1.5	3.0	2.9	4.3	12.1	7.0
s.d.	5.6	5.3	4.6	8.5	7.1	9.4	15.2	11.7
Temporary Part-Time Pr.Sect.	0.3	0.6	0.5	4.9	1.2	0.9	0.9	2.3
s.d.	1.9	3.7	3.6	9.9	3.6	4.2	3.9	6.6
Public Sector	0.6	1.2	68.4	1.0	3.2	0.2	0.5	2.0
s.d.	4.0	4.9	15.4	4.5	8.6	1.8	3.7	6.8
Professional	0.5	67.7	1.1	0.2	1.9	0.1	0.4	0.7
s.d.	3.2	16.6	5.9	1.3	6.7	0.7	3.0	3.4
Dependent self-employment	0.9	2.1	1.6	1.8	52.6	0.9	1.1	2.6
s.d.	3.8	6.4	5.4	5.2	20.1	4.0	4.2	6.3
Self-employment	67.6	2.0	0.3	1.3	2.8	1.6	1.0	3.8
s.d.	16.9	7.0	2.2	5.1	7.6	5.6	4.6	9.0
Apprenticeship	1.9	1.0	0.4	3.4	1.9	46.6	1.5	3.3
s.d.	6.0	4.1	3.2	8.6	6.6	16.3	4.6	7.7
Joblessness	5.7	4.7	8.9	6.1	9.7	7.4	4.5	47.5
s.d.	9.2	8.1	10.8	8.7	11.6	9.1	7.6	16.5
Average number of transitions	2.9	2.7	2.4	3.1	3.4	3.8	2.9	5.8
Complexity	0.147	0.140	0.137	0.176	0.207	0.239	0.164	0.289
CI. Complexity	(0.130-0.164)	(0.109-0.169)	(0.121-0.151)	(0.158-0.196)	(0.187-0.232)	(0.229-0.248)	(0.155-0.173)	(0.275-0.303)
% sample assigned	11.8%	3.4%	8.7%	5.3%	5.6%	16.6%	29%	19.6%

Source: AD-SILC data.

Table A2 Multinomial logistic regression model for the relative probability of belonging to the clusters

	Cluster						
	1	2	3	4	5	6	8
	Stable self-employment	Stable professional	Stable public sector	Discontinuous part-time	Discontinuous dependent self-empl.	Bridge apprenticeship-permanent full-time	Progressive detachment
	OR	OR	OR	OR	OR	OR	OR
Women (ref.)							
Men	-0.140	0.238	-0.723***	-1.652***	-0.596**	-0.563***	-0.616***
	(0.191)	(0.290)	(0.211)	(0.289)	(0.258)	(0.178)	(0.163)
North (ref.)							
Center	-0.413*	4.245***	1.213**	0.0508	1.697**	0.0414	-0.769***
	(0.235)	(1.052)	(0.516)	(0.355)	(0.668)	(0.279)	(0.205)
South and Islands	-1.921***	4.947***	1.228**	-0.897*	2.187***	-2.744***	-1.978***
	(0.338)	(1.049)	(0.533)	(0.472)	(0.705)	(0.784)	(0.317)
Lower sec. (ref)							
Upper sec.	0.204	0.565	0.346	0.101	-0.570*	-0.134	0.731***
	(0.285)	(0.371)	(0.281)	(0.370)	(0.336)	(0.271)	(0.226)
Tertiary	0.459**	0.0731	0.368	-0.0902	-0.674**	-0.301	0.434**
	(0.214)	(0.360)	(0.228)	(0.269)	(0.288)	(0.186)	(0.185)
Late entry no (ref.)							
1 year	-0.437	0.0737	0.435	-0.500	0.283	-0.407	-0.109
	(0.333)	(0.434)	(0.290)	(0.538)	(0.400)	(0.373)	(0.301)
2 years or more	-0.171	-0.332	0.131	-0.690*	0.165	0.0840	0.341
	(0.272)	(0.448)	(0.302)	(0.410)	(0.392)	(0.385)	(0.222)
15–19 (ref.)							
20–24	-0.748	-4.573***	-0.392	-1.167*	-2.058**	-1.674***	-0.555
	(0.474)	(1.479)	(0.937)	(0.695)	(0.868)	(0.402)	(0.388)
25–29	-0.353	-3.450**	0.156	-0.773	-1.585*	-4.918***	-0.404
	(0.481)	(1.465)	(0.959)	(0.695)	(0.878)	(0.659)	(0.401)
30–34	0.141	-2.734*	1.143	-0.273	-1.513	-24.42***	-0.341
	(0.518)	(1.472)	(0.937)	(0.770)	(0.971)	(0.405)	(0.435)
1998 (ref.)							
1999	-0.406	0.231	-0.151	0.912***	-0.345	0.173	-0.0238
	(0.254)	(0.441)	(0.274)	(0.352)	(0.373)	(0.248)	(0.223)
2000	-0.315	0.0403	0.164	0.747**	-0.180	-0.0123	0.212
	(0.253)	(0.463)	(0.289)	(0.377)	(0.367)	(0.246)	(0.220)
2001	-0.242	0.448	0.154	0.509	0.302	0.372	0.335
	(0.268)	(0.418)	(0.310)	(0.384)	(0.362)	(0.263)	(0.231)
Constant	0.137	-3.534***	-2.457***	-0.597	-1.216*	1.667***	0.525
	(0.462)	(1.241)	(0.844)	(0.658)	(0.653)	(0.352)	(0.373)
Observations	2,616	2,616	2,616	2,616	2,616	2,616	2,616

Note: Reference category of the dependent variable: cluster '7. Stepping-stone to permanent full-time'. Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. Source: AD-SILC data.

Figure A1: Dissimilarities to the medoid within each frequency group as a box-and-whisker plot by cluster.
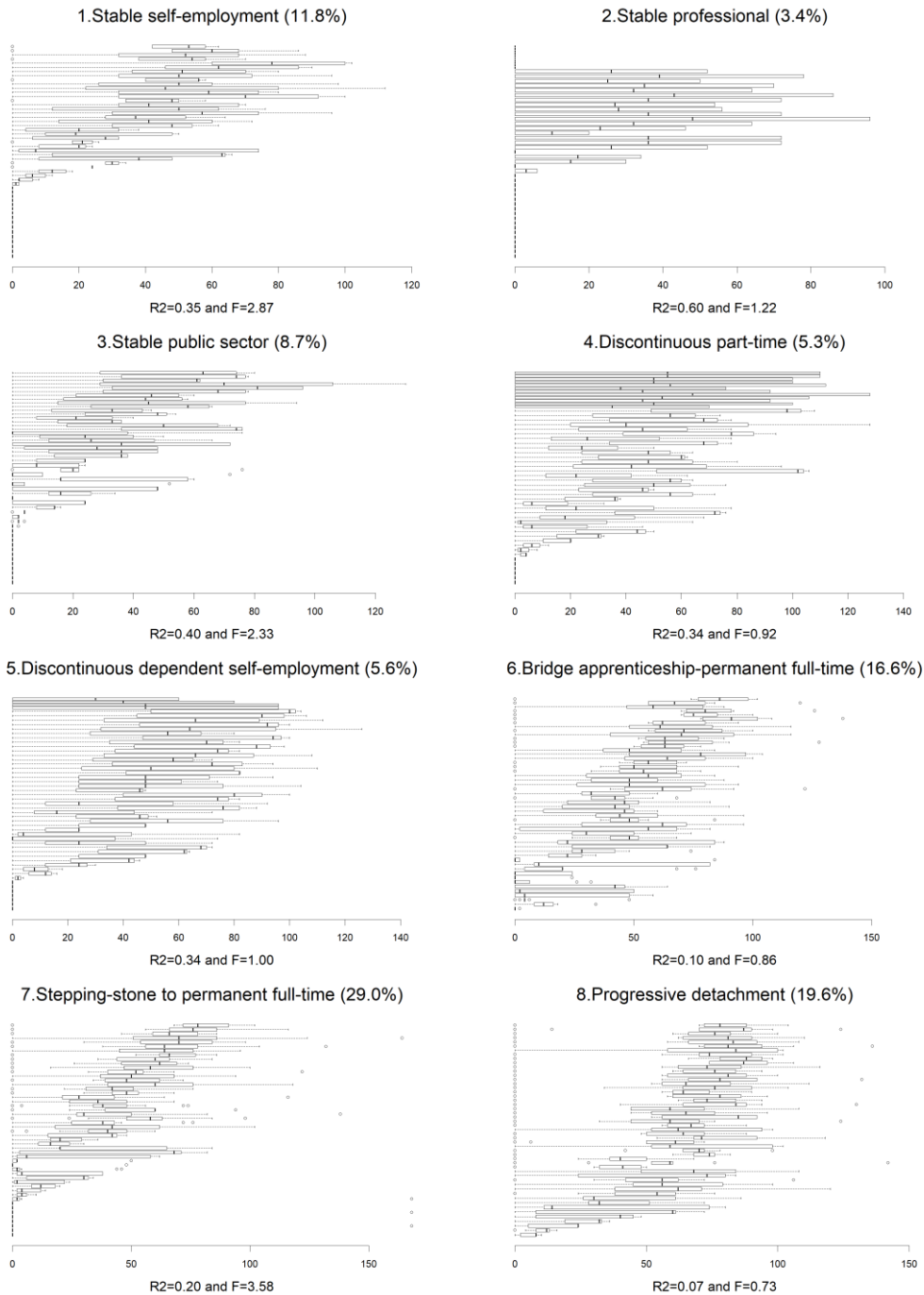
Y-axis= box-and-whisker plot for the dissimilarities to the medoid within each frequency group; X-axis=distance from the medoid selected as the most suitable representative sequence of each frequency group. R^2 and F statistics for the goodness of fit are displayed below each plot (Fasang and Liao, 2014). Source: AD-SILC data.