The Impact of Critical Events on Work Trajectories

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Résumé

Le sujet central de ma thèse est l'étude des conséquences des « événements critiques », en particulier le chômage et la naissance d'un enfant, sur les carrières individuelles. Mon travail est composé de trois études empiriques. Le premier chapitre empirique (écrit avec le Prof. Felix Bühlmann - Université de Lausanne) décrit les conséquences d'une période du chômage. Plus précisément, nous décrivons trois effets du chômage : chômage de longue période, passage à un travail moins prestigieux et instabilité des carrières. Nos résultats soulignent que le chômage a des effets différents sur différents groupes de la population, à la fois pour l'intensité et le type de l'effet. Les groupes plus vulnérables sont les femmes (passage à un travail moins prestigieux), les travailleuses et travailleurs moins qualifiés (instabilité des carrières), et les travailleuses et travailleurs âgés, étrangers et, étonnamment, fortement éduqués (chômage de longue période). Le deuxième chapitre empirique décrit les différences au sein des marchés du travail et des économies cantonales. Je réduis les différences régionales suisses à trois types : marchés du travail « marginaux », « à plusieurs centres » et « attractifs ». Les marchés du travail « marginaux » sont composés par une structure économique centrée sur le territoire avec une forte présence d'activités avec une basse valeur ajoutée et qui est peu attractive pour les travailleurs d'autres cantons et les frontaliers. Les marchés du travail « à plusieurs centres » sont des territoires mixtes, avec des villes fortement attractives pour les travailleurs d'autres régions, et des zones rurales moins attractives. Par rapport à d'autres régions suisses, ils ont des hauts taux de chômage. Les marchés du travail « centraux » ont des économies avec de fortes connexions internationales, une importante présence de sociétés multinationales et du secteur high-tech. Dans la partie finale de ce chapitre, mes résultats montrent que ces divisions territoriales ont une influence sur les parcours de vie individuels. Dans le troisième chapitre (écrit avec Ashley Pullmann - University of British Columbia), nous étudions les effets des réformes du congé maternité introduites en Suisse en 2005 et au Canada en 2001 sur les carrières des nouveaux parents. Nos résultats montrent que la réforme suisse a moins d'effet que la réforme canadienne. Les causes sont liées à un changement plus petit en ce qui concerne la longueur du congé maternité et à un contexte socio-économique relativement défavorable à une forte participation des mères dans le marché du travail. Ma thèse se conclue par une réflexion théorique (mais basée sur mes résultats empiriques) sur le type de théories de l'action utilisées dans les études sur les parcours de vie, sur les différents effets d'évènements critiques sur différents groupes sociodémographiques, et sur l'apport de l'analyse longitudinale aux modèles de causalité.

Abstract

The analysis of the consequences of a life-course "critical event", particularly a period of unemployment and a childbirth, on individual careers is the main subject of this thesis. Three empirical studies compose my work. The first empirical study (written with Felix Bühlmann – Université de Lausanne) describes the consequences of a period of unemployment. More precisely, we describe three unemployment effects: long-time unemployment, professional downgrading, and career instability. Our results stress that unemployment has an effect that varies among socio-demographic groups both in size and in the type. The most vulnerable groups are women (for professional downgrading), low-qualified workers (for career instability), and old, foreign, and, surprisingly, well-educated workers (for long-term unemployment). The second empirical study describes the cantonal differences in the Swiss labor market. In my analysis, I condense these differences in a typology that include three idealtipical labor markets: "marginal", "multicenter", and "attractive". Marginal labor markets have a local-based economy with a strong presence of low added-value activities. Consequently, they are poorly attractive for workers coming from other territories. Multicenter labor markets are mix territories, with cities that strongly attract workers coming from other territories and rural areas with a local labor force. Multicenter labor markets record high unemployment rates in comparison with other regions. Central labor markets have an economic structure with strong international connections, and record a large presence of multinational and high-tech companies. In the final part on this study, I show how the territorial differences described by this typology have an impact on individual life-courses. In the third chapter (written with Ashley Pullmann - University of British Columbia), we study how parents' careers varied after two similar maternity leaves reforms, the first occurred in Switzerland in 2005 and the second introduced in Canada in 2001. Our results show that the Canadian reform impacted parents' careers more that the Swiss one. The causes of this difference are traced back to a stronger change in the length of the maternity leave, and in a socioeconomic context that, in Switzerland, is relatively hostile to a strong presence of mothers in the labor market. In the conclusion, I present few empirically-informed theoretical considerations on (a) the model of human action that best suits life-course analyses, (b) how life-course critical events have different effects depending on individuals' sociodemographic characteristics, and (c) the contribution of longitudinal analysis to the definition of causal models.

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INTRODUCTION

Keys points of this thesis

Anyone who has ever been to a party knows that one of the first questions asked when meeting a new person is: "what do you do for a living"? In a large part of the cases, people do not start by speaking about their hobbies, their interests, or their spiritual life. They normally start describing their job and the particular tasks of which they are in charge. This simple social experiment stresses the importance of work for individual identities in present-day lives. In Europe, the connection between job positions and individual identities was slowly established during the past centuries. A slow process that starts in medieval guilds and passes through renaissance artisans corporations, up to the industrial revolutions, the bourgeois professions and the ideologies of the twentieth century which describe the individual, essentially, as a worker. Even if fading, the long wave of this process is still present today and work still links individual identities with social roles. Surely, people's job position does not define their identity as much as few decades ago, nevertheless ideologies that wish to separate the job dimension from individual identities and social roles are still to come. Nevertheless, some fissures in the monolithic relation between work and individual identity become visible. For example, the discussion around the "basic income", that is debated in economic research (e.g. Friedman 1962), and on the political agenda of many Western countries, including Switzerland where a referendum on the subject was organized in 2016. The idea of an income without labor is already present in our societies, but it is conceptualized as a collective insurance that replaces a missing work-connected salary that cannot be achieved due to external elements (e.g. sickness, maternity, invalidity). In addition, in many countries, this income is connected with previous job-related contributions (e.g. unemployment and maternity benefits). A basic income shifts the paradigm: labor would become completely disconnected from income. In sociology, the recent discussion on the connection between job positions, individual identities, and social roles, was often absorbed in the debate around post-modernity (Bauman 2005; Beck 1986; Giddens 1990). Researchers who followed the post-modernity paradigm imagined a society of individual identities detached from any collective reference. This approach has found very few empirical confirmations and the European "great recession", starting in 2008, showed how jobs are still a central part of peoples' self-representations (Krause 2010). Joblessness and precariousness deeply affect individuals' psychological stability (Clark, Georgellis, and Sanfey 2001) and have long-time consequences (Arulampalam 2000; Gangl 2006). Despite the European recession clearly revealed these links, we do not necessary need an epochal economic crisis to observe these effects. Individual dismissals have similar outcomes and stress the importance of job

positions in individual lives also in an economically stable context (Oesch and Lipps 2012). Given the centrality of the work dimension in individual lives, even when no major changes are happening in people's careers, job remains a major elements in their lives, and a change in this domain has consequences on other sectors of life (Pollock 2007). These changes vary among sociodemographic groups (Arulampalam 2000; Bigotta et al. 2011; Luijkx and Wolbers 2009; Mooi-Reci and Ganzeboom 2015) and, often, reveal the role of job careers in the definition of other life events (Girardin et al. 2016; Le Goff 2005; Widmer et al. 2012), the structure of the socio-economic relations (ILO 2016), the vulnerability of certain groups (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Walker and Marti 2010; Weber 2006), and the prejudices on them (Buchmann, Kriesi, and Sacchi 2003). Consequently, the study of individual work trajectories shed light on mechanisms that connect different life course domains. This is the main objective of this work. We[1] use the analysis of work trajectories as a privileged angle to observe the relation among different life-course domains and the socio-economic contexts. In particular, we analyze the changes around life-course turning points. A life course turning point is a short event that divides two clearly distinguishable periods of individual lives, and has consequences that reorient the life course process (Abbott 2009; Grossetti 2006). The use of turning points is heuristically interesting as the individuals are obliged to adapt to a fundamental change in their life course. This adaptation occurs in short periods of time and has quick repercussions on many aspects of individuals' lives (Abbott 2009). The longitudinal analysis of these adaptations reveals the links among different life-course domains (Pollock 2007) and between life-courses and the social context in which they are embedded (Abbott 2009; Furstenberg 2005). As a consequence, turning points can be used to illustrate the role of individual agency in life courses and its limits (Becker and Murphy 2000; Elder, Kirkpatrick Johnson, and Cronsoe 2004; Settersten and Gannon 2005).

In this thesis, we rely on the analysis of life course turning points to describe a set of results that goes from the analysis of work careers to the analysis of the interaction of individual life course domains in a changing socio-economic context.

[1] Parts of my thesis are written in collaboration with other researchers. For clarity's sake, and to maintain the uniformity of the text (especially in the introduction and in the conclusion), I use the pronoun "we" also in the parts where I am the single author. We can consider this a "pluralis modestiae".

Structure of this thesis

This thesis is organized in four main chapters and a conclusion. The first chapter is exclusively theoretical, while the others are three independent empirical studies (chapter 2, 3, and 4).

In the *first chapter*, we discuss the epistemological and theoretical bases on which the empirical studies rely. First, we introduce some principles of quantitative sociology. Too often these assumptions are left implicit. We think that it is important to acknowledge the limitations connected to quantitative sociology and the epistemological positions that are at the basis of this approach. This discussion is mean to avoid the tendency to "naturalize" the empirical results and take the output of the analytical instrument as a purely objective representation of social relations. This risk concerns both the researcher and the reader. An honest discussion is therefore necessary and has to precede any other argument on the theoretical approach and the methodological strategies. Following this discussion, we introduce the main theoretical approach we use in this thesis: the life course paradigm. This theoretical frame is structured around a number of principles that are largely accepted in the literature (see Elder 2004). Other elements, such as the heterogeneity of life courses, the limitations of individual agency or the models to describe the longitudinal relations in the life courses, are still under discussion among the experts. Both the theoretical principles already established and the ones still under discussion are discussed in their evolution and in their relation with the empirical studies presented in this thesis. In the last part of the first chapter, we discuss these issues and we take positions in the current scientific debate. We will take up again these aspects in the conclusion, where the theoretical reflections are compared with the empirical results.

In the *first analytical study (chapter 2)*[2], all the empirical analyses and the theoretical discussions are at the individual level. We start with a longitudinal description of the work careers of a representative sample of Swiss workers. In particular, we analyze the careers of people that experience a period of unemployment. In this first step of our analyses, we introduce two elements that are recurrent in the rest of thesis: the longitudinal dimension, and the presence of a life turning point as a reference for the analysis of individual careers. We define as "longitudinal dimension" the idea that individuals' careers are a sequence of statuses that cannot be reduced or synthetized by a single measure. This

[2] This chapter was written in collaboration with Professor Felix Bühlmann (University of Lausanne – NCCR LIVES).

value is one of the foundation of this work and, also, a major critique against part of the previous literature on unemployment (e.g. Gangl 2006). In this chapter, we also introduce the concept of a life turning point as a reference for the analysis of individual careers. We analyze the work trajectories starting around the transition to unemployment regardless of workers' age and calendar time. We acknowledge that it is not the same to be unemployed in young age or near the end of the working activity. Nevertheless, in our study, we consider the turning point as an experience that different social groups have in common. Socio-demographic and other contextual variables are studied as mediators of the consequences, but remain in the background. This observation leads us to the second step of our analysis in this chapter, i.e. the study of the relation between the effects of unemployment and individual characteristics. We start from the definition of the consequences related to the presence of a previous period of unemployment. There is a vast literature on this topic, that is called "unemployment scarring" (Arulampalam 2000; Arulampalam, Gregg, and Gregory 2001; Narendranathan and Elias 1993). The presence of a vast theoretical and empirical background produced a large set of theoretical and empirical instruments that we have combined to set up a multidimensional analysis of unemployment scarring. This multidimensional analysis shows how different people can experience consequences of unemployment that differ both in intensity and, especially, in the type. We identify three types of consequences of unemployment scarring: long-term unemployment, occupational downgrading, and career instability. Long-term unemployment is defined as repeated redundancies and long periods of joblessness. We describe occupational downgrading as a decline in terms of occupational category after a spell of unemployment. Finally, we define career instability as frequent changes in the work position. Even if partially related, these three types of scarring are different. They are not a simple difference of magnitude of the same phenomenon, but three different types of scarring.

We close this chapter with a discussion of the conception of unemployment that arises from our analyses. Unemployment is often described as an interruption of a work career composed of related job positions. As opposed to this, we stress that under the label "unemployment" we subsume similar but differentiated experiences that are integrated in the work career (e.g. young workers looking for their first job, people made redundant, or people that are on unemployment after a plant closure). The type of unemployment and, especially, its consequences depend on individual characteristics and previous experiences (e.g. past work positions). Notably, solutions that are possible to some groups are precluded to others, creating a social stratification that goes beyond and, sometime, against, the availability of social and economic support.

All the above considerations refer to analyses carried out at the individual level. Nevertheless, sociodemographic characteristics must be framed in a specific social context. A sociodemographic characteristic has not a value in itself. The social interpretation of that elements is what really matters. If we wanted to push this idea to the limit, we could adopt a purely constructivist perspective (Berger and Luckmann 1966). We could state that the effects of any sociodemographic characteristic are, in reality, the indirect influence of the social context. Nevertheless, this is not what the scientific community usually recognizes as an effect of the social context. When researchers speak about the effects of the social context, they consider a limitation or an opportunity given by the inclusion of individuals in a defined social frame. For example, living in an area with few work opportunities or during an economic crisis is a direct effect of the social context that reduces everyone's possibilities to find a job, even if not homogenously. The influence of social context on work trajectories is the core of our further analyses. Firstly, we need a thorough understanding of the main social and geographical context of our thesis: Switzerland. This is the main objective of the *second empirical study (chapter 3)*. In particular, we analyze the regional differences in Swiss economy and labor market. This chapter introduces and shows empirically the direct influence from the socio-economical context to individual work careers. In order to have a portrait of the current Swiss labor market, we compare the Swiss cantons on a wide set of economic and labor market characteristics. The result of this operation is a typology that includes three types of Swiss labor markets. A first group that includes marginal labor markets with local-based economies that are poorly attractive for workers of other territories (in Switzerland or abroad). A second group that includes multicenter labor markets that have a relatively large urbanized territory with many attractive areas (usually the biggest cities). A third group that includes highly attractive metropolitan labor markets that have only marginal boundaries with the local economy due to the presence of international companies and high-tech firms. They strongly attract commuters from other cantons and, in some cases, the nearby European regions. Given the characteristics of these labor markets, it is possible to hypothesize which influence each type of labor market has on individual work careers. To test the heuristic power of our typology and to introduce an empirical example, we study the job-related relocations of a sample of Swiss workers. We hypothesize that some labor markets attract specific workers, notably in terms of level of education and the sector of activity. Our data confirm these hypotheses and provide empirical support to the theorized typology as well as to the claim that we observe a direct influence of the socio-economic context on the individual work careers.

The *third and final empirical study (chapter 4)*[3] starts from the results of the former two chapters and analyzes the effects of a life course transition that is external to individual work sequences, but has a strong influence on them: childbirth. These analyses, like those in chapter 2, have a longitudinal perspective and are centered on a specific transition and its consequences. Unlike the first study, we now introduce a direct influence of the socio-economic context, the relation showed in the second study. We chose to analyze the work transitions around a childbirth as this life course turning point has been proved to be connected with all the elements we include in the analysis. The interactions between childbirth and work careers are very well established in the literature (Davia and Legazpe 2014; Girardin et al. 2016; Le Goff and Levy 2016; McMunn et al. 2015; Oesterle et al. 2010; Pollock 2007), as well as the connection between reproductive behaviors and socio-economic context (Bacci 2001; van de Kaa 2001; Krüger and Levy 2001; Lesthaeghe and Willems 1999). Consequently, childbirth is among the life course transitions that show how life course transitions can be used to bridge different life course domains and the socio-economic context. In addition to these elements, previous contributions show how reproductive behaviors are sensitive to changes in the socio-institutional context, in particular, the legislative frame (Albagli 2011; Carneiro, Løken, and Salvanes 2011; Dahl et al. 2013; Danzer and Lavy 2013; Dustmann and Schönberg 2009, 2011; Liu and Skans 2009; Rasmussen 2010; Rossin-Slater, Ruhm, and Waldfogel 2011). In order to evaluate the effects of the socio-economic context, we compare two contexts: Switzerland and British Columbia (Canada). We consider the context in two ways. On the one hand, we use previous studies and the results of the previous chapters to describe the cultural and economic differences between these two geographical regions. In particular, we focus our attention on the representations of women's work and on the presence of family-friendly labor markets. On the other hand, we consider one of the main legislative elements that connects individual careers with childbirth: the maternity leave program. In particular, we focus our attention on three elements of maternity leave stressed by the literature: the presence and the amount of monetary benefits (Baum 2003; Waldfogel 1998), the presence of mandatory leaves (Baker and Milligan 2005; Erosa, Fuster, and Restuccia 2005), and the length of the maternity leave (Akgunduz and Plantenga 2013). These measures are strictly statistical and can be easily compared. The legislative frame is surely only a small part of the socio-cultural context, nevertheless,

[3] This chapter is written in collaboration with Ashley Pullman (University of British Columbia), and under the supervision of Professor Sylvia Fuller (University of British Columbia) and Professor Lesley Andres (University of British Columbia).

we cannot deny the bidirectional relationship between cultural context and laws. On the one hand, laws are established by people that have specific cultural references. On the other, laws contribute to direct individual life courses, and, consequently shape the culture. In addition, the study of maternity leave programs in Switzerland and British Columbia give us the possibility to study a strong change in the legal context. Switzerland experienced a reform of the maternity leave law in 2005. Canada passed through a similar process in the same period (2001) and can be used a comparison. Given this parallel change, we can split the cultural context, which remains rather stable in the space of few years, and the legal frame that, literally, changed overnight, and study the interactions among the two. Our descriptive results show a significant difference in Swiss and Canadian individuals' work careers around a childbirth, in particular, referring to women. In both countries, a gendered labor market is observed, with women more likely to occupy part-time positions and men more likely to be in full time positions. Nevertheless, this structure is much more prominent in Switzerland while, in British Columbia, careers appear to be more diverse. This difference is accentuated by the birth of a child. Comparing the careers of people who experienced childbirth before and after the maternity leave reforms, we observe a change only in British Columbia. These changes are in line with the objective of the reform as they record (a) a stronger presence of long maternity leaves, and (b) an increment of mother reintegration in full-time work positions after the end of the maternity leave. Starting from the empirical results, we state that the greater impact of the Canadian reform is principally due to a more significant change of maternity leave length. Hints stressing the importance of cultural difference are also present, but not conclusive. In particular, the analysis of work careers suggests that Canadian parents try to solve the contrasts between parenthood and labor market issues privileging goal-oriented approaches. These approaches seem to be more prone to adapt to changes in the legal frame and goes to the detriment of tradition-based. At the contrary, tradition-based approaches seems to be more present among Swiss parents, and less flexible to changes in the surrounding context.

In the conclusions, we sum up the path taken by our analyses. We start from the description of work careers and we analyze the interaction between work careers and a set of covariates at the individual level (chapter 2). Then, we introduce the social context (chapter 3). Finally, we analyze the relation between individual work careers, life course dynamics, and the socio-cultural context trough the study of a specific, but vastly studied, event: the birth of child (chapter 4). This step by step analysis provides a detailed portrait of how a life course turning point triggers processes that, starting from

work careers, affects the entire individual life. We conclude by reconnecting our empirical results to the theoretical discussion introduced at the beginning of our thesis. In particular, we explore the contribution that our thesis can make to the issues that are currently at the center on the discussion in life course studies.

CHAPTER 1

A theoretical base for the analysis of critical events in work trajectories

1.1 A theoretical chapter?

In today social sciences, a theoretical part is an important element of any scientific work. Theory frames the empirical analyses and the strategy based on the empirical test of theoretical hypotheses is largely diffused (Abbott 2001; Goldthorpe 2001). Nevertheless, if we take critical look on the discipline, we notice that this opinion is not universally accepted in the past and, even in the present. From the early positivism to contemporary big data analysis, the tendency to remove theory (or put it in a subordinate position) is a recurrent idea. For example, in a period from the sixties to the eighties, many scholars joined the "social indicators movement" (see Zajczyk 1998 for an overview). This paradigm rejected, at least partially, the presence of guiding theory. The presence of theoretical assumptions was seen as a risk that could undermine the objectivity of the researcher and bias the results. Interpretation and theoretical assumptions do have a place, but only after and subordinated to the empirical data. This approach is not limited to quantitative (i.e. statistic-based) analysis. Theories supporting the primacy of empirical data over theory are also present in qualitative (i.e. non-numeric) analysis. For example, when Glaser and Strauss proposed their "grounded theory" (Glaser and Strauss 1967; Strauss and Corbin 1994), they define it as a "general method of comparative analysis" that pursue "the discovery of theory from data" (Glaser and Strauss 1967: 1). Even if they admit that one of the roles of sociological theory is to "guide and provide a style for research on particular areas of behavior" (Glaser and Strauss 1967: 3), they stress how an excessive attention for the verification of abstract ideas has overshadowed another analytical approach that use the empirical information to define and validate new concepts. Despite the limitations of the just quoted approaches (Corbetta 1999; Hughes and Sharrock 1997), especially in quantitative research, their legacy remains and it is present in many researches. Often this influence is implicit and takes the form of an effort toward objective, data-driven, observation against a theoretical, researcher-based, interpretation. This is not a simply methodological problem, as it addresses the role of the researcher in the analyses and can significantly change the results. Consequently, a discussion about the premises of the analyses and the interpretations in the following chapters cannot be left tacit. In this thesis, we adopt an analytical approach that often relies on general theoretical assumptions, in order to provide more room for the information coming from empirical data. Theory is indeed present but is a starting point and a help for the interpretation, not a rigid explanatory scheme. Nevertheless, we acknowledge that the empirical analysis cannot be split from an underlying theoretical background. On the one hand, theory is necessary to give a frame to the research. Even if no explicit hypotheses are formulated, the required

standardization of quantitative research prevents the possibility to simply dive into the social reality. Questionnaires need to be prepared, and tested, the decision about which questions will be asked have to be taken, and a set of possible answers have to be provided. These are theory-based decisions. Then, when the data are analyzed: the choice of the variables and the methods are other theory-based decisions. On the other hand, we are social actors before and in parallel to being researchers, with all our knowledge, preconceptions and ideas on the surrounding world. We cannot completely remove them from our work. Nevertheless, there is a difference between being aware of these influences, with the connected limitations, and be an "activist-researcher" (Choudry 2013, 2014; Lewis 2012). In this work, we try to be as neutral as possible, despite the importance that issues like unemployment or maternity leave have in the political arena. We try to keep the information coming from previous empirical research and the scientific reflection of other scholars, and we strive to remove personal bias and preconceptions from our arguments.

Given the "light" presence of the theory in the empirical chapters, we use this first chapter to bring an extended discussion of all the elements that are left implicit in the further sections of this thesis. *First*, we provide an exposition of the general approach we adopt, describing the theoretical and, to some extent, philosophical background of this work. This discussion is a useful instrument to understand the motivations behind numerous choices present in the following chapters. It provides all the theoretical elements that cannot be explicated in the empirical chapters because they are too general or need too much space to be fully explained. At the contrary, specific hypotheses and the literature referred to the specific social relations analyzed in each empirical study are included in the analytical chapters. These theoretical parts are relatively short, but precise and strictly fitting the analyses and the results of that specific chapter. The *second objective* of this theoretical chapter is connected to the first and refers to our position in the ongoing scientific debate. In social science, specifically in sociology, a shared paradigm is lacking. This is not uncommon in science. Even the natural sciences, physics for example, include divergent paradigms when it comes to cutting-edge research issues (for example, the interpretations of quantum mechanics are numerous). Nevertheless, in sociology, the differences are rooted in the very fundament of the discipline. Showing his/her background theoretical approach, the researcher automatically takes a position in this underlying debate. For instance, the life-course approach (Elder 1974; Mortimer and Shanahan 2004), that is introduced in the next sections of this chapter, is a perspective that stresses (among other elements) the importance of longitudinal analysis. This characteristic goes beyond a mere methodological reflection and even touches the conception of causal relations (see section 5, in this chapter). The

third objective of this theoretical chapter is to introduce a set of theoretical reflections that are debated in contemporary literature and tested in the empirical chapters. In the last part of this chapter, we simply present these issues, while an empirical-informed discussion of our contribution is presented in the conclusion to this thesis.

1.2 Theoretical background: quantitative sociology

In this section, we discuss a part of the theoretical background that is often taken for granted, but that would deserve more attention given the numerous assumptions it implies. The empirical part of this work can be entirely included in the subfield statistic-based, or quantitative, sociology. Even if this approach is often categorized as a mere methodological perspective, the theoretical and epistemological implications are numerous and, sometimes, criticized (see, for example, Micheli 2006). We can, at least, introduce five elements that characterize contemporary quantitative sociology (Corbetta 1999):

1- The relation between theory and empirical results is dialectical.
2- The experience and the identity of the researcher is an external element to the analysis. The complete neutrality of the research is unachievable, but quantitative researchers often strive to be as neutral as possible, or act as so.
3- Standardization is mandatory. Every measure must be comparable and the same instruments of analysis must be used.
4- Concepts are coded into variables. Variables and their relations are the real objects of the analysis.
5- The relations between the variables are measured with a structured analytical instrument (usually a statistical model) that is not influenced by the data.

The first point describes the dialectic relation between literature and empirical data. A review of the literature provides the base for the research and, when possible, some hypotheses. Then, these theoretical positions are tested in the empirical analyses. Finally, these results are used to add elements or to falsify the existing literature. The empirical studies in this thesis (chapters two, three, and four) follow this structure. A brief and very specific review of literature is presented at the beginning of each analytical chapter. Using this review, we define a series of hypotheses that are tested in the empirical analysis. Then, in the conclusion of each chapter, we use the empirical results

to go back to the theory and, possibly, falsify our hypothesis, or add further elements to the theoretical debate.

The second point describes the role of the researcher. Usually, quantitative sociology conceives the role of the researcher similarly to how it is considered in (classical) natural sciences. This conception splits the identity and the experiences of the researchers from their results. In this sense, the researcher is neutral and external to the research. Nevertheless, researchers in both contemporary natural and social sciences are well aware of the limits of this approach. In a process that started at the beginning of the last century, all the disciplines that imply numeric measures have abandoned the classic premise of the non-influence of the observation. Even in (quantum) physics, the interference of the observer is a well-established concept (Manning et al. 2015). In quantitative social sciences, the concept of a non-neutral researcher was definitely established in the seventies toward the mutual influence of positivistic and interpretative sociology that followed the crisis of anthropology and the convergence of social disciplines that occurred in that period (Marzano 2006). "Quantitative" research has a strictly standardized procedure to the creation and codification of data. Nevertheless, these procedures limit, but do not exclude, a certain discretionary power in the creation of the data. Researchers in quantitative sociology choose the variables to use and how they are defined, they establish the method, and they prepare the data (weighting, missing data management, or any other operation of data reduction). All these actions are not neutral and can influence the results. Nevertheless, a precise description of the analyses and rigorous application of the methodology enhances the robustness of the results. In line with these principles, we conceive this influence of the researcher as a "necessary evil" and we try to reduce any distortion given by personal values. This approach is easier when, like in our case, the study is structured on secondary analysis, i.e. on the analysis of data already collected and organized. When the researcher who produces the data (research design, data collection) and the researcher who analyzes them are different, there is a lower risk of an excessive arbitrariness. In this thesis, we completely rely on data from external sources. We use the Swiss Household Panel (Voorpostel et al. 2015) in the first and third empirical study (chapters 2 and 4), data from the Swiss Statistical Office interactive database (STAT-TAB) in the second (chapter 3), and the Paths of Life cohort study (Andres and Wyn 2010) in the third (chapter 4).

The *last three elements* that characterize contemporary quantitative sociology provide practical information on data analysis. They are based on a common and more general assumption: the possibility to describe the (social) reality with a mathematical model. This approach has a very long history and it is now omnipresent in natural sciences. Galileo Galilei writes in 1623: *"Philosophy*

[included science] is written in this grand book, the universe, which stands continually open to our gaze. But the book cannot be understood unless one first learns to comprehend the language and read the letters in which it is composed. It is written in the language of mathematics" (Il Saggiatore, page 238). This approach entered in the social sciences through positivism (Comte 1842) and it is well established in today's quantitative sociology. As opposed to other languages, mathematics has an incorporated logic. This means that a mathematical formulation needs a precise formalism to be understandable. Given this structure, any mathematical formulation is an abstract concept that can be applied to different phenomena (Barrow 2009). This assumption justifies the application of the same mathematical model to different domains. Coherently with this view, we can support our analyses with mathematical (more precisely, statistical) methods that are not exclusive to social sciences. The methods that are largely used in this work are sequence analysis (see, for example, Abbott 1990) and regression analysis (see, for example, Venables and Ripley 2002). Sequence analysis is a statistical method that originates in biology (Sanger and Tuppy 1951) and is used in a variety of disciplines from physics (e.g. Grassberger, Schreiber, and Schaffrath 1991) to informatics (e.g. Lin, Jiang, and Chao 2002). Regression analysis is even more widespread and it is used in every discipline that implies the approximation of multivariate trends and relations. Both of these methods aim at finding patterns or relations that remain hidden behind the empirical information. This strategy is based on the belief that the natural and, for extension, social world has an underlying, but knowledgeable, mathematical structure that legitimates the presence of underlying (mathematical) rules behind any phenomenon. Nevertheless, the presence of mathematical rules is not applied in a mechanistic way. With a process that started in the late nineteenth century, continued with the approach to scientific knowledge of the "logical positivism" (Bunge 1996), and completed in the fifties (Eells 1991; Salomon 1980), science has abandoned a model grounded in mechanistic relations in favor of *probabilistic links* (Neyman 1975). Similarly to other disciplines, in social sciences, this shift was gradual and, according to some authors (for example, Goldthorpe 2016), it is not completely incorporated. Moreover, social sciences took an original path that, even if connected to the evolution of other disciplines, remained distinct. Duncan (1984) shifted the aim of quantitative sociology from the search for universal laws to the description and explication of the behaviors of the individuals analyzing the between-group differences to the (temporary) detriment of within-group individual differences. This focus on the empirical-driven analysis of behaviors and the attention for "social regularities" (Goldthorpe 2001) had a vast success in the successive decades. Today, the majority of researchers in contemporary quantitative sociology (sometimes, implicitly) assume that, when it

comes to describing social phenomena, "statistics is, if not the only, at all events the most reliable and versatile mean of demonstrating that […] regularities exist and clarifying their nature" (Goldthorpe 2001: 10). Nevertheless, on the epistemological level different approaches try to frame the use of statistics in more general approaches to the scientific knowledge of social phenomena. Some researchers (e.g. Rein and Winship 1999) look at evolutionary biology as a model. In this perspective, social sciences should embrace the absence of predictive power and high correlations and rely on the observation and classification of information of a different nature. Other researchers, notably Goldthorpe (Goldthorpe 2000, 2001, 2016) but also others (e.g. Xie 2005, 2006), try to define quantitative social sciences as a "population science". Following Neyman (1975), they conceive social sciences as similar to natural sciences. Consequently, their attention is focused on the analysis of social regularities applying a research approach that can be defined in three steps (Goldthorpe 2001): (a) establishing the phenomena that the researcher wants to explain, (b) hypothesizing generative processes at the level of human action, and (c) testing the hypotheses. Following this procedure, the researcher is able to provide a description of inter-group variability, purged from (irreducible) intra-group variability (Xie 2006).

Despite these divergences on the epistemological level, a sort of empirical pragmatism attenuates the differences between the diverse approaches to quantitative sociology. Most of the studies follow the structure described by Goldthorpe, even if some researchers claim for a greater role of classification and description, to the detriment of causal explanation (Abbott 2001). As refers to this thesis, our work can be completely inscribed in the field of quantitative sociology. We largely applied statistical models, and we mainly approach the analysis from a frequentist point of view (Neyman 1977). Nevertheless, some elements of Bayesian statistics (Gill 2014; Pisati 2003) are present in the first empirical study (chapter 2). All the empirical chapters rely on statistical analysis both for the descriptive and the inferential phase. Statistics is used to describe individual behaviors and to test our research questions. Moreover, the modeling and the discussion of longitudinal relations, especially at the individual level, is one of the recurrent points of discussion of this thesis. Even, in the methodological annex to chapter 2, we focus our attention exclusively on the technical analysis of individual-level longitudinal data, proposing a new strategy to combine different types of longitudinal data. On a more epistemological level, our results can be easily framed in the just described population science approach to quantitative sociology (Goldthorpe 2016; Xie 2006). In all the empirical chapters, we, first, establish the phenomena that we want to explain, referring to previous studies and theoretical reflections. Then, we set specific hypotheses (chapter 2 and 4) or define our objectives,

and we anticipate the possible explications behind the observed variability (chapter 3). Finally, we use statistical methods to test our hypotheses. Even if the data refers to the single units of analysis (individuals for chapters 2 and 4, administrative areas for chapter 3), all the analyses refer to the comparison and the explication of inter-group variability given by socio-demographic (chapter 2 and 4), geographic (chapter 3 and 4), or temporal (chapter 4) differences. If we consider the entire thesis, this structure is less evident, but still present. The main issues discussed - i.e. a theory of human action, the heterogeneity and the longitudinal structure of life courses - are introduced later in this theoretical chapter. Nevertheless, given the extent and the complexity of these subjects, the idea to offer an explication must be dropped, in favor to a less ambitious and more realistic approach that has the objective of providing a contribution to the ongoing discussion. In this variation to the general approach, the hypotheses became axes of contributions that turn in very specific hypothesis only when we approach the empirical analysis. Despite these changes, the empirical verification of the hypotheses remains the central point that supports the theoretical discussion and gives credits to the contributions proposed in the conclusion of this thesis.

1.3 Theoretical background: the life-course paradigm

The birth of the life-course paradigm is commonly linked to the publication, in 1974, of *Children of the great depression* by Glen H. Elder Jr. (Mortimer and Shanahan 2004; Sapin, Spini, and Widmer 2007). As any historical event describing the birth of a concept, this choice is merely arbitrary. The interest in the interaction between life-course events was already present in social sciences before. We can describe (at least) four ancestors of the life-course paradigm: "life history" sociology (Thomas and Znaniecki 1918; Shaw 1930; Sutherland 1937; Hagood 1939), social history (Curti 1959; Hanlin 1959; Thernstrom 1964; Tilly and Scott 1978), developmental psychology (Hall 1904; Piaget 1932, 1936; Kohlberg 1958; Erikson 1959), and the sociological studies on inequality (De Solla Price 1965; Merton 1968). These approaches provided specific elements that were developed in the life-course paradigm (and that we discuss later in this section), but also a general attitude toward the study of society. Already at the beginning of the twentieth century, Thomas and Znaniecki describe the lives of Polish immigrants in the Unites States using an approach close to a life-course perspective (Thomas and Znaniecki 1918). The authors describe individual lives framing them in families, friends, and community networks. This approach was later defined as "life history" perspective, as it relied on the recoding of long narrations of individual life course in order to describe the conditions of a

specific group. This perspective was then developed and applied to other field of research, from criminality (Shaw 1930; Sutherland 1937) to mothers' conditions in rural Unites States (Hagood 1939). Among these studies, a research approach that had a relevant impact on successive literature was the work by Everett Hughes. In his study, Hughes (1950) describes individual careers as sequences divided by transitions that can be short or long, ritualized or not, but always identifiable. The study of both the sequences and the transitions is applied in many contemporary research, and Hughes' approach is considered the precursor of the concept of turning point (Grossetti 2006), which we largely discuss in the section 4 of this chapter. Despite these foundational contributions, the sociological studies of life courses took multiple directions without a common analytical or theoretical frame. In addition, they were often neglected (Elder et al. 2004). Volkart's (1952) and Mills' (1959) calls for a greater attention in the study of the intersection of biography, history, and social structures clearly show a lack of interest by sociology for the social pathways of human lives in the period that goes from the thirties to the sixties at least (Elder et al. 2004). An attention that, in the same period, was growing in history, in particular in the sub-discipline of social history. Working with census records, administrative data, and interviews, historians described individual life courses of people in several contexts, such as rural (Curti 1959) and urban (Thernstrom 1964) Unites States. A particular attention was given to non-dominant groups, such as women (Tilly and Scott 1978) or marginalized ethnic groups (Hanlin 1959). Breaking the traditional boundaries of the discipline, these scholars introduced a history of common people. Starting from an historical perspective, they approach the study of life courses in their historical period. In the same years, a parallel and (almost completely) independent tradition approaches the development of life courses from a psychological point of view. Following the pioneering contributions by Hall (1904), a number of psychologist create what is today known as "developmental psychology". Classic researches in developmental psychology start from the study of a specific psychological trait, such as individual morality (Kohlberg 1958) and knowledge (Piaget 1932, 1936), or approach the entire psychosocial identity (Erikson 1959), to create a conception on individual life courses based on standardized "stages". Unlike in life-history sociology and social history, the stages in developmental psychologies describe, but also, prescribe a healthy life course. Individual life courses are described as a series of stages strictly connected with age. In order to develop the analyzed psychological processes, individuals have to pass toward each stage in the right order and in the right time. Otherwise, an incomplete development of personality leads to abnormal psychological statuses and behaviors. Despite these normative elements, that are not integrated in successive life-course theories, developmental

psychology introduced the idea of a common pattern in individual life courses that can be described through stages and transitions. A last pre-existing tradition that largely influenced the life course paradigm is the sociological studies on inequality. Researchers studying inequality observed what we can define, using a successive terminology, a "cumulative advantage/disadvantage" (Dannefer 2003a), i.e. the longitudinal dynamics of inequality. De Solla Price (1965) and, later, Merton (1968) introduced the idea that individual states has a longitudinal dimension and past statuses influence the current individual condition. This approach is firstly limited to specific sectors. i.e. the power dynamics in the scientific community (Merton 1968), and then extended to all the social relations. Despite these studies started before the (conventional) birth of the life course approach, they are developed all along the past decades (Dannefer 1987, 2003a; Merton 1988; O'Rand 1996) sometime in relation with the life course paradigm. Toward this mutual influence, life course analysis specified the conception of a life-long development introducing a still discussed (Abbott 2009; Walther 2014) conception of causal relations across the life courses that consider both individual and collective effects.

The entire scientific community, included Elder himself (Elder et al. 2004), recognizes that the life-course approach was strongly influenced by preexisting works in the fields of life-history sociology, social history, and developmental psychology. Nevertheless, it also attributes to Elder the merit to have organized the different cues coming from these disciplines in an organic approach. This is obviously a conventional decision, as the theoretical frame we now know as life-course approach was developed during decades, and *Children of the Great Depression* (Elder 1974) has many limitations that are typical characteristics of the early contributions to a new field of study. Starting from a sample of 167 people born in 1920-1921 and included in the Oakland Growth Study, Elder studies the life courses of a cohort of people who experienced (at least) two mayor historical events: the American Great Depression, started in 1929, and the Second World War. Comparing their life courses with the experiences of other members of their families, Elder stresses the importance of a historical, geographic, and generational frame in the understanding of individual biographies. Nevertheless, the generalization of this theoretical statement as line of research for a new sub-discipline is more implicit than extensively discussed. Rather than a manifesto of the life-course approach, *Children of the Great Depression* is an extended empirical and theoretical example on applied life-course research. Elder returned on his approach in successive works, both with theoretical essays (Elder 1985, 1994, 1995, 1998) and further empirical applications (e.g. Elder 1986). His approach to the analysis of individual biographies had a strong influence on the following literature, and the life-course paradigm expanded

beyond the initial boundaries. From life courses that were involved in strong historical turning points, researchers' attention shifted to more common experiences and applied the life-course approach to a wide set of life transitions characterized by a strong social normativity, especially when it comes to the timing of transition (Neugarten and Datan 1973). Common experiences (e.g. childbirth, marriage, unemployment) were conceptualized as trigger events for transitions of individual life courses, and the base to define a population of study. Also, the concept of long-term consequences has been modified to include medium-period events that are neither necessarily connected with the individual's psychological development, nor have life-long repercussions. For example, in the first analytical study (chapter 2), we investigate unemployment scarring i.e. the (negative) effects of a period of unemployment on the subsequent career. This concept comes from economics where it is classically operationalized as a wage penalty (Arulampalam, Gregg, and Gregory 2001; Arulampalam 2000; Narendranathan and Elias 1993). Nevertheless, it can be approached from a life-course point of view as it implies long-term consequences, and defines a population that has experienced a highly normative event. Given the enlargement of its basic concepts, contemporary studies in life course research include a plurality of topics from teenage childbearing (Furstenberg 2003b), to intergenerational relations during adulthood (Greenfield and Marks 2006; Swartz 2009), from the connection between employment and family formation (Davia and Legazpe 2014), to the consequences of traumatic experiences (Macmillan 2001), from stress dynamics (Bolger et al. 1989), to the analysis criminal careers (Sampson and Laub 1993).

Despite this variety of applications, all these studies respect five basic principles that were gradually developed during the last decades and are now the basis for any analysis framed in the life-course paradigm (Alwin 2012; Elder 1995; Elder et al. 2004; Sapin et al. 2007):

a) The principle of "life-span development". The changes in individual conditions are considered over a long span of time, if possible, the entire life.
b) The principle of "agency". Despite the existence of historical and social constraints, individual choices are determinants in the definition of their life courses.
c) The principle of "time and place". This is the other side of the coin of principle b): Individual choices are important, but need to be framed in a social and historical context.
d) The principle of "timing". The consequences of life transitions are strictly linked to the moment of individual lives in which they happen.
e) The principle of "linked lives". Individual life courses influence and are influenced by the life courses of people that are part of a same network.

To these five principles, some authors (e.g. Mayer 2009) add two more elements:

f) Life course analysis has an anticipatory potential given its longitudinal structure. This characteristic makes life course analysis particularly useful for policies focused on preventive intervention.
g) Life course transitions have to be studied across life domains, such as work and family.

All these principles include several assumptions and have vast consequences, therefore they all need an in-depth explication.

The principle of "life-span development"

The principle of "life-span development" can be seen as a generalization of some results introduced in developmental psychology and in the sociological studies on inequality, two of the main historical and conceptual roots of the life course approach.

The idea that the individual identity is under constant modification that happens in steps between phases is the basis of *developmental psychology* and was applied to the formation of personal morality (Carpendale 2000; Kohlberg 1958; Levine, Kohlberg, and Hewer 1985), knowledge (Piaget 1932, 1936) or, even, the entire psychosocial identity (Erikson 1959). A pioneer of this approach was the Swiss psychologist Jean Piaget who created an articulate theory on the formation of individual knowledge (Piaget 1936). Piaget's theory implies a transition between four main periods (then, divided in sub-periods for analytical purposes): (1) sensory-motor, (2) pre-operational, (3) concrete operational, (4) formal operational. According to Piaget's stages, the children's approach to knowledge transits from a model based on reactions and physical interaction with the environment to a model based on symbols and abstract concepts combined using a formalism shared with other individuals. The novelty of the approach is the description of infantine evolution as a continous from a basic state to a more complex one. The idea of a pattern on sequential and correlated states was strongly influential for the subsequent research. For example, Piaget's theories influenced another main developmental theory: Kohlberg's stages of moral development (Kohlberg 1958). Starting from Piaget's reflections on morality (Piaget 1932), the author identifies six stages that compose a mandatory path for the growth of children's morality: (1) obedience and punishment, (2) self-interest, (3) interpersonal accord and conformity, (4) authority and social-order maintaining, (5) social contract orientation and (6) universal ethical principles. The morality is described as a passage from a moral strategy based on the direct consequences of personal choices to a moral strategy based on

abstract reasoning that starts from universal ethical principles. In the following decades, Kohlberg's initial theory faced many critics, and was adapted and updated several times (see Levine et al. 1985; Parke, Gauvain, and Schmuckler 2010), but, still, remains a used conceptual instrument to describe children moral development (see, for example, Koh 2009). Even if both Piaget's and Kohlberg's theories have a strong longitudinal and procedural structure, they are limited to a specific section of the lifespan, from birth to 24 months for Piaget and from 10 to 16 years for Kohlberg. Keeping the same structure, other researchers expanded the idea of a common pattern in psychological development and formulated a development theory that covers the entire life course. Among them, Erikson's (1959) theory of stages of psychosocial development is one of the most influential contributions. Erikson's theory includes eight steps: (1) infancy (0-18 months), (2) early childhood (18 – 36 months), (3) play age (3 to 5 years), (4) school age (5 to 12 years), (5) adolescence (12 to 18 years), (6) young adulthood (18 to 40 years), (7) adulthood (40 to 65 years), and (8) maturity (65 or more years). These steps cover the entire life span, but this theory remains largely focused on childhood and adolescence (five out of eight steps are referred to this section of the life course). Other age periods seem neglected. Central ages are collected in two steps, and a single step collects the old age. Similarly to precedent theories, Erikson states that his eights steps are compulsory for the formation of an healthy personality that acquires a series (one for each step) of psycological traits, that Erikson calls virtues. This approach derives explicitly from the psychoanalytical approach (Freud 1923) and implies a strong normative dimension. Coherently with this approach, the psychological development is described as the result of a tension between psychological elements of the self. Nevertheless, unlike previous theories, Erikson introduces a strong relevance of the social context. Each psycological trait (virtue in Erikson's terminology) results from the conflict between the needs of the individual and the needs of society. Individual psycological development is framed in a social and cultural context, and children's socialisation is one of the main bases of the developmental process. These ideas were very influential on sucessive developmental psychology and they are often quoted as one of the main base of the principle of "life-span development" in the contemporary life course approach in social sciences.

The other historical and conceptual root of the principle of "life-span development" comes from the *sociological studies on inequality*, and the enquiry of what is known, with a statitical terminology, as path dependency (Nelson and Winter 1982). This concept implies that past statuses influence present and future development of a specific life course domain. These statuses can be the consequences of individual choices (e.g. education track) or pre-existing characteristics (e.g. social class). Some

researchers introduced this idea in sociology (see e.g. De Solla Price 1965), but, for an explicit formalization, we have to wait for Merton's Matthew Effect (Merton 1968). The concept is inspired by the sentence reported in the Gospel of Matthew, chapter 25, verse 29: *"for whoever has will be given more, and they will have an abundance. Whoever does not have, even what they have will be taken from them."* Merton takes the teaching of this biblical verse and translates its meaning from the spiritual to the material and the social world. He postulates that social advantages and disadvantages cumulate over time. Merton focuses the attention on prestige in the scientific community. Those who are in a prestigious position, for instance Nobel prize winners, are expected to act and to have competences in line with their position. As a consequence, they will be more easily credited for results acquired collectively, given the expectations connected to their status. On the contrary, the contribution to the same work by an unknown scientist will more easily pass under silence. These processes trigger vicious and virtuous cycles that reinforce the acquired positions (or resources) and make their changes difficult. In the following years, Merton's intuition is crossbreed with the advancements in gerontology that occurred during the same period(Ryder 1965; Schaie 1965), in particular the importance of cohort analysis. The result is the "cumulative advantage/disadvantage theory" that is developed in the following years (see e.g. Dannefer 2003; Merton 1988; O'Rand 1996) and it is now an established interpretative frame in social sciences. We can define the cumulative advantage/ disadvantage theory as "the systemic tendency for interindividual divergence in a given characteristic (e.g., money, health, or status) with the passage of time" (Dannefer 2003, p. 327). Unlike in developmental psychology theories, the tendency is "systemic" and the divergence is "interindividual", as it is produced by the interaction between individuals in a social and cultural context, and it is typical of groups more than individuals. Furthermore, there is not a deterministic relation, but a tendency that leaves room for counterexamples.

The principle of "life-span development" takes several elements from both developmental psychology and the sociological studies on inequality, and synthetizes them in a new form. From developmental psychology, life course analysis takes the ideas of an individual development based on stages that cover the entire span of life and that are linked to the passing of time. Nevertheless, life course analysis is far less normative and is disconnected from the idea of a "healthy" development, an element directly coming from psychiatry. The development is open to different and legitimate paths. From the sociological studies on inequality, the life course approach takes the importance of the interaction among individuals, and the systemic tendency for interindividual divergences. All these elements stress the importance of a longitudinal study of individual life courses.

In this thesis, this principle is one of the main theoretical references for the analytical design of chapter 2 and 4. In both these studies, we consider a medium-range period around a life course transition. In chapter 2, we analyze individual careers in the 4 years around the first month of unemployment. In chapter 4, we study the 48 months around childbirth. The analysis of this span of time on individual careers, both before and after a transition, provides two advantages: On the one hand, we can precisely frame the transition in the different stages of the life course. On the other hand, we can differentiate the age effects from the effects of life course stages. The psychology of development has shown that these differences are partially due to the connection between biological age and certain phases of the life course. Nevertheless, it is not rare to observe cases of "non-normative transitions" (Furstenberg 2005), i.e. anticipated or retarded events, or life courses that challenge more widespread, or socially accepted, patterns. Comparing the periods around a life course transition and using the age as a reference, allows us to explore the presence of uncommon patterns or of events "out of time". These patterns and these events can be connected with the analyzed life course transition and used as elements to explain its effects. This type of study is extensively done, especially, in chapter 2 where the described age effects of unemployment scarring (i.e. what happen after the beginning of the period of unemployment) are independent from the effects of the employment situation before the period of unemployment. In addition to these elements, the accumulation of advantages and disadvantages is a constant element of the empirical studies in this thesis. Most of the effects of the life course transitions are interpreted using this theoretical frame.

The principle of "agency"

The debate around the importance of individual agency in relation to the influence of social constrains has roots that go back to the beginning of sociology, and even before, in the field of philosophy. Despite this long history, the debate is still open in contemporary social sciences. The theories on human agency are numerous and take position between two extremes that, following Goldthorpe, we can call: "rational action theory and norm-oriented action theory" (Goldthorpe 2001: 12).

Rational action theory collects all the approaches that describe agency as the main determinant of individual life courses. This paradigm postulates that individuals are, at most, marginally influenced by the social and cultural context. At least two traditions can be ascribed to the field of rational action theory and are relevant in the contemporary social sciences. The first is the methodological individualism that can be traced back to Popper's *The poverty of historicism* (Popper 1957). The main

statement of this approach is that society can be reduced to individuals' decisions, actions, intentions, and relations. In contemporary sociology, this approach has different (and moderate) variants (e.g. Billari and Liefbroer 2007; Gecas 2003), and has found an innovative application in agent-based models and computer simulations of social behaviors (Sun 2006). All these positions describe individuals' agency as the main determinants of their life courses, but do not completely exclude the presence of external influences. The second approach that can be described as part of the rational action theory family is economic rational choice theory. This theoretical frame is widely used in economics (see, for example, Becker 1964) and has been adapted to sociology (Goldthorpe 1998). In its economic formulation, it postulates that individuals' agency and goal-oriented thinking are the major determinant of human lives. Social and cultural contexts are often considered irrelevant, or, at most, marginal. In social sciences, this approach has been criticized for a long period, and even some of the theorists that created this interpretative frame went back on their steps and claimed the need for the introduction of the desire for prestige and to conform as well as different forms of social capital (Becker and Murphy 2000). Consequently, when adapted to sociology, it is more prone to include contextual and time-related influences and, to be a considered a model of action among others (Goldthorpe 1998).

The opposite position on human agency can be called norm-oriented action theory (Goldthorpe 2001), and posits a rather complete irrelevance of individual agency. This position was present in early anthropology under the form of cultural determinism (see, for example, Benedict 1934), and is almost completely abandoned in contemporary social sciences.

Between these two extremes there is an immense spectrum of theories that postulates the existence of a relevant cultural frame that favors or obstructs an active individual agency. The life course approach is situated on this spectrum, even if in a position that is not always clear. In particular, it is hard to describe the elements on which individual agency is based and how it relates to the cultural context. Despite almost every researcher accepts Elder's statement that individual active intervention is part of individuals' life-courses (Elder et al. 2004), the same cannot be said for his description of individual agency. Elder describes individual agency as a choice among a limited pull of alternatives: "individuals construct their own life course through the choices and actions they take within the opportunities and constraints of history and social circumstances" (Elder et al. 2004: 11). These choices have repercussions on individuals' life courses especially through the continual restructuration of interpersonal networks that these choices imply (Elder 1997). A similar position is shared by other researchers (Diewald 2001; Settersten and Gannon 2005) and defined as "agency

within a structure" (Settersten and Gannon 2005: 41). Individual life courses are "the result of social institutions, culture, and history *and* the result of decision making, action, control, and personality" (Settersten and Gannon 2005: 42, emphasis in the original text). Despite the closeness with Elder's position, these authors do not describe the social context as a simple limitation to individual agency. Rather, the link between individual agency and the context changes continuously as they are not separate entities but integrated elements: agency is a collective phenomenon (Settersten and Gannon 2005). Consequently, life course research has to avoid to use personal attributes (e.g. age, sex), social characteristics (e.g. social class, ethnic group), and social niches (poor, young, versus other groups) (Bronfenbrenner 1988), in order pay more attention to the links between the individual and the collective level (Settersten and Gannon 2005). The opposite claim is addressed by other scholars (e.g. Billari and Liefbroer 2007; Gecas 2003) that preach a model of human agency largely independent from contextual contains. Gecas (2003), for example, states that life courses are influenced by a multiplicity of social and physical forces, but postulates that "we are to a large extent architects of our life course" (Gecas 2003: 369). Individual agency not only is present in the life course, it is the strongest element of its development. Gecas borrows the concept of self-efficacy from social psychology (Bandura 1995, 1997) and put it, and its variations, at the center of human agency. Nevertheless, unlike in a pure psychological approach (Bandura 1997), Gecas connects individual self-efficacy to the cultural context and the interaction with others, recalling Erikson's (1959) developmental psychology. Despite this modification, the role of the context remains marginal, as it can influence individual psychological characteristics, but it cannot limit (toward explicit norms or prescriptions) individual agency. A similar importance of individual over contextual elements is stressed by Billari and Liefbroer (2007). These authors apply Fishbein and Ajzen's (1975) model of "reasoned behavior" to life course analysis, in particular to the transition to adulthood. Individual intentions are described as determinants in the definition of the direction of life courses. The limitations given by the social context are reduced to the subjective interpretation of social norms, and "the perception that individuals have about whether important others will approve or disapprove of a given behavior" (Billari and Liefbroer 2007: 183). This conception does not exclude social norms, but strongly minimize their magnitude as it reduces them at a generic social pressure coming from personal networks and filtrated by the individual personality.

These different approaches show the lack of a shared theory of human action in the life course paradigm. This problematic issue is shared with all the social sciences (with the exception of, maybe,

economics) and relies, also, on an almost complete impossibility to create a shared definition of agency and social structure (Marshall 2000).
The role of agency in life-courses is a central component of this thesis. Our approach is close to Elder's idea of an individual agency framed in the "opportunities and constraints of history and social circumstances" (Elder and Kirkpatrick Johnson 2002). We discuss this point, and its role in our work in section 5 of this chapter.

The principle of "time and place"

This principle includes two concepts that are debated in many disciplines, from physics to philosophy, and are very challenging to study: time and place.

In the life course approach, *the analysis of time* is a constitutive element. Time is involved in life course transitions under different forms. At the personal level, we find the concept of "timing" of the life course transitions, i.e. the synchronization between individual life course transitions and a shared social calendar. This is the focus of another principle (the "principle of timing"), consequently, we leave the discussion of this element to the next section of this chapter. At a collective level, time is connected with historical changes and the social construction of the time dimension. These subjects were discussed very early in social sciences with seminal contributions already at the beginning of the twentieth century (e.g. Durkheim 1912) and extended dissertations few years later (e.g. Halbwachs 1925). Nevertheless, for a long period, sociology of time was composed by isolated contributions. These contributions interpret time as a social construction (Elias 1984; Gurvitch 1963) and study the multiplicity of time (Luckmann and Schutz 1973) as well as the relation between the social constructions around time and individual power relations (Coser and Coser 1963), in particular, between time structure and gender roles (Adam 1995). Despite these important contributions the sociological analysis of time remained "a much neglected dimension in social theory and research" (Lüscher 1974). Moreover, the research on time shifted from a large-scale theorization to the study of individual-level time uses (Leccardi 2009; Sue 1994). Life course analysis had the merit to bring back the attention to the macro level. In particular, the life course research stresses the relation between historical periods and individual life-courses. For example, life course studies clearly show the influence of different major historical periods on individual life courses, notably the Great Depression (Elder 1974), the Second World War (Elder 1974; Sampson and Laub 1996), or the

Vietnam War (Elder 1986). The definition of the historical periods is, usually, quite wide and includes major historical events as well as less dramatic social changes, for example a legislative change. Coherently with this analytical frame, in chapter 4 of this thesis, we consider two important, but, surely, limited political reforms. We consider the reforms of the maternity leaves occurred in Switzerland in 2005, and in Canada in 2001. These reforms separate two clearly identifiable periods: before and after the reform. we can, therefore, study how individual life courses change due to the entrance in a new period. Given the relative limited impact of these reforms, we study the sub-population that is more largely affected by the change in the maternity leave program: people that become parents. Similarly to Elder's approach, we show how a change in the "historical" period affects differently specific subgroups. Nevertheless, while Elder compares principally age groups (Elder 1974, 1986), we focus our attention on gender differences inside the already specific group of new parents.

Similarly to what happens with the analysis of time, *the influence of place* on peoples' live has a long history, from the classic works of the Chicago School (Park, Burgess, and McKenzie 1925) to recent contributions, like the New Urban Sociology (Gottdiener, Hutchison, and Ryan 2014). Given the variety of studies and almost a century of empirical researches, some definitions are needed. The most important is the clarification of the central element: the concept of (social) space. Gieryn introduces three "necessary and sufficient features" (Gieryn 2000: 464) that define the concept of "space": geographic location, material form, and investment with meaning and values. The geographic location is the simple physical characteristic of being in a recognizable place. Even if simple, this observation is not as trivial as it seems. Recent contributions describe individuals as less and less embedded in the social places where they leave (Beck 1986; Giddens 1990), and the places itself are described as losing their social identity (Relph 1976) and becoming "non-places" (Augé 1992), partially, in favor of cyber spaces (Thomas and Brown 2009). In (implicit) opposition to these contributions, life course studies consider the social identity of places as an element still present and relevant in the formation of life courses (Elder et al. 2004). Nevertheless, the importance of the social identity of spaces eclipses the relevance of their geographical structures. A geographical space and its identity influence individual life courses as it is a social space with its norms and its rules. The material form, the second feature indicated by Gieryn, goes even deeper in the analysis of the bidirectional link between social dynamics and physical environment. On the one hand, human modifications of the environment favor certain social dynamics to the detriment of others (Habraken and Teicher 2000). Spaces are not neutral,

as many social interactions are also physical interactions. On the other hand, certain spaces are the consequence of social and historical movements. These elements are accepted in life course studies, even if not common. For example, Micheli (1999) describes the Italian suburbs as a "swamp" (page 175). Like a swamp, that is neither a river nor a wood, the suburb is not yet entirely part of a city but not a country town anymore. This mixed environment replicates the social condition of its inhabitants that endorse urban lifestyles and values, but lack the possibilities to pursue the same life courses that are common to the urban populations. Finally, Gieryn calls his last feature of space "investment with meaning and values". Places have names and identities that are socially constructed. Places are "interpreted, narrated, perceived, felt, understood, and imagined" (Gieryn 2000: 465). Through the process of social interpretation, the places take new roles and can be an instrument to build identities and shape interindividual relations.

In our thesis, the analysis of social spaces is the central element of chapter 3 and it is strongly present in chapter 4. In chapter 3, we use a wide set of economic and labor market characteristics to describe the regional differences present in the Swiss economic fabric. This empirical study is split in two sections, the first adopts a macro-perspective, with the analysis of aggregate data. The second connects territorial macro characteristics to individual work careers. Our results reveal that territorial and personal characteristics interact and influence people's job-related mobility. In chapter 4, we describe the differences of work careers around childbirth in two territorial contexts, Switzerland and British Columbia (Canada). The characteristics of the two territories enter in the explications of these differences, especially, in the descriptions of the strategies to cope with the possible negative outputs of childbirth. These last results, in particular, are in line with the previous literature on the subject (see Pintaldi 2003) that describes the connection between territorial characteristics and individual work careers. Nevertheless, the social context is one element among the others, not necessarily determinant. Other factors can smooth or, even, eliminate completely this element. For example, Oesch and Lipps' study on German and Swiss unemployed reveals that the regional level of unemployment does not affect the magnitude of the individual consequences of this experience (Oesch and Lipps 2012). Moreover, when aggregate and individual data are used in the same study, the relations between these two dimensions must be carefully approached. The risk of "ecological fallacy", i.e. the confusion between correlations at the aggregate and individual level, is extensively discussed at least from the fifties (Robinson 1950). Given this warning, we interpret the influence of results of social spaces on individual life courses very cautiously. Despite their validity, they cannot

be generalized and, in chapter 4, where their ambivalence is more evident, we present the observed relations as hints for further research rather than conclusive results.

The principle of "timing"

The principle of timing describes a further connection between time and life courses. It states that the same experiences differ depending on their temporal nesting in the in the life course. This principle was one of the main points risen in the *Children of the Great Depression* (Elder 1974). Elders' sample (the Oakland Growth Study) collects 167 people born in 1920-1921. This sample was part of a longitudinal study on psychological and physiological development started in 1932 and conducted at the University of California, Berkeley. This cohort passed through two mayor historical events: the American Great Depression, started in 1929, and the Second World War. They lived the years of Depression during childhood, the war as young adults, and the post-war period, with the successful reintegration of the US military personnel, few years later. Elder compares the life experience of these men and women with the experiences of their parents and siblings (both younger and older). During the Great Depression, people in Elder's sample were in a particular age as they were young enough avoid the stress of the adults, but old enough to have overcome the vulnerable early stages of development. Their parents and their older brothers and sisters lost their jobs and had to face the individual economic and psychological difficulties, as well as the collective disillusion to see the (partial) fall of the belief in the "manifest destiny" of individual and collective success. At the same time, the younger siblings, who were young children during the Great Depression, suffered the psychological downturn resulting from the economic hardship and the difficult social environment (scarce parental attention, very early entry in the labor force, high criminality rates, etc.). This idea was very influential in successive life course research and helped to approach the consequences of important historical periods with paying more attention to the fate of specific cohorts and groups. An analysis that includes these elements yields a more detailed description of historical periods that, sometime, reverse the myths embedded in popular culture. For example, Sampson and Laub (1996) show how the military service in the years including the Second World War and the post-war period (1940-1965) fostered subsequent occupation opportunities for men coming from poor neighborhoods. In the years following Elder's seminal contribution, the concept enlarged and the principle of timing now goes beyond the participation to historical events and includes more usual life course transitions. Similarly to some historical events, all these life course transitions can be experienced at different

ages. Nevertheless, depending on the age, the effects can be dramatically different. In the existing literature, this phenomenon is called "social clock" (Neugarten and Datan 1973; Neugarten, Moore, and Lowe 1965) and is connected to both social normativity and psychological development. This concept refers to the existence of "age norms and expectations [that] operate as prods and brakes upon behavior, in some instances hastening an event and in others, delaying it" (Neugarten et al. 1965). In practice, these norms result in a prescriptive timetable of the correct ages for passing through life course transitions, and a social pressure toward individuals that are in advance or delayed in relation to this time. The social norms around the age of maternity (Billari et al. 2011; Goldberg 2014; Sevón 2005) are a clear example of this phenomenon. Age norms can be interpreted both in a sociological and a psychological perspective. In a sociological perspective, age norms are described within an (implicit) constructivist frame (Berger and Luckmann 1966) as the age norms are only marginally connected with biological exigencies (Luckmann and Schutz 1973). Once again, the norms around maternity provide a good example. Men and women are physically able to reproduce several years before the period when a pregnancy is socially "advised", i.e. after the entrance in the labor market (in western countries). Coherently with the constructivist frame, the individuals are conceptualized as unware of the age norms that are described to be perceived as a natural need (Neugarten, Moore, and Lowe 1965). In a psychological perspective, the age norms are connected with the development of ego and the managing of stress. Loevinger (1976) connects the adherence to normative time tables with an optimistic view on social trust and a conformist ego. This is a phase that should be overcome when the individual reaches an autonomous stage, in which norms are actively accepted or refused. Coherently with this view, some psychoanalytic theories connect the adherence (respectively the non-adherence) to prescriptive timetables to different types of resolution of an unconscious oedipal issue (Helson, Mitchell, and Moane 1984). At the contrary, another part of the psychological literature focuses on the role of stress (e.g. George 1993). Doubtlessly, life course transitions are powerful triggers for stress. When individuals adopt a behavior that breaks the norms about the timing of the transition, they add more stress coming from the adverse social pressure and stigmatizations processes. Consequently, every individual tends to avoid these situations and use the prescriptive timetables created by the age norms as references in the decision-making processes. This active use of socially prescriptive timetable, as an instrument for ordering individual life events and integrate individuals' lives in the social context, receives little attention in the literature that is much more focused on the normative side of the social clock. Nevertheless, this idea was already present in the first contributions on the subject (e.g. see Neugarten, Moore, and Lowe 1965). Obviously, the psychological and the

sociological approach are not opposed, but complementary, and explicit efforts to combine them are present in the literature (e.g. Helson et al. 1984), even if they had not a large diffusion. Despite the fact that the theory of age norms is quite dated, it passes the test of time. For example, the norms about family transitions (marriage, parenthood, grandparenthood) and career transitions (leaving school, retirement) were first defined in the sixties. Nevertheless, studies successive to the first contributions remain attached to this model even if they showed signs of de-standardization of the life courses, a differentiation across socio-demographic groups (Hogan and Astone 1986), and a progressive shift of the normative age of each life course transition toward an older age (Hogan 1981; Peterson 1996; Watkins, Menken, and Bongaarts 1987). Moreover, research crossings individual aging and long-term social change revealed that a desynchronization of individual life courses can be widespread and socially accepted among certain cohorts. A structural lag, in particular, can be an instrument to conciliate the boundaries of prescriptive timetables with other social and material needs (Riley, Johnson, and Foner 1972). Contemporary contributions on prescriptive time tables cover a multiplicity of issues from work careers (Karpinska, Henkens, and Schippers 2013; Lawrence 1996) to the entry in adulthood (Aassve, Arpino, and Billari 2013; Billari and Liefbroer 2007), from parenthood (Goldberg 2014; Mynarska 2007, 2010) to retirement (Radl 2012, 2013). On the empirical level, these contributions provide evidence of the influence of prescriptive time tables on individual life courses in new contexts and life course domains. On the theoretical level, recent contributions are in line with the general trend in life course analysis, i.e. combine different directions of study in a "holistic" view of life courses (George 1993; Pollock 2007). Svensson and colleagues (2015), for example, follow George's suggestion to pay more attention to the link between individual life courses and the surrounding social structures (George 1993). They associate the timing of life course transitions (notably retirement) with socio-demographic conditions and social, in particular family, structures. Similarly, other researchers (Liefbroer and Billari 2009; Settersten 2004) stress the importance to frame the analysis of the timing of life course transitions, as well as the entire analysis of demographic phenomena, in a deep analysis of social norms. In particular, the analysis has to be focused on all the dimensions of socially-defined age norms. The force of prescriptive elements has to be evaluated with reference to the corresponding social sanctions and expectations (Settersten 2004).

These recent developments show how the "principle of timing", as intended in contemporary life course studies, frames age norms in a larger theoretical and analytical perspective that stresses the importance of life course events, transitions and phases. In this thesis, a discussion about the age

norms is present in the first empirical study (chapter 2). In this study, we discuss the relevance of unemployment, a transition that is absent in many life courses, but, nevertheless, has strong age norms (Bigotta et al. 2011; OECD 2014). Our results confirm that a period of unemployment can be a stepping stone for some workers while a penalty for others (Schmelzer 2011). Age divisions, in particular, are highly relevant and appear connected both to general age norms and to the influence of the structure of Swiss social market (that is widely discussed in chapter 3).

The principle of "linked lives"

The last main pillar of the life course paradigm is the principle of linked lives. The definition of this principle is very straightforward as it states that individual lives influence and are influenced by the events in the life courses of family members, friends, and other people that are part of the social network. The study of the influence of social networks dates back at least to sociometry (Moreno 1934, 1951) and its developments from the analysis of small groups to the analysis of larger structures finally led to network analysis (Bott 1957; Clyde 1969; Phillip 1961; Stanley 1967). During the successive decades, many contributions have explored the mutual influence between individuals' life courses and the life courses of the people that lives in relation with them. They showed the links between social networks and individual identities (Coser 1975), the importance of networks in the definition of work careers (Ericksen, Yancey, and Ericksen 1979), and the importance of networks in the process of status formation (Lin, Ensel, and Vaughn 1981). Among these contributions, Granovetter theory on strong and weak ties (Granovetter 1973, 1983) created a turning point in network theory and became very influential on the successive literature. Granovetter approaches network analysis as an instrument to describe the link between the individual and the collective level. He distinguishes weak ties (acquaintances) from strong ties (family, friends). From an individual perspective, society is a clump of strong ties surrounded by weak ties. The people with whom the individual has strong ties probably know each other, consequently the weak ties become essential to have access to other groups. Weak ties provide opportunities and support individual's integration into larger communities (Granovetter 1973). Starting from these classic contributions, successive literature expanded in two complementary fields of study. On the one hand, researchers study the influence of networks on life courses showing how networks provide practical (Ali and Avison 1997; Silverstein et al. 2002) and psychological support (Greenfield and Marks 2006) to the individuals during life course transitions. On the other hand, many studies analyze how life course transitions

change the structure of individual networks. For example, Burton and colleagues (Burton and Bengtson 1985; Hagestad and Burton 1986) show how teenage parenthood has strong consequences on the life courses of parents and, even, grandparents. Similarly, many studies show how a divorce disrupts the links with in-law and, even, blood relatives with consequences on the long run (Kalmijn and Broese van Groenou 2005; Peletz 1995; Terhell, van Groenou, and van Tilburg 2004). The effects we have just described are not necessarily simultaneous to the life course events. Some researches observe long-term effects of individual networks. For example, parents' marital instability is connected to intergenerational relations during adulthood (Greenfield and Marks 2006; Swartz 2009). Similarly, Silverstein and colleagues find that a late leave of parents' home is connected with stronger family networks and a stronger support for ageing parents (Silverstein et al. 2002). With respect to the field of research of this thesis, there is a large literature on the application of the analysis of individual links on labor market studies (Ericksen et al. 1979; Flap and Boxman 2000; Granovetter 1973, 1995; Montgomery 1992). In particular, workers who can access a large network of weak ties are observed to receive job offers more frequently than who have limited networks and relies only on strong ties (Granovetter 1973, 1995; Montgomery 1992). Researchers confirm the validity of these relations for contemporary Swiss labor markets, the context of our analyses. Oesch and von Ow (2015) study the role of ties for jobseekers in the Swiss labor market. They confirm the general importance of individual ties but observe also differences between sectors of the population. Low-educated workers and immigrants are more likely to rely on informal contacts, but the differences are marginal. Nevertheless, the main distinction is given by the type of informal contacts. Workers with the most favorable employment prospects (male mid-aged university-trained high-earners) mainly rely on job-related contacts. At the contrary, South European immigrants and low-educated workers often turn to community-based contacts. This last result is supported by Amaro Galhano (2016) who describes the importance of nationality-based networks in the recruiting process of manual workers in the construction industry. Other researchers enlarge the perspective and stress that, in the Swiss context, informal contacts are important elements but need to be supported by an institutional frame (activation policies, unemployment centers) that valorizes individual networks (Bonoli 2014b; Bonoli et al. 2013; von Ow 2016). More generally, the bidirectional link between individual careers and networks (family, friends) has been widely observed (Le Goff and Levy 2016; Krüger and Levy 2001; Levy, Gauthier, and Widmer 2006; Madero-Cabib 2015). The majority of studies stresses that, in particular, family networks and their changes strongly interact with the evolution of individual careers. The interaction of these two elements can either result in advantages or disadvantages. This literature

stresses the importance to frame the mutual interaction of life course events in a more general conception of life courses, where a multiplicity of factors is involved, notably gender and other sociodemographic characteristics (Le Goff and Levy 2016; Krüger and Levy 2001; Levy et al. 2006). In this thesis, the relation of networks and work careers are explored mainly in the third analytical study (chapter 4). In this study, we focus our attention on the smallest possible network: couples. The principle of linked lives is the base for the analyses of the (possible) effects of maternity leave reform on men in our sample. Both the maternity leave reforms studied in chapter 4 (Swiss reform of 2005 and the Canadian reform of 2001) directly concern only women. The hypothesis that these reforms can have effects on the male component of the workforce is possible only if we suppose an indirect effect through the "liked lives" principle. The reform does not directly provide more or less opportunities to men in their careers, but has an effect as it changes the situation of a person that is part of the close network. This change in the network can have effects on men's life courses. Therefore, also men's careers can be affected by changes in a maternity leave reform, nevertheless, the double passage can reduce, amplify or change these effects. In chapter 4, we study these effects and we compare them to the direct effects of a maternity leave reform.

Beyond the five main principles of life course analysis: two minor principles

The five principles we have introduced in the previous sections of this chapter (life-span development, agency, time and place, timing, and linked lives) are largely accepted in the academic community (Mortimer and Shanahan 2004; Sapin et al. 2007). Aside from these principles, Mayer (2009) discusses the relevance of other constitutive elements of the life course approach. Mayer sums up the basics of the life course approach listing six elements that only partially overlap with the five principles we have listed in this chapter (life-long development, time-informed perspective, life course transitions across life domains, agency and structure, lives in collective contexts, and life course analysis as an instrument for preventive policies). A part from "life course analysis as an instrument for preventive policies" and "life course transitions across life domains", all the other elements can be brought back to the principles we have already discussed, even if some issues are mixed or separated. In the next two sections, we discuss these two further principles. We name them "minor principles" as there is less consensus on them, we made no statement on their validity. The anticipatory potential of life course analysis is a marginal element in our thesis. Surely, in the conclusion, we discuss the implications of our results for social policies. Nevertheless, in our analysis

we do not make explicit predictions of future developments of life courses. On the contrary, the importance of the study of life course transitions across life domains is a central element in our thesis, in particular, for the third analytical study (chapter 4).

A minor principle: life course analysis as an instrument for preventive policies

We start from the anticipatory potential of life course analysis as a basis for preventive social policies. This issue recalls the social science on the possibility to make forecasts. In sociology, the analysis is often inferential, i.e. it seeks to explain the relations and the trends. Rarely, sociology performs predictive analyses, i.e. it does not seek to forecast the results of trends and transitions. Since other perspectives come up beside classic positivism, predictions were put aside and became almost a taboo in social science (see Aldridge 1999 or Henshel 1982 for a discussion on the subject). Nevertheless, the strictly longitudinal dimension of life course analysis has pushed some researchers to investigate the possibility to extend the observed trends to unobserved (because future) time points (Du and Kamakura 2006; Frey, Ilic, and Xu 2015; Goldstein and Kenney 2001; Guzzo 2006; Yang 2009). As refers to life course analysis, Mayer states that, giving its longitudinal perspective, life course analysis has an "anticipatory potential" (Mayer 2009). In Mayer's intentions, this potential should be used to plan social policies based on the previsions of long-term trends. Consequently, social sciences researcher become active actors on the political arena either directly, suggesting social policies, or indirectly, with the promotion of scientifically informed policies. This conclusion rises a long-discussed, but never resolved issue about the legitimacy of political activism in social sciences. The implications of social research are not a recent issue (Merton 1973), and is highly controversial (see Kende 2016 or Lincoln 1995 for a discussion on this issue). On the one hand, some researchers (e.g. Choudry 2013; Lewis 2012) define themselves as "activist researchers" (see Choudry 2014 for an study on the positions of these researchers). On the other hand, other researchers states that "scientists should not just be activists, but people who can critically reflect on the limits of their objectivity, the objectivity that scientific analysis strives for" (Kende 2016: 407). Mayer's proposition (Mayer 2009) stands more or less in the middle and support a use of life course research that results in an instrument that anticipates tomorrow's changes and provides the empirical bases for social policies. Forecasting can be done also from a politically neutral position. Apart from the debate about the connection between politics and social sciences, this principle introduces the discussion on the evolution of future trends.

A minor principle: life course transitions across life domains

The second minor principle states that life course transitions have to be studied across life domains. The definition of life course domains is necessarily vague because it is based more on research needs that on real-life distinctions. Individuals have multiple roles at the same time. They can be spouses, patients, unemployed, and inhabitants of a small town, all at the same time. These roles are individual but refer to common dimensions of social life such as family, employment, or health. When referred to individual life courses, these dimensions are called life course domains. The principle that states that life course transitions have to be studied across life domains is largely accepted in life course research. Nevertheless, empirical analysis is lacking to give conclusive results on the characteristics of a general connection among life domains. At the theoretical level, this principle follows the same logic as the one of "linked lives" principle. The basic idea is that individual resources (time, money, physical and psychological energies) are limited, and life course events are either resource-consuming or resource-providing. Consequently, when the individuals focus their resources on a particular life course transition, this goes to the detriment of other life course domains. Similarly, when a life course transition in one domain provides new resources, they can be used in other life course domains. This transmission (or conversion) of resources, that in the "linked lives" principle is applied to a network, is here applied to different life course domains of the same individual. The epistemological model behind both these principles is a holistic view of social sciences (Phillips 1976; Pollock 2007; Svensson et al. 2015). According to this perspective, "a part cannot be understood in isolation from the whole" (Phillips 1976: 3). A "part" can be either an individual, like it was intended in the classic holistic theory (e.g. Durkheim 1894), or a life course domain, if we consider the individual as the "whole". These relations are also sometimes called "spill-over" (among life course domains) and "cross-over" (among people) effects (Bolger et al. 1989; Totenhagen et al. 2016). At the empirical level, a number of empirical contributions has measured the effects of a life course turning point on other life course domains. Most of the studies connect two life course domains. Even limiting our view to recent contributions, we can find numerous examples. Davia and Legazpe (2014) connect employment trajectories with family formation (marriage and childbirth). Their results show a connection between these two life course domains, even if they do not frame this relation in a precise theoretical interpretation. Gauthier and colleagues (2010) study the relation between household residential arrangements and employment trajectories, included education. Their paper is mainly

methodological, but they find a clear association between the patterns in these life course domains. McMunn and colleagues (2015) ask a very similar research question, and connect employment and family patterns within a gender perspective. The authors find evidence of a growing divergence of patterns across cohorts, for both employment and family patterns. This is observed for both women and men, even if employment patterns involving part-time employment or a career break remain common for women, even in the most recent cohorts. The same life course domains (employment and family) are studied by Oesterle and colleagues (2010) who restrain their attention to men and women entering adulthood (18-30 years). They find that marriage and family formation are still relevant events in the transition to adulthood with a strong differentiation between men and women. Few research combines more than two life course domains. Among them, Bolger and colleagues (1989) connect work dynamics, health (stress dynamics), and family lives. The combined study of different life course domain reveals relations that, sometime, goes against previous findings showing the importance of a holistic conception of life courses. For example, men are observed to be more prone to transfer the stress between work and family environments. Similarly, Pollock in his "holistic trajectories" (Pollock 2007) connects employment, housing and family careers. His results reveal the centrality of the housing trajectories that appear to be determinant for all the other life course domains. Very recently, Bernardi and colleagues (2016, 2017) propose a strong advancement in the conceptualisation of the mutual influence of life course domains including personality psychology. They study how becoming parent produce a lasting change in well-being in work and leisure, life domains that are strongly connected with family dinamics. The authors observe systematic changes in well-being across the life course domains and, starting from their empirical evidences, claim the necessity for a further attention to these relations. In addition, the researchers opens new paths of research refeering to the longitudinal dimension of the the relations among life course domains ("longer-term spillover effects"), and the role of individual psychological traits.

Despite these relevant contributions, analyses that combine three or more life course domains remain rather rare. This is mainly due to the lack of data, and the complexity of their analysis, also, on the methodological level. Statistical models that consider multiple life course domains are rather recent (e.g. Andersen and Keiding 2002; Bijwaard 2014; Gauthier et al. 2008) and, to some extent, still under development. Nevertheless, more and more research is conducted in this direction and, probably, "life course transitions across life domains" will become a new fully-recognised principle of life course analysis.

In this thesis, the analysis of life course transitions across life domains is largerly present in the second ant the third empirical studies (chapters 3 and 4). In the second part of chapter three, we discuss how the socio-economic context influence a process that involves two life course domains: employment and housing, in particular, the region of residence. In our results, we show how a change in the employment domain (finding a new job in an attractive area) can have an effect on another life course domain (the region of residece and all the changes in indivdidual networks it implies). In chapter four, we study the effects of a change in the family settings on employment careers. Our results clearly show how careers change in a period shortly before and after a childbirth. We observe different types of changes depending on individual caracteristics, childbirth order, and contextual elements. Coherently with previous studies (Gauthier et al. 2010; McMunn et al. 2015; Pollock 2007), our results stress that the relations between life course domains are complex and have to be integrated in a larger study of the life courses. These results contributed to the analysis of simultaneous inflences among life courses (spill-over effects) and delayed influences among life courses (lag spill-over effects) a field of study that needs further research to be fully understood.

1.4 A further concept: turning point in life course analysis

The idea that discontinuities in individual lives patterns play an important role in the analysis of life courses is widespread in many disciplines. These discontinuities take different names depending on the approach used to study them. For example, microeconomics speaks about “shocks” (Lucas 1977) and social history uses the term “turns” (Sewell 1990). In life course analysis, the most widely used concept is “turning point”. This concept has a long story in the life course theory and derives from the longitudinal analysis of labor markets. Already in the fifties, Hughes (1950) explicitly speaks of “turning points” referring to discontinuities in individual work careers. Nevertheless, only with the rise of the life course perspective, turning points are integrated in a systemic description of individual lives (Elder 1985). For a definition of turning point, we can follow Abbott and define the turning points as “short, consequential shifts that redirect a process” (Abbott, 2001: 258). This definition synthetizes previous contributions (e.g. Elder 1985; Hareven and Masaoka 1988) and it is often discussed in contemporary life course analysis (Grossetti 2006; Hackstaff, Kupferberg, and Négroni 2012). Firstly, this definition states that a life course turning point is “short”. This does not mean that it is an isolated event. As every component of a life course, a turning point is part of a long-term process (Abbott 2009; Hareven and Masaoka 1988). Nevertheless, during a turning point, this process

accelerates abruptly and takes a new direction. Even if it is impossible to establish the maximum length of a process to be a turning point, we can follow Abbott (2009) and state that the individuals must perceive it as instantaneous, or very limited in time. A marriage, for example, is considered as an instantaneous passage from two states: single to married. Nevertheless, from a more sociological perspective, it is clear that the ceremony is the result of a long preparation, both at the personal and at a social level (almost all the cultures require passages that involve a social acceptance of the couple). Consequently, when it comes to the analysis, the researcher must be aware that a life course turning point is not an isolated event, but part of a process (Hareven and Masaoka 1988), even if it is perceived differently (Abbott 2009). Secondly, Abbot's definition states that the turning point must divide two clearly distinguishable periods and must be the cause of this division. Consequently, even if some major life course events can be always considered turning points, strictly speaking, a turning point can be defined only a-posteriori. Here, a major distinction arises in the literature. For some researchers (e.g. Abbott 2009), only the experts can define the periods before and after the turning point. On the contrary, other researchers (e.g. Hareven and Masaoka 1988) put the individual self-reflection at the center of the attention. This last theoretical position focuses on the narrative aspect of life courses, but it is prone to the limitations of individual reinterpretation and (a-posteriori) rationalization (Abbott 2009). For the individual, the knowledge of the possible options, and the costs and the advantages of each solution are rarely clearly identifiable, both during and after the turning point. In addition, the pathway taken during life course transitions can be influenced by routines, traditions, and other limits of the goal-oriented rationality (Becker and Murphy 2000; Etzioni 1988; Leibenstein 1981; Micheli 2010), and individual agency can be limited by the surrounding social context (Abbott 2009; Diewald 2001; Elder 1997; Furstenberg 2005; Settersten and Gannon 2005). Members of the individual's network, cultural schemes, and social policies can act as mediators. On the one hand, they act as examples for the individuals that are facing the turning point, on the other, they provide support for the eventual negative outcomes or increase the positive outcomes (Billari and Liefbroer 2007; Fishbein and Ajzen 1975; Furstenberg 2005). Abbott, in particular, discusses the presence of cultural schemas and the limitation of individual agency with the concept of "convergent turning points" (Abbott 2009: 197). This concept generalizes the observations of Sampson and Laub (1993) on criminal careers, and states that, in presence of life course turning points, many individuals take directions that bring them in a similar, if not identical, situation. This convergence reveal the presence of a common element that influence all the individual life courses. Abbott (2009) identifies it in the social and cultural context.

Despite its vast use, the concept of turning point as a "short, consequential shifts that redirect a process" (Abbott, 2001: 258), is not the only alternative to the study of life transitions inside a life course perspective. Furstenberg (2005), for example, suggest that some turning points differ from others as they violate a socially defined time schedule, i.e. the prescriptive order and the timing of life course transitions (Neugarten et al. 1965). The author calls these events "non-normative life-course transitions" and suggest that they have life-long consequences, especially if experienced during youth. Another, more explicit critic to the concept of turning point comes from Grossetti (2006). For Grossetti, the concept of turning point is too large and fuzzy, and does not distinguish between individuals with different resources and necessities. The author suggests to focus the attention on an alternative concept developed in the last decade by Grossetti, Bidart, and Bessin and called "bifurcations" (Bessin, Bidart, and Grossetti 2010; Bidart 2006; Grossetti 2006), i.e. critical life course events that are strictly irreversible and unpredictable. Similarly to what happens with turning points, the same event can be a bifurcation or not depending on the timing of the event in the life course, and individuals' resources. Consequently, social scientists have to be more attentive to individual situations, in particular to the individual ability to predict the result of a change in the life course. This element assumes a particular relevance in contemporary societies that are described as largely featured by incertitude (Giddens 1990; Grossetti 2006). Given their characteristics, these two concepts (non-normative life-course transitions and life bifurcations) are often seen as specific case of turning points more than a general alternative. Also for this reason, in this thesis, we approach the study of life-course transitions using the concept of turning point as intended by Abbott and presented in the previous paragraphs, i.e. an event with a short duration that is the cause of the division between two clearly identifiable periods in a life course (Abbott 2001, 2009). This concept is large enough to include in a common interpretative frame life course transitions, such as a period of unemployment or a childbirth (the transitions analyzed in chapter 2 and 4, respectively), that are not necessary a violation of socially-defined timetables, or the cause of unpredictable events. In the first empirical study (chapter 2), we focus our attention on the period after the transition (the first month of unemployment). Nevertheless, coherently with the definition given by Abbott (2001), we compare the period after the transition with the period before it, in order to show the discontinuity brought by the life course turning point. In addition, even if we do not completely adhere to all Grossetti's (2006) positions, we agree with his suggestion to integrate individual characteristics in order to differentiate the analysis of life course turning points. Consequently, we adopt a multidimensional measure of the consequences of unemployment and we discuss our results according to both the force and the type

of the effect. This operation is meant to analyze an identical (or, at least, similar) turning point as a set of individual experiences that have a different impact on life courses depending on individual characteristics. In chapter 4, we explore another dimension of life course turning points, i.e. the individual strategies and the influence of the context on them. Again, we adopt Abbott's (2009) perspective and we consider that individual agency during a life course transition is limited by contextual factors. In our analyses, we compare the period before and after a maternity leave reform to explore the influence of the cultural and political context on individual life-course strategies.

1.5 New developments in life course analysis and the contribution of this thesis

In the sections above, we have introduced the current state of the art of life course research. In recent years, many efforts were made to create a consistent body of literature that define the life course approach (Alwin 2012; Levy and Bühlmann 2016; Mortimer and Shanahan 2004). This work was largely successful and life course research is now an established field of study. Nevertheless, life course research is still largely an explorative field of research that tends to cumulate new results without a proper systematization (Alwin 2012; Mayer 2009). The lack of organization of the results is a structural problem in social sciences, in particular in sociology. The five principles we have described in the previous sections of this chapter (life-span development, agency, time and place, timing, linked lives) are widely accepted. Nevertheless, many elements remain unclear and need further research (Alwin 2012; Levy and Bühlmann 2016; Mortimer and Shanahan 2004). Some authors discuss specific topics that need further attention in life course research. The issues under discussion are multiple and vary from the changes of life courses in late modernity (Dannefer 2003b; O'Rand 2003; Weymann 2003) to the role of the individual in the analysis of life courses (Abbott 2009), from the relations to demography (Hogan and Goldscheider 2003) to the heterogeneity of life courses on socio-demographic divisions (Furstenberg 2003a; George 2003). Other authors discuss the foundations of the life-course approach from a more general point of view. Mayer (2009) stresses the lack of a largely accepted theory of action. Unlike in other disciplines, such as economics with the investment/return theory (Behrman 2003; Bonneuila and Saint-Pierrec 2008), researchers in life course studies do not champion a single time-informed theory of action. In Mayer's view, researchers need a common theory of action that strives to be a common background to the analysis of life courses. This theory "needs to answer satisfactorily the question of what kind of mechanisms operate to relate early conditions in life to later outcomes" (Mayer 2009: 13), and support an approach to life course

analysis that should evolve from the simple analysis of sequences of transition and states and "focuses on the concept of risk" (Mayer 2009: 13). Another critique is addressed by Alwin (2012) who retraces the history of the life-course approach and its relations with developmental psychology and demography, to observe that the contemporary concept of life-course becomes a fuzzy notion that covers a wide set of terms, including "life span" and "life cycle". Alwin suggests that a more precise definition of the differences among these terms would contribute to the creation of a more robust theoretical frame and, finally, a better understanding of individual life courses. Consequently, he proposes a "general developmental framework that includes historical and biographical time, incorporating *within-person change* (i.e. human development and/or aging), *life cycle stages*, and *life course events, transitions and trajectories* across the *life span*" (Alwin 2012: 23-24, emphases in the original text). A further and more ambitious dissertation of the life-course paradigm is provided by Levy and Bühlmann (2016). Starting from the recent advancements in life-course literature, the authors revise the five basic principles of the life-course paradigm and aim to update them. The core of the five principles remain, but further elements are integrated or specified. For example, migration backgrounds are introduced ex-novo as an element that redefines the principle of "time and space", while an already present element, the "life-span development", is reinterpreted, using the cumulative advantage/disadvantage theory (Dannefer 2003b) as "life-course cumulation". In general terms, the authors ask for a greater attention to the role of social and institutional elements in the definition of individual life courses. Life courses have to be considered "as a movement through social space" (Levy and Bühlmann 2016: 40).

In this last section of the theoretical chapter, we start from these recent contributions, and the theoretical background previously introduced, to discuss three issues of the life-course theory to which this thesis wants to make a contribution. These issues cover three areas of study that are currently debated in life course, i.e. (a) the model of human action that stays behind life course research, (b) the problem of heterogeneity of life courses, (c) the longitudinal relations in the life courses (in particular the integration of turning points as process, and the role of expectations and social inertia). These issues will be revisited in the conclusion, where, with the support of the results from the empirical chapters, we show the theoretical contributions of this thesis to the life course literature.

A model of human action

As we have discussed in section 3 of this chapter and, briefly, in the previous paragraph, the researchers working inside the life course paradigm do not share a common theory of action (Mayer 2009). Most of the researchers apply a perspective that stands between the two extremes of a continuum that, following Goldthorpe (2001), goes from "rational action theory" to "norm-oriented action theory". Nevertheless, many empirical studies rely on a sort of "theoretical individualism". They have the tendency to privilege the analysis of life-courses as a phenomenon driven by individual agency to the detriment of the importance of the social context (Levy and Bühlmann 2016). At the empirical level, the social dimension is sometimes reduced to the analysis of "personal attributes" (e.g. age, sex), "social address" models (e.g. social class, ethnic group), and "social niche" models (poor, young, versus other groups) (Settersten and Gannon 2005). Using a vaguely constructivist framework (Berger and Luckmann 1966), many researchers consider these elements as social constructions. Consequently, the social context influences individual life courses mainly due to the collective interpretations of individual conditions. Social norms and prescriptions have, thus, only indirect impact on individual life courses, and are always mediated by the people who are included in individual networks (Settersten and Gannon 2005). Some researchers support an individual-based analysis of life courses and suggest that this attention to the individual dimension should be better structured around a more complete definition of individual agency (Billari and Liefbroer 2007; Gecas 2003). Others support a theoretical shift toward a more important role of social structures (Levy and Bühlmann 2016; Settersten and Gannon 2005).

In this thesis, we adopt a position in line with Settersten and Gannon's concept of "agency within a structure" (Settersten and Gannon 2005: 41). Nevertheless, we consider the role of the social contexts more relevant than these two authors. We endorse the effect of individual networks in the enforcement of social norms and proscriptive models, nevertheless we also assume a "direct effect" of the context. This direct effect includes both the influence of norms, values and models consequent to the process of socialization (Berger and Luckmann 1966), and the changes in the life courses brought by historical circumstances (Elder and Kirkpatrick Johnson 2002). Peoples' agency is a major element in the development of individual life courses, but it is not all-powerful as it remains "within the opportunities and constraints of history and social circumstances" (Elder and Kirkpatrick Johnson 2002). This frame allows the presence of a variety of individual strategies. Goal-oriented approaches to life course turning points (Goldthorpe 1998) can coexist and mix with more norm-oriented

strategies as the "routine" behaviors, i.e. cultural-driven behaviors that can differ from an individual goal-oriented rationality (Leibenstein 1981). Moreover, collective events, such a political reform, can have a direct influence on the adopted strategies because, on the one hand they change the cultural references, and, on the other, they impact on the costs and the benefits of any individual strategy. All these elements are considered and, when possible, analyzed in the three analytical studies of this thesis (chapters two, three, and four).

The problem of heterogeneity of life courses

Many researchers stress the problem of the heterogeneity of life courses and the consequent difficulty to find large-range theories (Furstenberg 2003a; George 2003; O'Rand 2003). This heterogeneity is due to socio-demographic factors, such as gender, ethnicity, and social class and gender (Furstenberg 2003a). These divisions of the population are considered among the main factors driving the differentiation of the life courses. *Ethnicity*, is almost completely unexplored in this thesis. Our data are lacking the information to properly handle this information. Only in the first empirical study (chapter 2), we discuss the differences between Swiss and foreign citizens when it comes to a period of unemployment. As expected, the results are consistent with a heterogeneous population and suggest further analyses. Our sample is too small to allow this operation, consequently we do not discuss these differences further, neither in the chapter nor in the conclusion. A similar situation prevails when it comes to the analysis of *social class*. Our data allow only for a marginal discussion of class dynamics. Job positions are often used to create class-based typologies (e.g. see Erikson and Goldthorpe 1992; Erikson, Goldthorpe, and Portocarero 1979 or Oesch 2003, 2006, for Switzerland). Nevertheless, the connection among this element and social class is debated, and other indicators are presented as alternatives. Consequently, given the limitation of our data, we prefer to do a different analysis referring exclusively to job positions and family background (parents' education level). These indicators are used to discuss individual socio-economic statuses and the resulting resources or constrains. In the first empirical study (chapter 2), in particular, we analyze these differences. The attention is focused both on groups that are usually considered vulnerable (low-educated workers or people with modest social origins), and on groups that are usually considered advantaged (workers highly educated or in very prestigious jobs). As refers to the description of *gender* divides, our analyses are more precise. We analyze the gendered nature of life courses, in particular, work careers, in all the analytical studies (chapters two, three and four). A strong difference between men's and

women's careers is observed in numerous countries, including Switzerland (Goebel and Ehrensperger 2009; Le Goff and Levy 2016; Widmer et al. 2003). Our data confirm these differences and, in chapter 5, we add some elements that can reveal the rising of new trends. These cues are summed up and commented on in the conclusion.

In addition to the just described contributions, we introduce an element in our analyses that is rarely approached. The issue of heterogeneity in the life courses is often approached discussing the differences among social groups in the incidence or in the strength of certain phenomenon. Together with this type of analysis we describe if and how being part of a specific social group increase the likelihood to be affected by certain phenomena to the detriment of others. Specifically, in chapter 2, we discuss how different social groups suffer from different negative effects of a period of unemployment, and, to a less extend, in chapter 4 we discuss how men and women have a different career around a childbirth. Discussing the differences in the type of social phenomena that involve different groups of the population, provide a more detailed view on life course heterogeneity. Instead of a one-dimensional description, where people are spaced-out but on the same path, we provide a multidimensional analysis where different evolutions of the life courses appear.

Longitudinal relations in life courses

A third issue in life course analysis is the description of longitudinal relations and their contribution to the study of causal relations. The role of causal relations is debated. Some authors claim the primacy of causal links (Goldthorpe 2000), others claim a larger role of other approaches, notably descriptive (Abbott 2001). On an empirical level, the definition of a causal link and the difference between it and a simple correlation is debated. Some researchers suggest statistical methods to establish the causal relation (e.g. Bollen 2012; Di Prete and Gangl 2004). Others states that the main difference between a causal link and a correlation is the theoretical interpretation of the link, a result that can be achieved only through theory (Goldthorpe 2016). Independently from the discussion about the empirical possibility to describe a causal relation, we can describe three theoretical conditions that, in quantitative sociology, define a causal link (Oppewal 2010):

1. covariation,
2. control for "third variables",
3. temporal precedence.

Covariation is the simplest and most basic condition for causality. Causally, an "effect" depends on a "cause" if, and only if, (a) the "cause" had occurred, then the "effect" would have occurred, and (b) if the "cause" had not occurred, then the "effect" would not have occurred (Lewis 1973). The control for "third variables" adds a specification to the aforementioned covariation. The covariation between the cause and the effect needs to be a net covariance. Any effect generated by any other variable needs to be excluded (or controlled). Finally, the principle of the temporal precedence imposes that the cause preexists to the effect.

All these principles are very solid, but reveal some problematic issues when applied to life course analysis. The two main problems are connected to the longitudinal dimension of the life courses: the role of expectations, and the presence of social inertia.

In the analysis of life courses, researchers sometime observe phenomena that seem to violate the principle of the temporal precedence. The effects sometime seem to precede the causes. For example, Bernardi and colleagues studied the relation between childbirth and life satisfaction, and observed that "changes in life satisfaction occur already before the event [i.e. childbirth]" (Bernardi et al. 2016: 27). This apparent inversion in the temporality between causes and effects can be interpreted using the concept of expectations. Individuals have expectations that preexist the life course turning point, and act in accordance to these expectations. The study of expectations has a long tradition in social sciences. Luckmann and Schutz (1973) consider the expectations of future conditions as the main determinants of human actions, together with the experience of past conditions. Merton (1984) generalizes these results and indicates the expectations of the duration of future events as main predictors. Starting from previous experiences and observing the life courses of the people around them, individuals make previsions on the consequences of future turning points in their life courses. The comparison with others introduces a social influence in the formation of the expectations and, thus constitute a normative element. Expectations are described as socially built. Consequently, on the empirical level, we can use cultural models as a proxy of individual expectations if we do not have this information. Using this assumption, a behavior that is recorded before what seems to be its apparent cause can, therefore, be reconducted to a cultural model and explained with the pre-existence of (unobserved) expectations. This relation would be only a speculation and would need further research to be confirmed. Nevertheless, the use of expectations can be a conceptual instrument to explain behaviors that seems to find a cause in future life course turning points.

The second concept that arises from life course analysis and (apparently) contrasts with a traditional model of causality is *social inertia*. The term of social inertia is used in sociological literature with

slightly different meanings (e.g. see Hannan and Freeman 1984; Ramasco and Morris 2006; Zantvoort 2015). The creation of this term is sometime traced back to Bourdieu's "hysteresis effect", i.e. the lack of adaption of individual models of behavior to a changing social context (Bourdieu 1977, 1985; Walther 2014). Without entering in the Bourdieu's complex interpretative frame, our definition of social inertia goes back to the origin of the concept in physics, from where it was translated in the social sciences. The principle of inertia derives from Newton's laws on motion (Newton 1687) and states that *"unless acted upon by a net unbalanced force, an object will maintain a constant velocity"*. Inertia is the ability to maintain its status (motion of stillness), in absence of external forces. Translated in social sciences, inertia can be defined as the ability to maintain its status (social position, habits or others), in absence of external (social) forces. As we have discussed in the paragraph dedicated to the principle of "life-span development", in life courses studies, social inertia is a well-known phenomenon, sometime called (with a statistical terminology), path dependency (Nelson and Winter 1982). The presence of social inertia is in conflict with the condition of the "covariation". In presence of a cause, part of the sample co-varies. At the same time, an unobserved force (the social inertia) acts against the cause and keeps another part of sample in the previous position. All the events that can be explained only with the presence of social inertia are effects without a cause. There are two ways to overcome this apparent incoherence. Either we consider the simple existence of previous existing statuses as possible causes for the observed statuses, or we conceive the casual link under a probabilistic frame. The probabilistic version of the first condition of causality states that the variations in the cause increases the likelihood to observe a (co)variation in the effect. If we apply this frame to a sample of empirical observations, some of them would (co)vary while others would not. Using this perspective, we bring back inertia in a causal model, and we can even use it to "measure" the strength of a change (e.g. a life course transition). As we have discussed at the beginning of this chapter (section 2), this approach is widely used in contemporary quantitative sociology (Goldthorpe 2016). The concept of social inertia shows how, for longitudinal analysis, this is not a simple methodological choice, but a necessity.

Both expectations and social inertia do not invalidate the possibility to have a causal model. However, they bring new (longitudinal) elements to the main model used in quantitative sociology. Further empirical research is needed to understand the actual relevance of both expectations and social inertia in life courses. The empirical chapters of this thesis are a step in this direction. In particular, the third empirical study (chapter 4), provides some results that can be using both expectations and social inertia. These elements are briefly presented in this chapter, and discussed in the conclusion.

The models of human action, the heterogeneity of life courses, the role of expectations and social inertia, and the use of comparisons are issues largely discussed in contemporary life-course analysis (Alwin 2012; Goldthorpe 2016; Levy and Bühlmann 2016; Mortimer and Shanahan 2004). We have introduced all these elements in this last section of the theoretical chapter as they are directly related with the analyses reported in the following chapters. The discussion of these macro theoretical arguments finds little space in the empirical chapters that are more focused on specific results. Only in the conclusion, we discuss again these concepts in relation with the empirical analyses showed in the next chapters, and we present the contribution of this thesis as well as the questions that arise from our results.

CHAPTER 2

Towards a multi-dimensional analysis of unemployment scarring

with
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2.1 Introduction

The aftermath of the economic crisis in 2008 made it cruelly clear that being in employment remains crucial to one's social reputation, identity, and standard of living in most Western societies (Krause 2010). Inversely, unemployment is a life-course hazard that casts a shadow over most of the core aspects of modern life (Arulampalam 2000; Cappellari and Jenkins 2008; Djurdjevic 2003). Unemployment leads to poverty (Vandecasteele 2010), generates anxiety and depression (Oesch and Lipps 2012), causes health problems (McKee-Ryan et al. 2005), and leads to family crises (Engelhardt 2010). These risks are not limited to the period of unemployment, but leave long-term scars (Arulampalam 2000; Gangl 2006). However, the literature on the negative consequences of unemployment has mostly concentrated on wage loss and has struggled to address alternative, dynamic forms of scarring.

The aim of this study is to study these scars inflicted by unemployment in a novel, multi-dimensional way that goes beyond the study of wage effects. Three different forms of unemployment scarring will be investigated: long-term unemployment, occupational downgrading and career instability. We describe these forms of scarring, examine the influence that socio-demographic factors have on them, and study the relations among them. What is more, instead of considering unemployment just as the opposite of employment, we conceptualize a period of unemployment as part of an individual employment trajectory linked both to the past and future developments of the individual career. The article is organized as follows: we first present recent theories of unemployment scarring and discuss how they can be applied innovatively to the Swiss case. Following our research hypotheses, we present the data and methodology and discuss our results: in section four, we describe unemployment trajectories and, in section five, we propose different explications for the three forms of scarring. The article is rounded off with a conclusive discussion.

2.2 Theories of unemployment scarring

The concept of unemployment scarring states that a period of unemployment creates negatives effects on the subsequent career, leaving a "scar." The negative effect was initially observed in economic studies of the 1990s and early 2000s and was found to create a wage penalty (Arulampalam 2000; Arulampalam et al. 2001; Narendranathan and Elias 1993). The scarring effect seems to be persistent over time (Arulampalam 2000) and is particularly penalizing for workers in early career stages

(Luijkx and Wolbers 2009). While state dependency is almost unanimously accepted (see Narendranathan and Elias 1993 for an exception), the elements leading to long-term effects have been debated. Some authors stress the importance of unemployment duration over unemployment frequency (Luijkx and Wolbers 2009), while others posit the opposite (Arulampalam 2000). Even if social policies proved to be effective against it (Gangl 2006), the mere presence of unemployment scarring effect seems to be independent of the institutional context as it is observed in different welfare regimes. Starting from this specific economic concept, recent literature developed three main axes of research: the variation of the scarring effect among different sectors of the population, and the redefinition of the concept of scarring. The first axis of research refers to the variation of the scarring effect among different sectors of the population. Both international (Arulampalam 2000; Luijkx and Wolbers 2009; Mooi-Reci and Ganzeboom 2015) and Swiss literature (AMOSA 2007a; Bigotta et al. 2011; SECO 2015) stress that certain groups of the population (e.g. women, old workers, or poorly educated people) suffer more extensively from the negative consequences of a period of unemployment or are concerned by specific types of scarring. The second axis of research focus on the measure of the longitudinal effects of unemployment scarring. Most of the studies examine scars by comparing two (or sometimes three) moments in time (e.g. Brandt and Hank 2014; Cappellari and Jenkins 2008; Gangl 2006; Stewart 2007). The implicit hypothesis with this kind of measurement is that unemployment periods are relatively stable and can be measured by one single point in time. We know, however, that the phase of immediate post-unemployment is prone to the risk of instability and fluctuation (Cappellari and Jenkins 2008; Djurdjevic 2003; Manzoni and Mooi-Reci 2011; Stewart 2007). Consequently, an approach based on detailed longitudinal measures, e.g. employment sequences (Heylen 2011), is slowly rising. The third axis of research is, probably, the most radical, and focuses on the definition of unemployment scarring. The economic definition of scarring is still largely used, both within and outside economic literature (Gangl 2006; Oesch and Baumann 2015). Wage is a so-called objective variable that is available in many large surveys and, because of its continuous character, has certain advantages for empirical analysis. Nevertheless, even if wage loss is a reasonable proxy for scarring, many researches showed that it is not the only relevant indicator and should be complemented with other measures (Brand 2006; Clark et al. 2001; Dieckhoff 2011; Knabe and Rätzel 2008; Luijkx and Wolbers 2009). Wage is a symptom that, as every symptom, can hide different phenomena. In current literature, the concept of unemployment scarring still describe a negative consequence of unemployment, but it now includes a wide set of effects, like the difficulty of finding a new job (Luijkx and Wolbers 2009), emotional repercussions (Clark et al. 2001), job

quality (Brand 2006), job satisfaction (Dieckhoff 2011), or the stability of future perspectives (Knabe and Rätzel 2008). These "non-monetary" aspects of job quality (Dieckhoff 2011) can be related to wage penalties but can also be separate effects that are now an established subject of study.
In this study, we bring a contribution to the just introduced debate using a multi-dimensional and sequential approach to unemployment scarring that presents the months after the first month of unemployment as a single period (and not a group of phases) in which unemployment scarring differs, both for intensity and type, depending from workers' characteristics.

A multi-dimensional and sequential approach to unemployment scarring

Against an exclusive concentration on a simple and narrow theory of wage penalties, we conceptualize unemployment scarring as a dynamic and diverse phenomenon. We seek to examine unemployment longitudinally, as whole trajectories, including re-entries into the labor market, returns to unemployment, and the mobility between different occupational categories. As these spells of fluctuating employment are often short, we think that a phase of "post-unemployment" is frequently also a period of "pre-unemployment." In other words, we deem it necessary not only to concentrate on post-unemployment careers, but also to examine trajectories from the first moment of unemployment onward and to analyze the duration and re-occurrence of unemployment as well as (and in relation to) a "post-unemployment" phase in a narrow sense. Moreover, we seek to study scarring in multiple forms that go beyond wage loss: as long-term unemployment, occupational downgrading, and career instability. We speak of long-term unemployment when a first spell of unemployment leads to repeated redundancies and long periods of joblessness. In both of these cases, unemployment is, by far, the most presented status in the period after the first transition in unemployment. In other cases, in order to escape from unemployment, individuals might be forced to be - or voluntarily accept becoming - downgraded. We define occupational downgrading as a decline in terms of occupational category after a spell of unemployment (Aisenbrey, Evertsson, and Grunow 2009). A third form of unemployment scarring is what we call career instability. In this case, workers find new employment, but the first phase after re-entry in the labor market is more turbulent and characterized by frequent changes in order to find a new suitable position (Djurdjevic 2003; Manzoni and Mooi-Reci 2011). Whether individuals follow one of these options depends on their resources, but also on the options structurally available to them. We presume that different forms of scarring are related, and that their effects are dependent on each other. These three forms of

unemployment scarring are alternative possibilities with no hierarchical structure. No consequence of unemployment is more severe than the others; they are simply different outputs. We consider that these three forms of unemployment scarring provide a good representation of the possible consequences of unemployment; nevertheless, we are aware that they are not the only possible ones. The effects of unemployment can be numerous and not necessarily negative. In this study, we focus only on the negative effects of unemployment and on people that do not exit definitively from the labor market. Consequently, we do not consider workers that have a positive outcome after the period of unemployment, a sort of "positive scarring", or people that retired or ended up in other forms of inactivity. The reasons for this choice are so that we can maintain a certain uniformity of our analyses. The introduction of positive outcomes would bring our discussion to a different level that is related, but different, from what the literature considers as scarring. Similarly, people that definitely quit the labor market cannot have a scar on their career as their job-related employment sequence is interrupted. All the other workers, including those who fall under long-term unemployment, remain inside the labor market and long-term consequences of unemployment can be observed. Contrarily, people in inactivity follow another route that is not affected from labor market dynamics. Following the same logic, we consider only the effects that can be described considering the employment sequences that are composed only by the presence and the type of job. Other measures (e.g. part-time/full-time or the length of the contract) would bring a form of scarring that is hard to compare, and sometimes overlaps, with the three measures we have introduced (long-term unemployment, occupational downgrading, career instability). Consequently, even if we acknowledge their effectiveness in the study of unemployment scarring, we do not include them in our analyses.

The Swiss socio-economic context

Scarring effects vary according to the institutional regime and the unemployment rate of a country (Gangl 2006; Knabe and Rätzel 2008). There are good reasons to hypothesize that these factors influence the dynamic of unemployment trajectories and the types of scarring which are prevalent in a country. The present study is based on the Swiss case, a context with a relatively low unemployment rate and a high signaling effect of unemployment. Until the early 1990s, unemployment in post-war Switzerland was very low. A large migrant workforce and women were used as labor market buffers in times of crisis (Flückiger et al. 2006; Gerfin and Lechner 2002; Giugni, Berclaz, and Fuglister 2014). It was only in the early 1990s that the unemployment rate began to rise, from 1.9% in 1991 to

4.2% in 1997. During the 2000s, it fluctuated between 2.7% (2000) and 4.5% (2010), but never again dropped below the pre-1990s level (Gerfin and Lechner 2002).

Like Germany, Austria, and Denmark, Switzerland has a dual education system that tightly links vocational training (which is the option chosen by more than 60% of Swiss youths) and occupational placement in the labor market. In addition, and in contrast to Germany, for example, Swiss employment protection legislation is frugal and allows for easy individual lay off with notice periods of dismissal of one month (during the first year of tenure), two months (during 1 to 9 years of tenure), or three months (after 10 years). Workers with long tenure are not significantly better protected than new arrivals in the firm. We can therefore speak of a relatively low hierarchy of protection among different groups of employees. Complementary, unemployment insurance is relatively generous, even though it has been toughened and transformed according to principles of active labor-market policy in recent years (Bonoli 2010). If employees have contributed to the insurance scheme for at least 18 months, they are entitled to at least 70% (or 80% for low-wage earners and parents) of their last salary for 18 months. Generally speaking, Switzerland's employment protection is below the average of OECD countries. The Employment Protection Legislation (EPL) Index records low values (i.e., low protection) for Switzerland in all the components, except the "specific requirements for collective dismissal" component. In particular, the protection of permanent workers against individual dismissal is among the lowest in the OECD area (OECD 2013a).

2.3 Hypotheses

Starting from the conception of unemployment scarring and the socio-economic context we have introduced in section 2.2, we can define some hypotheses that lead our analyses.

We, first, pose a general hypothesis concerning the consequences of a period of unemployment on individual work trajectories. We postulate that unemployment has rather diverse effects on individual work trajectories according to workers' characteristics (Mooi-Reci and Ganzeboom 2015). While we expect traditional risk groups, such as women, foreigners, and older employees, to be more frequently affected by unemployment scarring, we also hypothesize that, in Switzerland (as opposed to other European countries), highly educated workers are also touched by unemployment scarring (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006).

In addition to this general hypothesis, we formulate a series of specific hypotheses that derive from the structure of the Swiss context and connect particular socio-demographic groups to the three dimensions of unemployment scarring we have identified.

We, first, posit that *long-term unemployment* touches in particular older and foreign workers. A number of studies shows the link between older workers (more than 55 years old) and long-term unemployment (AMOSA 2007a; Bigotta et al. 2011; OECD 2014; SECO 2015). A recent report by the Swiss State Secretariat for Economic Affairs stresses how the possibility to remain trapped in long-term unemployment is almost three times higher for old workers (more than 60 years old) in comparison with central ages (35-39 years old), and more than 14 times higher in comparison with young workers (20-24 years) (SECO 2015 : 11). Similarly, foreign workers suffer of a higher risk to fall in long-term unemployment (AMOSA 2007b; SECO 2015). It can be hypothesized, that these two groups are particularly hit by mechanisms of stigmatization, which renders it difficult for them to be reemployed after a spell of unemployment. In addition, we think that in the Swiss context, with relatively low unemployment ratios, well-educated workers also are at risk of becoming recurrently unemployed because of such processes of stigmatization. Exactly because the chances of becoming unemployed as a well-educated worker are so low, once one does become unemployed, employers might believe that one became unemployed due to a particularly low productivity. Cues of this phenomenon are present in previous studies (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006), but never discussed extensively.

Second, we expect *occupational downgrading* to be typical for women. Even though women are no longer used as a "labor market buffer" in periods of economic crisis (Flückiger et al. 2006; Gerfin and Lechner 2002; Giugni et al. 2014), female work positions remain particularly unstable, especially following the birth of the first child (Girardin et al. 2016; Giudici and Gauthier 2009; Le Goff and Levy 2016; Swiss Federal Statistical Office 2012; Widmer, Levy, and Kellerhals 2005). On the one hand, the female labor market participation is among the highest in Europe, and women that never enter in the labor market are a small minority (Le Goff 2005). On the other hand, the Swiss context is characterized by a comparatively short maternity leave, a shortage of child-care places and relatively traditional gender values (Buchmann et al. 2003). Therefore, we make the hypothesis that women that go through a period of unemployment, being already in a precarious position, could accept more easily an occupational downgrading in an exchange to a faster return in the labor market.

Even if it is a suboptimal solution, downgrading could be the most reasonable option to avoid long-term unemployment or other forms of exclusion from the labor market. A similar dynamic was already observed, but referred to another interruption of the employment: maternity (Mooi-Reci and Ganzeboom 2015).

Third, in line with other researches (Walker and Marti 2010) we expect *career instability* to be particularly virulent among individuals in lower socio-occupational positions. We hypothesize that this type of scarring can be an emergent reaction when other forms of responses to a spell of unemployment are structurally not available. In order to find a way back into the labor market, workers in lower socio-occupational positions have to reorient themselves with frequent job changes. For these groups at the bottom of the occupational structure, downgrading is no option and long-term unemployment is a particularly bleak prospect given the scarce financial resources. The only remaining alternative, if they want to return to the labor market, is a kind of continuous reorientation.

2.4 Data and methods

Sample and weights

The present study is based on the waves 1999-2011 of the Swiss Household Panel (SHP). This longitudinal survey includes 11,453 individuals, either from the first SHP-sample beginning in 1999 or from the second sample starting in 2004. The data of the Swiss Household Panel provides a large set of indicators and has a response rate of 64% (1999) and 65% (2004), in line with other European Panels (Erikson et al. 2003). In both SHP-samples, a retrospective monthly calendar questionnaire about the working status was filled in by totally 10,003 individuals aged at least 15 years. The variables and the unit of analysis come from the main individual sample and the retrospective monthly calendar questionnaire. Starting with these data, we select two samples: a "main sample" and a "control sample." The main sample consists of 532 individuals[4] who were unemployed for at least one month in the span of time included in the panel. The analyzed period includes the 48 months

[4] The small size of both the main and the control sample are due to the small proportion of Swiss residents being touched by unemployment. In certain cases, this situation prevents us from using more detailed analysis. For example, we are bound to use rather wide socio-occupational categories.

following the first month of unemployment, which allowed us to create long and complete sequences. To be included in the main sample, the sequence of an individual must contain at least 90% of valid values. We prefer this choice to the use of techniques to impute the missing values (McClelland 2000; Rubin 1987) or to manage sequences of different length (Elzinga 2003). Even though these techniques have doubtlessly advantages (for instance when it comes to sample size) they also include a series of disadvantages concerning the distortion in longitudinal analysis (which is crucial for our argument). The control sample includes 506 individuals. It consists of a group who is endowed with the same social characteristics as the main sample. We paired the sequences one by one, selecting the most similar individuals according to age (with a margin of ± 5 years), sex (male, female), cohort (with a margin of ± 5 years), nationality (Swiss, non-Swiss), residence (Lake Geneva Region, Mittelland, Northwestern Switzerland, Zürich, Eastern Switzerland, Central Switzerland, Ticino), social origin, education, and work condition before unemployment[5]. Moreover, the individuals in the control sample have to be employed or inactive during the first month of unemployment of the paired sequence in the main sample. We use simple hamming distances[6] (Lesnard 2006) to measure the differences between the individuals and to create a dissimilarity matrix. Starting from this dissimilarity matrix, every individual in the main sample is paired with the most similar individual in our data, ideally, someone who has the same values on all the quoted characteristics (a "perfect twin"). If no perfect twin can be found, we look for individuals with only one difference. We apply this rule recursively, allowing a further difference at any step. In order to avoid pairing individuals who are too dissimilar, we established a minimum condition: having the same age, sex, and two other characteristics in common. If even these minimal conditions are not satisfied, we defined the individual in the control sample as missing. This is the reason for the different sizes of the main and the control sample.

We weighted the data to maintain the representativeness of the sample. The main challenge concerning longitudinal weights is the definition of the values to be used as reference. While often one of the waves is chosen to provide the weights used as a reference (Watson 2012), we used the longitudinal averages (1999-2011). The weights are calculated keeping the proportions of the

[5] For the categories of the variables education, social origin, and last job, please refer to section 3.3

[6] We used this technique instead of others as we are considering sequences but a series of variables that have no specific order. Consequently, we want to consider only substitutions, and no other changes linked to the position of the variables.

geographical area constant (Lake Geneva Region, Mittelland, Northwestern Switzerland, Zürich, Eastern Switzerland, Central Switzerland, and Ticino), as well as sex (male, female), and age cohort (15-24, 25-49, 50+). The proportions of all these variables are rather stable in the considered span of time. Therefore, the average value of the years 1999-2011 can be used as a reference to calculate the weights with only small distortions. For the main sample, the weights are calculated referring to the characteristics of the unemployed population. For the control sample, the entire Swiss population is used as a reference. The weights of the control sample are also structured to compensate for selection bias (Peikes, Moreno, and Orzol 2008).

Variables

We use three sets of variables: sequential states for the sequence analysis and a set of independent and dependent variables within the regression analysis.

Sequential states: One of the major innovations of this article represents a refinement of an existing activity variable from the Swiss Household Panel. As the period after a spell of unemployment can be turbulent and fluctuating, it is a delicate issue to examine unemployment scarring using only yearly granularity. In order to remedy this weakness, we used a procedure that allows us to combine this monthly employment status information with the yearly information about the socio-occupational categories. We first defined the month of the interview for each individual and then attributed the year-based values for the socio-occupational categories directly to this monthly variable. Using the Swiss Socio-Occupational Categories (Joye and Schuler 1996), these variables can take the following categories: "top jobs" (including top managerial jobs and liberal professions), other "self-employed," "intellectuals and managers," "intermediate professionals," "skilled employees," "skilled manual workers" and "non-skilled workers." Starting from these points, we recoded the precedent/subsequent months with the same values until the beginning/end of the employment spell. The changing point of the spell is defined by monthly variables and consists of a declared job change or the passage from activity to unemployment or inactivity. If monthly variables indicate no employment changes: (a) we stopped the recoding at the month of the following interview when the yearly values that refer to two subsequent interviews are identical; or (b) we took the median month between the two interviews as the stopping point when the yearly values that refer to two subsequent interviews are different. The result of this operation is a set of sequences of monthly values indicating whether the individual is

unemployed, inactive, or works in one of the aforementioned socio-occupational categories. The category "undefined jobs" is used when the yearly value is missing or the considered month falls behind two stopping points (isolated spells). The final sequences start in the months M^0 and end in M^{48}, i.e. the four years later. For the main sample, M^0 is the first month of unemployment. For the control sample, M^0 is the first month of unemployment of the paired sequence in the main sample. The recoding technique we just described is a brand-new strategy that, to our knowledge, is here used for the first time.

Independent variables: In all the models, we use sex (man/woman), age group (15-24 years, 25-50 years, 50+years)[7], nationality (Swiss vs. foreign), social origin (high/medium/low), education (high/medium/low), and the starting work situation as independent variables. Social origin was constructed according to both parents' job position, grouped in three categories: high (liberal professions, intellectuals and managers), medium (intermediate professionals, other self-employed, skilled employees and workers), and low (non-skilled workers). When at least one of the parents' job positions was high and the other was at least medium, individuals' social origin was coded as "high;" if both parents' job positions were medium or one was high and the other was low, individuals' social origin was coded as "medium;" in all the other cases, individuals' social origin was coded as "low." Education level is coded in three categories: "low" (incomplete compulsory school; compulsory school, elementary vocational training; domestic science course; one-year school of commerce), "medium" (general training school; apprenticeship; full-time vocational school; bachelor/maturity; vocational high school with master's certificate, federal certificate), and "high" (university, other tertiary education institutions). The employment situation before the initial spell is defined by the most frequent occupational category during the 48 months prior to the initial spell of unemployment (M^{-48} to M^0). This dominant occupational situation was coded according to the Swiss Socio-Occupational Categories (Joye and Schuler 1996): "top jobs" (including top managerial jobs and liberal professions), other "self-employed," "intellectuals and managers," "intermediate professionals," "skilled employees," "skilled manual workers" and "non-skilled workers."

[7] The age groups are set to stress the situation of two populations often considered vulnerable: young and old workers. The category 25-50 years is the reference and collects workers in the most stable ages.

Dependent variables: Three dependent variables are used in the models to analyze the three scarring processes: long-term unemployment, occupational downgrading and career instability. All these variables are created from the sequential states described in the next paragraph (section 3.3). Long-term unemployment is defined by the likelihood of becoming a member of a specific group defined with sequence analysis (with reference to the likelihood to be in any other group). This group includes workers with work trajectories with an extended presence of unemployment. Occupational downgrading is measured by comparing the socio-occupational categories (i.e. the most frequent status) in the 48 months before unemployment with the socio-occupational trajectories (defined by the sequence analysis) during the 48 months subsequent to the unemployment spell. If the social-occupational category is lower after the spell of unemployment than before, we consider this change to be an example of occupational downgrading. Career instability is defined by the "complexity index" (C) as developed by Gabadinho and colleagues (Gabadinho et al. 2010; Gabadinho, Ritschard, Muller, et al. 2011). This measure combines the number of transitions in the sequence with the longitudinal entropy (time spent in each state). It is a normalized measure that can take values between 0 and 1. The value of 0 stands for a sequence with a single state, while the value of 1 represents only a sequence that (a) contains each of the states in the alphabet, (b) each state has the same length, and (c) the number of transitions is equal to the sequence length minus one.

Methodological strategy

This study uses sequence analysis to define a typology of employment trajectories and regression analysis to relate employment status to socio-demographic factors. All the analyses are done separately on the main and the control sample. The results of the control sample are the baseline to evaluate the results of the main sample. This procedure makes possible to distinguish the effects of unemployment scarring from the effects given from other elements, in particular, the evolution of work sequences during time that are independent from unemployment. This particular design combines multi-dimensional measures (i.e. our three indicators of unemployment scarring), longitudinal analysis and the comparison with a control sample. These analytical strategies are already used in the literature, but rarely combined together in a single methodological approach.

In the first phase of the analysis, we use sequence analysis to define trajectory types. Sequence analysis (Abbott 1990; Blanchard, Bühlmann, and Gauthier 2012) is composed of two steps: matching and clustering. Matching consists of the creation of the pairwise distance matrix that describes how

different each sequence is from the others. In this study, we used the optimal matching method with insertion/deletion cost of one and a constant substitution cost of two (Gabadinho, Ritschard, Muller, et al. 2011). Following Studer (2013), trajectory types are generated through a double cluster analysis. An initial Ward-weighted clustering creates a set of clusters that are used as starting groups for a Partition Around Medoids (PAM) weighted clustering. To evaluate the adequate number of clusters, we used weighted average silhouette width analysis (Rousseeuw 1987; Studer 2013) and Hubert's C Index (Hubert and Levin 1976; Studer 2013). In the main sample, a number of sequences begin in the middle of a period of unemployment (18 out of 532). For these workers, it is impossible to create a sequence that starts from the first period of unemployment. Nevertheless, we have the information about the (approximate) length of this non-observed period. Consequently, we adopt a manual correction, when needed. If the period was short (six months) we estimate that this difference does not affect the cluster attribution. Consequently, we adopt no corrections. If the period was longer than six months, we reassigned them manually to the cluster consisting of long-term unemployment.

In the second phase of the analysis, we used regression analysis to relate socio-demographic characteristics to the type of transition through unemployment. When we analyze the trend of the complexity index (see section 3.2), we use a weighted linear regression. Long-term unemployment, occupational downgrading are defined using the typology resulting from sequence analysis and analyzed with weighted multinomial logit regression, converged via neural networks (Ripley 1996; Venables and Ripley 2002). We relied on multinomial logit regression as it is a robust method already widely used to analyze categorical variables. Because of the small size of our sample, we opted for a model that converges using a neural networks algorithm instead of usually used techniques (e.g. maximum likelihood estimation). After few tests, we observe this algorithm to be the only one to give reliable solutions to our multinomial models. As regards the variation in career instability, we used a weighted generalized linear model converged via maximum likelihood estimation. For all our analyses, we tested the assumptions of the regression models and we found no violations[8]. In all our

[8] For the generalized linear model (Glm), we controlled for homoscedasticity, linearity, normality of the residuals distribution and multi-collinearity. We do not test for homoscedasticity, linearity and normality for the multinomial logit regression as it does not assume these conditions. We estimate correlations among the independent variables using Cramer's V (a measure based on Pearson's chi-squared statistic), and the variance inflation factor (VIF) using Ordinary Least Square regressions. We only find a slightly high multi-collinearity referred to the variables describing the education level and the employment situation before unemployment. We estimate this slightly high multi-collinearity to have no strong influence in the results. These levels are symmetrically present both in the main and in the control sample, so they do not distort the interpretation of the comparison between the effects of these variables in the two samples. In addition, the presence of multi-collinearity inflates the standard errors and can, in extreme cases, introduce only "false negatives" in the analysis, but never "false positives".

regressions, the significance of the beta values is set using the analysis of the probability to accept the null analysis (p-values). This technique suffers from threshold effects. To avoid this problem, we add a second calculation of the significance of our beta values showing the probability that the beta values are positive using a Bayesian a-posteriori distribution that postulate a non-informative a-priori distribution (Albert and Chib 1993). The probability of the Beta values being larger than zero can be read as the probability of the effect of the considered category being larger than the effect of the reference category. Even if this Bayesian significance is consistent with the frequentist test of the null-hypothesis, their values are not identical and can be used as complementary measures. In particular, beta values that have a p-value next to a chosen soil, can be more precisely discussed looking at the probability of the beta value to be positive calculated with the Bayesian approach. Starting from our regression models, we study the effect of a period of unemployment comparing the beta values and their significance between the main and the control sample. As refer to the weighted generalized linear models, the beta values can be compared directly as this model does not require any transformation of the output to evaluate the size of the effects. Contrarily, the multinomial regressions need the introduction of marginal effects to be comparable. Marginal effects can be read on a percentage scale and give a direct measure of the magnitude of the effects (Greene 2008).

2.5 A typology of unemployment trajectories

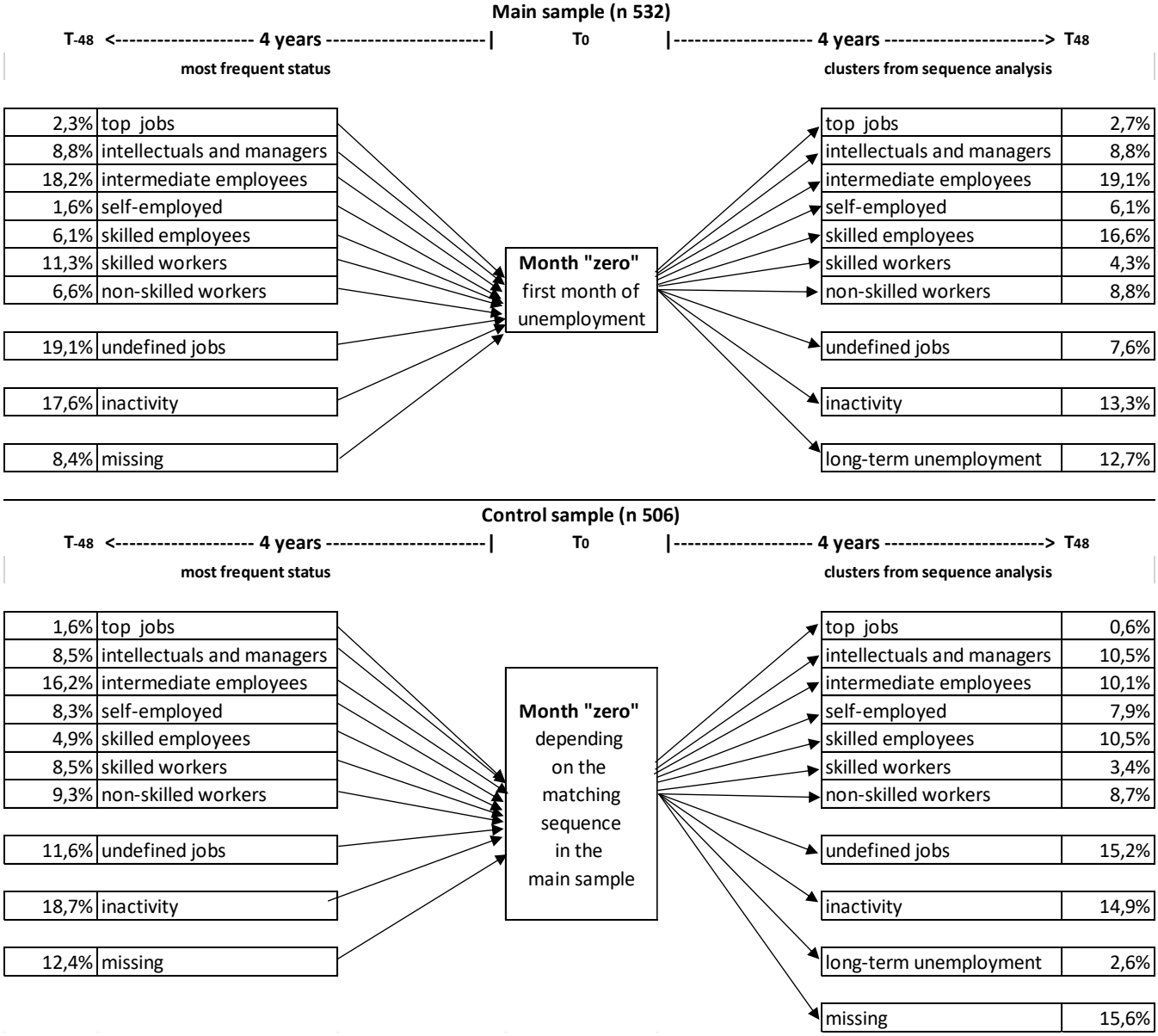
In the first analytical step, we focus on the general structure of unemployment work trajectories. We expect here that unemployment trajectories are rather diverse and that scarring risks touch both low and high-educated workers. To study this hypothesis, we examine the unfolding of trajectories affected by unemployment in descriptive terms.

Trajectories of unemployment and post-unemployment in the 48 months following "month zero"

Figure 1 shows the results of our descriptive analysis. The upper part of the graph refers to our main sample while the bottom part refers to control sample. On the left hand-side, we show the groups defined by the most frequent occupational category during the months M^{-48} to M^{0} before unemployment. On the right-hand side, we show the trajectory types we have identified by a sequence analyses on the months M^{0} to M^{48} subsequent to a spell of unemployment. The situation after the

passage through unemployment (top-right section of Figure 1) is the focus of our analysis. We compare these trajectories from M^0 to M^{48} of the main sample, with the situation before unemployment and with the control sample, whose members do not experience a situation of unemployment at the moment M^0.

Graph 2.1 - Groups of sequences before and after the month 0, main and control sample



The sequence analysis of this period M^0 to M^{48} in the main sample (top-right section of Figure 1) resulted in 10 trajectory-types, which each can be characterized by an occupational category which dominates the corresponding cluster: top jobs (2.7%), intellectuals and managers (8.8%), intermediate

professionals (19.1%), self-employed (6,1%), skilled employees (16.6%), skilled manual workers (4.3%), non-skilled employees (8.8%), undefined jobs (7.6%), inactivity (13.3%) and long-term unemployment (12.7%).

Socio-demographic composition of unemployment trajectories

In Table 2.1, we show the composition of the 10 trajectory-types covering the period from M^0 to M^{48} after a spell of unemployment (the top-right section of Figure 1). For each group, we indicate the average duration of unemployment and the instability (complexity index). In addition, we relate these groups of sequences to social categories that, in the literature on unemployment scarring, have been considered to be particularly risky: women, younger and older employees, foreigners, and low-educated workers.

Table 2.1 - Socio-demographic composition of post-unemployment work trajectory types

	Sex	Age		Nationality	Educational level	Complexity index	Months in unemp.	N
	woman	15-24	50+	non-CH	low		average	
Top jobs	46.7	0.0	46.7	60.0	0.0	0.120	6,8	15
Intellectuals and managers	29.8	4.3	21.3	35.9	0.0	0.155	4,5	47
Intermediate professionals	30.4	5.9	18.6	28.9	2.2	0.149	7,2	102
Self-employed	25.0	6.3	25.0	33.3	3.7	0.162	10,6	32
Skilled employees	54.5	17.0	8.0	33.8	10.4	0.188	6,7	88
Skilled manual workers	21.7	17.4	0.0	52.4	0.0	0.112	3,1	23
Non-skilled workers	67.4	25.0	9.1	63.4	95.1	0.159	6,0	46
Inactivity	47.9	31.5	29.6	25.4	44.3	0.167	10,9	71
Long-term unemployment	43.3	9.1	9.1	52.6	24.6	0.133	34,3	67
Undefined jobs	77.5	13.9	13.9	21.6	28.9	0.183	14,1	41
TOTAL	44.8	13.9	19.9	37.1	22.2	0.158	10,8	532

The following types are relatively balanced in terms of gender: trajectories into top jobs, skilled employees, individuals in long-term unemployment and, surprisingly, workers ending up in inactivity. However, we have to keep in mind that we are not able to distinguish the various types of inactivity: education, retirement, and other types of inactivity. All the other types are gendered, especially the

self-employed and skilled manual workers. When it comes to age, younger workers are almost absent in the upper part of the socio-occupational scale due to the time needed to acquire the qualifications and experience that are often preconditions for these positions. Old workers are strongly present in the trajectory types composed of self-employed workers and top jobs. In addition, senior workers are strongly present in the inactivity group. Foreign workers are present in the trajectory-types that lead to both high-end and low-end occupations. We can presume that this distribution is due to the presence of two well-known subgroups of immigrants: at one end, low-qualified workers from poor countries and Southern Europe, and at the other end, high-qualified workers from Northern Europe and other Western countries. Foreign workers are underrepresented in the inactivity group. This group is not homogeneous; consequently, it is hard to give an explication. Nevertheless, we know that foreigners often lack enough institutional and social support to afford long periods outside the labor market. Workers with a low education level are widely present in the trajectory type composed of workers ending up in unqualified jobs, while they are rather marginal in all the others.

The complexity index and the average duration of unemployment give us indications about the characteristics of workers' trajectories for each trajectory type. The trajectories leading to occupations in the upper part of the socio-professional scale are characterized by smooth transitions with low or average levels of instability (i.e. low complexity index) and a reduced length of unemployment. However, this favorable situation is not limited to the upper part of the socio-professional scale. Trajectories moving into skilled manual workers' job positions are among the smoothest. As opposed to this, trajectories moving into inactivity are characterized by long spells of unemployment, especially in the beginning. Finally, the trajectory type called long-term unemployment is (obviously) characterized by a long duration of unemployment and low instability, due to the exclusive stay of these workers in unemployment.

2.6 Long-term unemployment, occupational downgrading, and instability

In this second part of our analysis, we focus on our three specific hypotheses. We examine the three forms of potential unemployment scarring with respect to two sets of independent variables: a series of socio-demographic factors and the socio-occupational position prior to the spell of redundancy.

The risk of long-term unemployment

In this first section, we examine the likelihood of moving to a situation of long-term unemployment after an initial spell of joblessness. We evaluate this form of scarring by comparing the likelihood[9] to be member of the cluster "long-term unemployment" in the main and in the control sample (see Figure1). This is our dependent variable.

Table 2.2 - Weighted Multinomial logit regression model on the risk of becoming recurrently unemployed

		Control sample				Main sample			
		β Value		**β > REF†**	**Marginal Effects**	**β Value**		**β > REF†**	**Marginal Effects**
Intercept		-3.618	***			-2.995	***		
Independent variables									
Age	14-24 years	-13.677		49.5%	0.181	-0.256		44.1%	0.152
	25-50 years	REF				REF			
	50+ years	0.681		78.0%	0.169	2.002	***	>99.9%	0.395
Nationality	Swiss citizens	REF				REF			
	Foreign citizens	0.510		66.4%	-0.052	1.146	**	>99.9%	0.075
Education	High	-2.067		9.8%	-0.123	1.371	***	>99.9%	0.149
	Medium	REF				REF			
	Low	-1.698		14.2%	0.109	-0.647		28.1%	-0.106
Control variables									
Sex	Man	REF				REF			
	Woman	0.727		77.1%	-0.078	0.004		50.4%	0.046
Social origin	High	0.128		53.2%	-0.036	-0.868		6.9%	-0.123
	Medium	REF				REF			
	Low	0.432		67.6%	0.020	-1.443	**	2.4%	-0.096
Former job	Top jobs	-84.572	***	<0.01%	-0.070	0.990		82.8%	0.140
	Intellectuals and managers	-20.764	***	<0.01%	-0.055	-1.289		5.2%	-0.025
	Intermediate professionals	REF				REF			
	Self-employed	-27.028	***	<0.01%	-0.070	0.663		71.9%	0.147
	Skilled employees	-43.693	***	<0.01%	-0.063	-0.236		41.8%	0.048
	Skilled manual workers	-0.202		41.7%	0.051	0.138		58.0%	-0.076

[9] The reference is given by the likelihood to be included in a group that collects all the clusters that describe the trajectories that ends in a situation of employment.

Non-skilled workers	-37.831	***	<0.01%	0.131	0.385	61.1%	0.479
Undefined jobs	-17.972	***	<0.01%	-0.055	-0.022	48.5%	0.008
Inactivity	1.442		85.4%	0.626	-0.741	19.5%	0.007

P-values : '***' < 0.01 ; '**' < 0.05 ; '*' < 0.1

† Probability of the beta value to be larger than the reference calculated with the Bayesian procedure (see section 2.4 - methodological strategy)

Coherently with our hypotheses, in table 2.2, we present the beta values referred to the effect of three categories that we expect to be specifically interested by recurrent unemployment: old workers, foreigners and workers with high education. The other variables are used as control and are not discussed[10]. Our results show that elderly workers actually have a higher propensity to be long-term unemployed. They change from a non-significant difference (16.9 percentage points) compared to other age categories (control sample) to a probability that is 39.5 percentage points higher than workers aged 25 to 50 years old (main sample). The same pattern can be observed for foreign workers, but the probability is only 7.5 percentage points higher than for Swiss workers (starting from -5.2 percentage points). Together with these results, we find that also the third group expected to be vulnerable to long-term unemployment, i.e. workers with a higher education, have significantly higher probability of becoming long-term unemployed. They pass from a non-significant difference from the reference category (12.3 percentage points) to a probability that is 14.9 percentage points higher than workers that have medium or low education.

The risk of occupational downgrading after a period of unemployment

In this section, we examine the risk of occupational downgrading, i.e., the passage from a certain occupation to a less prestigious job. We calculate this risk comparing the most frequent occupational category in the 48 months leading to unemployment with the occupational trajectory in the 48 months subsequent to the spell of unemployment as given by our sequence analysis (please refer to Figure 1 for a graphical description of these groups). This is our dependent variable. The same operation on the control sample gives us the baseline measures for each group. Obviously, only workers who were employed before the transition through unemployment are eligible for this analysis.

[10] We do not discuss them also because, even if some variables record an increment, passing from the control to the main sample, in the likelihood to fall in long term unemployment, the probability that these increments are significantly different from zero, are less than the set threshold (95%).

Table 2.3 - Weighted Multinomial Logit Regression models comparing the risk of downgrading in the main and in the control sample

		Control sample				Main sample			
		β Value		**β > REF†**	**Marginal Effects**	**β Value**		**β > REF†**	**Marginal Effects**
Intercept		-3.747	***			-2.292	***		
Independent variables									
Sex	Man	REF				REF			
	Woman	-2.477	**	0.8%	-0.388	1.275	*	97.5%	0.059
Control variables									
Age	14-24 years	20.264		51.0%	1.008	0.772		63.9%	0.541
	25-50 years	REF				REF			
	50+ years	1.795	**	>99.9%	0.056	-2.478		5.3%	-0.234
Nationality	Swiss citizens	REF				REF			
	Foreign citizens	-16.737	***	<0.01%	-0.264	0.345		69.3%	0.065
Social origin	High	-1.165		23.7%	-0.341	1.604	**	98.6%	0.094
	Medium	REF				REF			
	Low	3.036	***	>99.9%	0.239	1.116		91.4%	0.349
Education	High	3.469	***	>99.9%	-0.090	-4.286	***	<0.01%	-0.535
	Medium	REF				REF			
	Low	4.107	**	97.6%	-0.003	22.415		51.8%	0.475
Former job	Top jobs	-31.423	***	<0.01%	-0.463	0.629		65.0%	-0.392
	Intellectuals and managers	-3.535	***	<0.01%	-0.400	3.776	***	>99.9%	0.452
	Intermediate professionals	REF				REF			
	Self-employed	-5.375	***	<0.01%	-0.344	-31.164		47.5%	0.795
	Skilled employees	37.114	***	>99.9%	1.537	2.257	**	>99.9%	-0.312
	Skilled manual workers	-24.049		48.6%	0.450	-29.757	***	<0.01%	0.285
	Non-skilled workers	NA				NA			

P-values : '***' < 0.01 ; '**' < 0.05 ; '*' < 0.1

† Probability of the beta value to be larger than the reference calculated with the Bayesian procedure (see section 2.4 - methodological strategy)

In line with our hypotheses, we expected women to be the category mostly touched by downgrading after a spell of unemployment. Examining the beta values and marginal effects in Table 2.3[11], we observe that, in the control sample women have a probability of downgrading that is 38.8 percentage points lower than men's. However, when they go through a period of unemployment (main sample),

[11] Similarly to what we have done for table 2.2, we do not discuss the control variables.

women have a probability of downgrading that is 5.9 percentage points higher than that of men. These values clearly show that going through a period of unemployment strongly increases the likelihood of downgrading much more for women than for men. While in the control sample man have a larger likelihood than women to be live a professional downgrading, the situation is completely overturned when a period of unemployment is introduced.

The risk of an unstable trajectory after a period of unemployment

Our last measure of unemployment scarring examines the stability of the subsequent employment trajectory. As the instability index is a continuous measure, it can be calculated by directly comparing the control sample with the sample that includes a period of joblessness. The effect of unemployment is reported in the last column of Table 2.4.

Table 2.4: Weighted Generalized Linear Regression model comparing the risk of instability in the main and in the control sample

		Control sample			Main sample			Effect		Change Net effect
		β Value		β > REF†	β Value		β > REF†	Control	Main	
Intercept		0.069	***		0.156	***		0.069	0.156	0.086
Independent variables										
Education	High	0.013		86.8%	0.005		66.3%	0	0	0
	Medium	REF			REF					--
	Low	-0.047	***	<0.01%	-0.014		17.4%	-0.047	0	0.047
Social origin	High	-0.018		10.2%	-0.001		47.9%	0	0	0
	Medium	REF			REF					--
	Low	-0.020	*	3.4%	-0.011		15.7%	-0.020	0	0.020
Former job	Top jobs	-0.073	***	0.4%	-0.039		9.0%	-0.073	0	0.073
	Intellectuals and managers	-0.011		21.6%	-0.004		40.0%	0	0	0
	Intermediate professionals	REF			REF					--
	Self-employed	0.017		87.4%	-0.007		40.2%	0	0	0
	Skilled employees	-0.003		45.0%	-0.030	*	4.6%	0	-0.030	-0.030
	Skilled manual workers	0.006		65.0%	0.032	**	99.3%	0	0.032	0.032
	Non-skilled workers	0.026		88.4%	0.044	**	98.2%	0	0.044	0.044
	Undefined job	-0.011		20.9%	0.004		61.2%	0	0	0
	Inactivity	0.029	*	97.5%	0.029	**	97.9%	0.029	0.029	0.000

Control variables

Sex	Man	REF			REF					--
	Woman	-0.013		8.5%	0.001		56.4%	0	0	0
Age	14-24 years	0.048	***	>99.9%	0.035	**	98.3%	0.048	0.035	-0.012
	25-50 years	REF			REF					---
	50+ years	0.022	**	98.8%	-0.009		18.4%	0.022	0	-0.022
Nationality	Swiss citizens	REF			REF					--
	Foreign citizens	-0.005		35.0%	-0.018	*	2.6%	0	-0.018	-0.018

P-values : '***' < 0.01 ; '**' < 0.05 ; '*' < 0.1

† Probability of the beta value to be larger than the reference calculated with the Bayesian procedure (see section 2.4 - methodological strategy)

Unemployment increases the general level of instability (+0.086). However, this effect is not homogeneous in all the groups. Coherently with our hypotheses the workers with a pre-unemployment position at the bottom of the socio-occupational scale and workers with a low educational level or low social origins are more affected by career instability after a spell of unemployment. The net change effect is +0.047 points for low educated workers, +0.044 for non-skilled workers, +0.032 for skilled manual workers, and +0.020 for workers with low social origins. Nevertheless, the largest effect on the stability, unexpectedly, is observed for workers in the top jobs: +0.073[12].

2.7 The consequences of a period of unemployment

We consider *long-term unemployment* as a form of permanent exclusion. The membership in this cluster is therefore hardly the result of a specific strategy or choice. The respondents are repeatedly made redundant or remain redundant for a long time. They may have no alternative choices and struggle constantly to get back into the labor market. We hypothesized that these forms of long-term unemployment are due to stigmatizations and stereotypisation that concern particularly older and foreign workers. Our regression model largely confirms this hypothesis. Also, well-educated groups, once they become unemployed, suffer significantly more from these forms of long-term unemployment than other groups. Other studies have also found hints for this specific form of vulnerability (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006), but the phenomenon has never been extensively discussed. We can imagine that a different form of

[12] The quoted categories are the categories that have the strongest increment in the instability of employment trajectories. The results do not change when considering the non-significant effects.

stigmatization, typical for the Swiss context, might potentially affect this group. Because unemployment is so rare in Switzerland, employers might implicitly pigeonhole unemployed workers with a high educational level as being "problematic" and suspect them of underperforming or of being temperamentally difficult.

To accept occupational *downgrading* seems to be another "strategy" for getting back into the labor market. We expected that particularly women would pursue this strategy. Our results clearly confirm that women have a higher likelihood to experience downgrading after a spell of unemployment. This might be due to changes into lower-status, but a quicker return to employment. Switzerland, even though it has one of the highest female labor market participation rates, is also known to for the presence of a difficult conciliation of work and family life, especially after the birth of the first child (Bühlmann, Elcheroth, and Tettamanti 2010; Girardin et al. 2016; Giudici and Gauthier 2009; Le Goff and Levy 2016). It could therefore be, that Swiss women, being already in a more precarious position than men, prefer a solution (downgrading) that, even if it is far to be optimal, is preferable to the risk of other situations, such as long-term unemployment or other forms of exclusion from the labor market.

Finally, we posited that *career instability* after a spell of unemployment might be a strategy of reorientation or adaptation for those who are unable to downgrade or cannot permit themselves to remain unemployed for a longer period. Compared to those who are long-term unemployed, this group is able to get back and remain in the labor market after a period of unemployment. We therefore posit, in particular, that those in the lowest position of the occupational hierarchy or those with a low education have to recur to this adaptation strategy. This hypothesis is confirmed by our results: it is skilled manual workers, non-skilled workers, and more generally, low-educated workers who have a high risk of career instability. Unexpectedly, workers in top jobs also have very unstable careers after a spell of unemployment. We might think of two possible explanations for this: first, we can presume that, for workers at the top of the occupational scale, given the low Swiss unemployment rate, it is particularly difficult to get back into the labor market after a potentially stigmatizing unemployment period. Second, we can hypothesize that this phase of reorientation corresponds for these workers to a strategy to find the best available job. These workers have a wide set of resources that allows them to move voluntarily from job to job and, even, afford periods outside the labor market.

2.8 Conclusion

In this contribution, we analyzed the scarring effect of joblessness using an innovative framework that goes beyond the causal analysis of wage loss. We studied whole trajectories of unemployment and examined the occurrence of three alternative forms of scarring: long-term unemployment, occupational downgrading, and career instability. Concentrating on the Swiss context, we argued that different groups are exposed to different forms of unemployment scarring as a result of different mechanisms. The study was based on data from the Swiss household panel and compared a main sample (n=532) whose members experienced a spell of unemployment with a control sample. Our methodological strategy combined a description and classification of unemployment trajectories with sequence analysis and regression analysis that related the different scarring issues to a series of socio-demographic and biographical variables.

Our hypothesis referring to the general structure of unemployment work trajectories has been confirmed. We showed that "the unemployed" are not a homogeneous group, but are composed of diverse, sometimes socially distant or even opposed sub-groups. The three sub-hypotheses also seemed to hold, at least to a large extent: besides foreigners and older workers, *long-term unemployment* affects also higher-educated workers (who might be stigmatized particularly in the Swiss context of low unemployment). *Occupational downgrading* is a largely female phenomenon. It occurs to women who might experience a depreciation of their educational capital or a transition to more motherhood-friendly sectors after an employment interruption. Finally, as hypothesized, career *instability* affects workers in low socio-economic positions who can neither afford to be completely excluded nor rely on downgrading. However, it also affects workers in high occupational positions; we can assume that they experience particularly turbulent reorientation phases after potentially stigmatizing spells of unemployment or an active strategy to find the best job position available.

These findings lead us to the conclusion that unemployment is not an isolated event, but a process with multiple short and long-term consequences. Therefore, unemployment scarring has to be considered as a whole trajectory that already begins at occurrence of unemployment and not only subsequent to a period of unemployment. We also conclude that unemployment scarring takes a variety of forms that cannot be recognized with the study of wage loss. What is more, some of these forms of scarring are typical for specific groups and can be explained by specific mechanisms of

scarring. Therefore, future research on unemployment scarring should emancipate from the general comparison of theories (for example stigmatization vs. human capital theories) and rather ask: which theory fits for which group and which form of unemployment scarring?

Methodological annex to chapter 2

Introduction – Enriching the data we already have

Panel datasets have a long history in social research and they are taking more and more space in contemporary analyses. Longitudinal studies are now widespread and the techniques to analyze variables that change during time are in constant evolution. Established techniques as sequence analysis (Abbott 1990) and event history analysis (Allison 1984; Cox and Oakes 1984) are developed and combined with other methodological instruments to pursue more precise and more complete results. Multichannel sequence analysis (Gauthier et al. 2010), discrepancy analysis (Studer et al. 2011), network analysis applied to sequence data (Bison 2014), Bayesian survival analysis (Ibrahim, Chen, and Sinha 2001) are all example of the vitality of the methodological debate around panel data. As most of the statistical procedures, all these techniques reveal the most interesting results when they are applied to « high quality » data. Usually a database is considered high quality when it collects many cases, many variables, few missing values (including the non-responses), and precise measures. For panel data, we have to add a further dimension: measures have to be as temporarily fine grained as possible. This last condition is hard to achieve. Repeated measures close in time dramatically increase the risk of non-response and drop-out in any panel that needs the active participation of individuals, groups or institutions. The reasons for this are numerous. Limitations have both technical and practical origins. The logistic behind frequent data collections have huge monetary and organizational costs. This is an element often forgotten when speaking about methodology in social science, but it is central in any empirical study. Any proposed methodology has to fit within the capacity of the research unit. In addition, even if a repeated data collection with little intervals is possible, the realization is not easy. Respondents hardly engage themselves in intensive, long and repeated activities. Researchers need to manage carefully the intrusion in individuals' life and, when possible, reduce the data collection to quick and easy tasks. As a consequence, longitudinal databases only rarely have data that are both detailed and recorded in frequent intervals. Retrospective calendars or others a-posteriori techniques (Belli 1998; Morselli et al. 2016) are a valid alternative, but they are neither reliable on long periods nor precise due to memory and other effects (Conway and Rubin 1993). Most of the people have imprecise memories and even the memories that are clearly embedded in individuals' minds are affected by social reinterpretations (Collins et al. 1993; Halbwachs 1925, 1950). Furthermore, panel data are often framed in multipurpose researches. These studies use long questionnaires which cannot be submitted frequently or include very detailed retrospective data collections. A usual solution to these problems is a compromise that combines a reasonable distance between each data collection and measures that are precise enough to give an accurate description of the phenomenon without charging the respondent with an overwhelming task. This compromise is

normally reached through the combination of different techniques. For example, in many individual-based panels, data are collected once a year and include precise measures of many life domains as well as retrospective calendars with less accurate monthly information about a reduced number of variables. This is the case of the *Swiss Household Panel* (SHP) (Voorpostel et al. 2015), the *European Union Statistics on Income and Living Conditions* (EU-SILC) (Santourian and Ntakou 2014), the Canadian *Paths on Life's Way* (Andres and Offerhaus 2013), and others panels. The usual result of this procedure is a double database: a dataset with many time points (usually months), but limited information, and a dataset with few time points (usually years), but richer information.

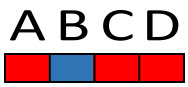
The main target of this methodological appendix is to introduce a technique to combine these two types of information. We introduce a strategy based on a recursive recoding of the short-interval variables based on the information included in the long-interval variables. We claim that this procedure allows the researcher to have robust estimations of the real values without implying further data collections.

In this work, we firstly explain the necessity to have rich and high quality longitudinal information with short time intervals. We, then, explain recursive recoding step by step, its strong and weak points, and the applicability of our procedure to other research designs. Finally, we introduce a long example that uses a graphic representation to show how our procedure creates estimations of the unobserved variables. A conclusion finalizes our presentation.

The importance of rich longitudinal information with short time intervals

Many longitudinal databases have rich long-interval variables and less detailed short-interval variables. The researcher interested in a longitudinal analysis has to face a choice. On the one hand, the researcher can choose to use the short-interval variables and be very precise in the description of changes, but imprecise in the measures. On the other, the researcher can choose to use the long-interval variables and favor the analysis of the measure over the description of the change. There is a tradeoff between precision in the description of the changes and the temporal granularity of the measure. We can illustrate this tradeoff using the measure of the work activity in the Swiss Household Panel as example. In this database, we have two measures of work activity. The first is formed by yearly data that includes various measures of the job activity (e.g. ISCO-88 as used by the International Labor Organization, NAGA as used by Swiss public administration). The second is formed by monthly data that includes only the type of activity (full-time, part-time, inactivity, unemployment, social support). The researchers who want to use monthly data have to constrain their research perspective. For instance, a study on occupational mobility (i.e. the passage to a better or

worst job position) is impossible. If researchers want to address this question, they have to use yearly data and choose precision concerning the measures, but imprecision in the description of the changes. The yearly data are more precise, but bring some distortions. In the best case, all the changes with time spans shorter than one year (or seven months depending to the codification) are lost. In the worst case, if the data collection is based only on the date of the interview, the work sequence can appear completely distorted. For instance, we take the following hypothetical year-based work sequence:



In this sequence, the color blue indicates a year of unemployment while the color red indicates a year in a full-time employment job position. This sequence shows a career with a majority of states (three) characterized by full-time employment job with a few shorter spells of unemployment (one year). This hypothetical year-based sequence hides a more complex pattern that is visible in the month-based sequence:

As before, the color blue indicates a month of unemployment while the color red indicates a month in a full-time employment job position. The letters A to D indicate the months where the yearly interviews are taken. This month-based sequence shows a career dominated by unemployment (27 months, the majority) spaced out by short periods of full-time employment (21 months in total). This is a quite extreme case. Even more extreme sequences can be build (up to 45 months of unemployment), but most of the real careers have consistent month-based and year-based sequences. We use this example to show how long-interval (yearly) measures can misrepresent the evolution of a variable. Unlike short-interval measures that are imprecise only due to external factors (respondent reticence or organizational limitations), long-interval measures always bring the risk to misrepresent the evolution of the variable. The greater precision of the short-interval measures makes them more adapt to any type of analysis. The only reason in favor of the use of long-interval measures is the lack of precise content. The methodological technique we introduce in the next sections is an attempt to remove, at least partially, this last obstacle.

The type of phenomenon under analysis changes dramatically the importance of time intervals. If the issue under study is the evolution of the form of govern of a nation, years can be short-intervals. At the contrary, if the researcher focuses the attention on individual's life-course changes, one year is a long-interval. From this observation follows that, obviously, any time interval can be considered a long-interval and split in smaller units. Nevertheless, it is not always important to use the smallest available unit. For example, if the researcher analyzes individual's work careers, months can be a

good (short) interval that does not need to be split further. Work contracts often begin or end with the passage from a month to another.

The recursive recoding procedure: transferring long-intervals information on short-intervals variables

In this section, we describe the procedure how to transform long-interval variables into short-interval variables. We proceed step by step, describing even the simplest and technic operations. The procedure is composed of eight steps:

1. Organize the short-interval and long-interval variables as sequences.
   The first step of our procedure is the creation of a set of sequences that includes the values of the short-interval variables in the State-Sequence (STS) format (Gabadinho, Ritschard, Muller, et al. 2011). The same operation has to be done for the long-interval variables.
2. Definition of the categories included in the short-interval variables that have to be recoded.
   Starting from the list of the categories included in the short-interval variables, we need to define which ones bring an information that can be enriched using long-interval variables. At least one category has to be defined and all the category can be included, if necessary.
3. Creation of a new set of short-interval variables.
   A further preparatory step is the creation of the new short-interval variables. To create this new set, we simply copy the old month-based variables. Similarly to what done before, this new set of short-interval variables needs to be encoded in the State-Sequence (STS) format (Gabadinho, Ritschard, Muller, et al. 2011). All the operations are done on the new set of short-interval variables.
4. Definition of the starting points.
   The starting points are specific time units in the short-interval sequences. We need them to set a reference for our recursive recoding. They correspond to the time units that indicate (a) the start of the sequences, and (b) the period in which long-interval variables are measured. The start of the sequences is easy to identify while the other starting points can change for each unit of analysis. We have to rely on a specific variable reporting the dates of the data gathering. In many panels, it is present in the metadata or is available on request.
5. Definition of the stopping points (for forward recursive recoding).
   Similarly to what we have done in point 3, we need reference points to stop the recursive recoding. Without these reference points, the recoding would overwrite useful information. Unlike the starting points, the definition of the stopping point requires an ad hoc procedure.

From each starting point, we proceed forward (i.e. toward the end of the sequence) time unit by time unit until we find one of the following four situations. First, we encounter a time unit that contains an information that we do not want to recode (see point 2). In this case, that time unit is defined as a stopping point. Second, we have an external variable reporting information useful to set certain time units as stopping points. If we encounter one of this time units, we set a stopping point. An example of this situation is the presence of a variable that reports the dates of the changes in the job positions. It can be used to set the stopping points in activity sequences that do not record the job positions. Third, we encounter a starting point. In this case, the stopping point is defined in the median time unit between the starting point we start from and the starting point we encounter. If the number of time units included between the starting points is even, the time point that is one step closer to the starting point we encounter is defined as a stopping point. For example, if we start from the starting point in the time unit 10, and we proceed until we encounter the starting point in the time unit 22, the stopping point is set in the time unit 16. It is equidistant from 10 and 22 (|10-16| = 6 and |22-16| = 6). If the second starting point is in the time unit 23, the stopping point is set in the time unit 17. It is one step closer from 23 than from 10 (|10-17| = 7 and |23-17| = 6). The fourth and last condition to set a stopping point is the end of the sequence. In this case, we set a stopping point in the following time unit.

6. Recursive recoding: forward (i.e. toward the end of the sequence)

   Once we have the references (starting and stopping points), we can proceed with a first part of the recursive recording. From the starting points, we proceed forward (i.e. toward the end of the sequence) we substitute the values of the short-intervals variable with the value of the long-intervals variable reported in the starting point. If the value of the long-intervals variable is missing, a missing code can be set as a substitution value. This is useful if we want to understand which new short-intervals variables are missing because the old short-intervals variables were missing (total missing values) and which are missing because the long-intervals variable was missing (partial missing values). These two situations can be coded differently. The total missing values are in time units not involved in the recoding, so they maintain the missing code of the short-interval variables, while the partial missing values are a result of the procedure of coding, and a new code can be attributed.

7. Definition of the stopping points (for backward recursive recoding).

   This operation is identical to what it is done in point 4. The only difference concerns the direction of the procedure: instead of proceeding from the starting points towards the end of the sequence, we procced in the direction of the start of the sequence. Similarly to what

happens for the end of the sequence, also the start of the sequence defines a stopping point (in the time unit just before the start of the sequence).

8. Recursive recoding: backward (i.e. toward the start of the sequence)

   The last point of our procedure is the second part of the recoding. This operation is identical to what it is done in point 5. The only difference relies on the direction of the procedure: instead of proceeding from the starting points in the direction of the end of the sequence, we procced in the direction of the start of the sequence. From the starting points, we proceed backward (i.e. toward the start of the sequence) we substitute the values of the short-intervals variable with the value of the long-intervals variable reported in the starting point. Again, if the value of the long-intervals variable is missing, a missing code can be set as a substitution value.

Once we have completed the second part of the recoding, the new short-interval variables are ready. They include the information stemming from the old short-interval variables (see point 1) and the information provided by the long-interval variables.

Results, strong and weak points, and applicability

The new short-interval variables contain three types of values. *First*, values coming from the long-interval variables. These are the complete results, what we want. *Second*, values coming from the old short-interval variables. These can be either complete results, if they refer to a category that does not need to be recoded, or "partial missing values". Partial missing values are incomplete results as they differ from the result that we were looking for. We define them "partial missing values" because they still bring an information that comes from the old short-interval variables, even if it is not as rich as the complete results. There are two possible causes of "partial missing values". They can be due to the presence of missing values in long-interval variables. If the value reported in the nearest starting point, is missing, the recording procedure has no valid value to complete the substitution. A special code can be introduced or the values from the old short-interval variable can be maintained. Another possible source of partial missing values is the presence of "isolated spells". Isolated spells are part of the sequences created with the new short-interval variables that are included between two stopping points. The recursive recoding cannot transform these values because it is not able to reach them. For these spells, the new short-interval variables are identical to the old short-interval variables. The *third* type of results that can be generated by the described procedure are "total missing values". These values are a consequence of the presence of missing values in the starting short-interval variables. In this case, there is no base for the recoding.

The presence of missing values in the output is an example of the limitation of the described procedure. As it is clear, an incomplete information can come from the procedure itself (isolated spells) or inaccuracies present in the initial data (missing or wrong information). Despite these possible limitations, the final short-interval variables are richer then both the starting short-interval and long-interval variables. On the one hand, like the long-interval variables, they provide a more precise information. On the other, like the old short-interval variables, they are much more time sensitive. These qualities make the new short-interval variables more efficient for the description and the analysis, especially for phenomena that undergo frequent changes. Other strong points are the easiness and the vast technical applicability of the procedure. The algorithm is based only on "if clauses" and loops, two operations that are included in every programming language. Also, the conceptual applicability is vast. The easiest possibility is to use the recursive recording to combine two variables referred to the same phenomenon. For example, yearly measures of the job position can be used to enrich monthly measures that contain only activity statuses (like part-time work, full-time work, unemployment, and inactivity). Other more complicate solutions can be envisaged. The procedure can be used every time the original database includes the time points in which the variables are measured. For example, residential arrangements can be combined with family status, employment trajectories with job satisfaction, or activity status with family condition.

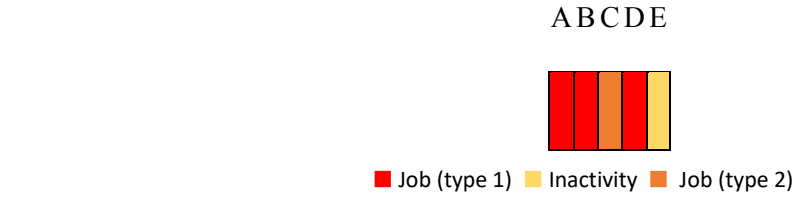
To conclude, we recall that we introduced a procedure that successfully combined the information present in long-interval variables sequences with others present in short-interval variables sequences. This procedure enriches the information we already have and opens the road for new and more precise analyses.

A visual example

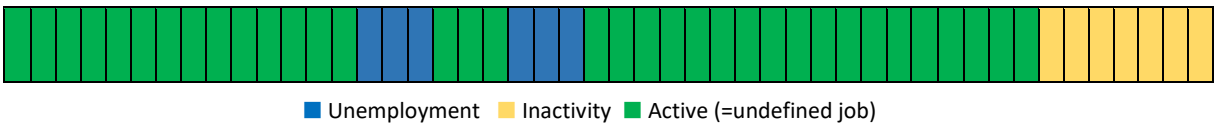
We start from two databases. The first refers to year-based measures. It provides data about the activity status and the type of job. The possible statuses are: "Inactivity", "Unemployment", "Job-type 1" and "Job-type 2". The data are collected in five yearly interviews with irregular gaps. The second database provides monthly measures. It collects data about the activity status only. The possible statuses are: "Inactivity", "Unemployment", and "Active". We have 48 month-based variables. To these data, we apply the recursive recoding described in section 3 of this study. We proceed point by point, but we do not recall the entire procedure. We graphically show the changes on an exemplar sequence completed with a simple description.

1. Organize the short-interval and long-interval variables as sequences.

   We describe the database that includes yearly measures under the form of a sequence (State-Sequence format). Each year is defined by a letter from A to E.

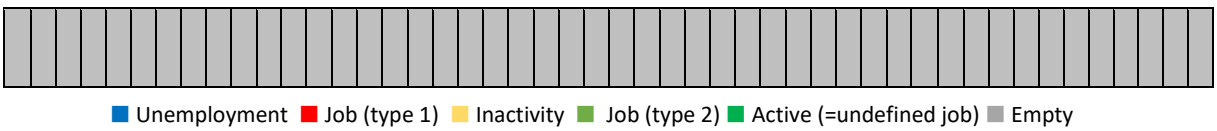


   Then, we describe the database that includes monthly measures under the form of a sequence (State-Sequence format).

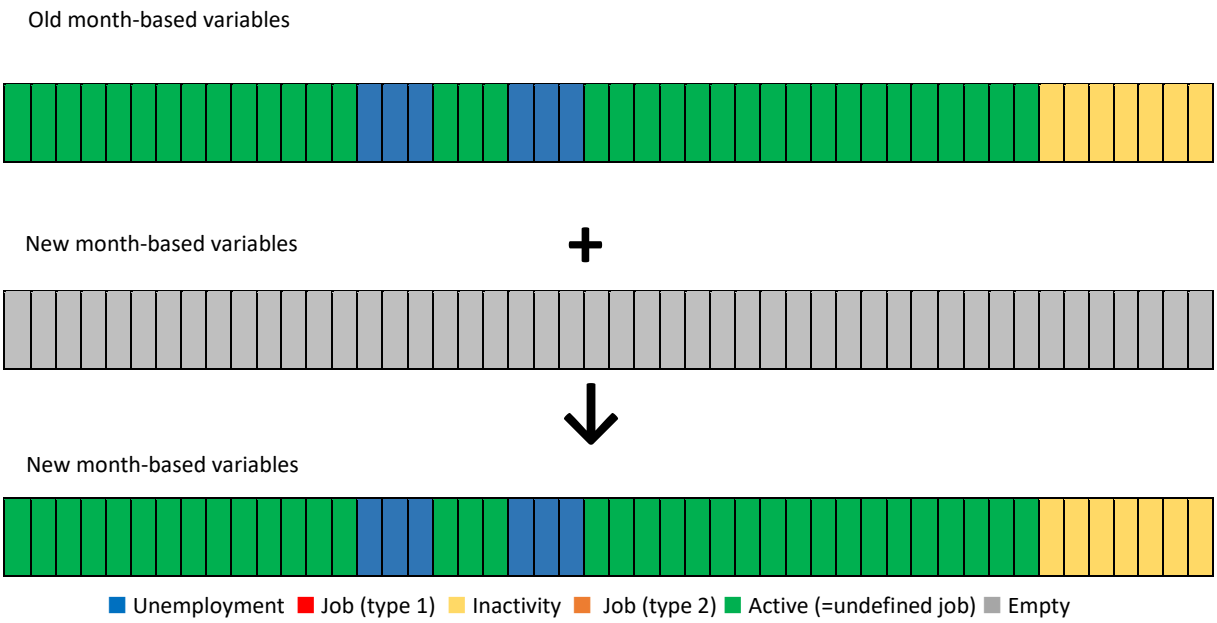


2. Definition of the categories included in the short-interval variables that has to be recoded. Our aim is to add the information about the type of job to the monthly sequences. Consequently, we put the "Active" (i.e. undefined job) in the list of the categories that have to be recoded. All the other categories are in the list of the variables that mustn't be recorded. In our data, being unemployed or inactive is not compatible with any job position.
3. Creation of a new set of short-interval variables.

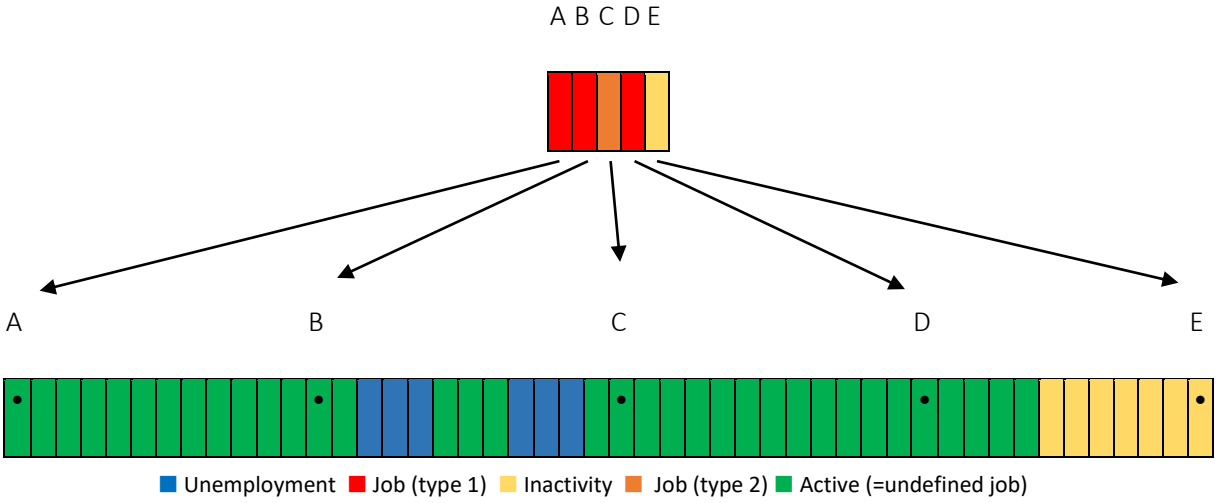
   We create a new set of empty monthly variables.



   We copy the old monthly variables in the new ones.



4. Definition of the starting points. The dates of the yearly measures define these points.



5. Definition of the stopping points (for forward recursive recoding).

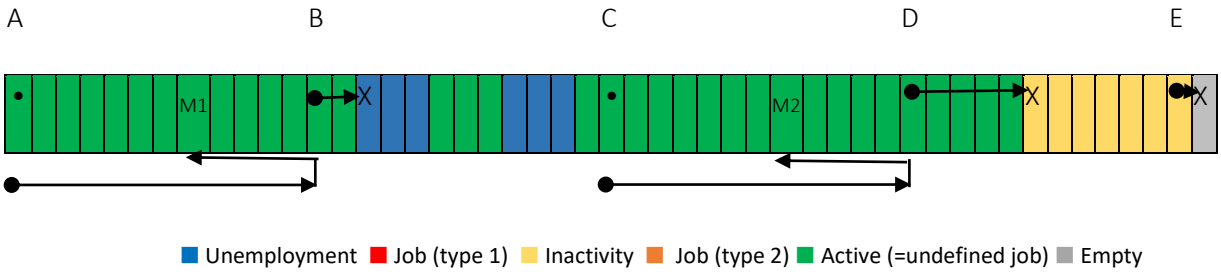
   From the starting point A to the starting point B there is no discontinuity: the stopping point is set in the month just after the median month (M1).

   From the starting point B to the starting point C there is a stopping point after two months (i.e. in the first month of unemployment).

From the starting point C to the starting point D there is neither a discontinuity in the sequence nor a discontinuity given by external sources of information. The stopping point is set the month just after the median month (M2).

From the starting point D to starting point E there is a stopping point after five months (i.e. in the first month of inactivity).

The starting point E contains the value "inactivity". This status is in the list of categories that mustn't be recoded. As a consequence, a stopping point is set in the first month after the starting point. As the point E is in the last month, the stopping point is set in the hypothetical fist month after the end of the sequence.



6. Recursive recoding: forward (i.e. toward the end of the sequence).

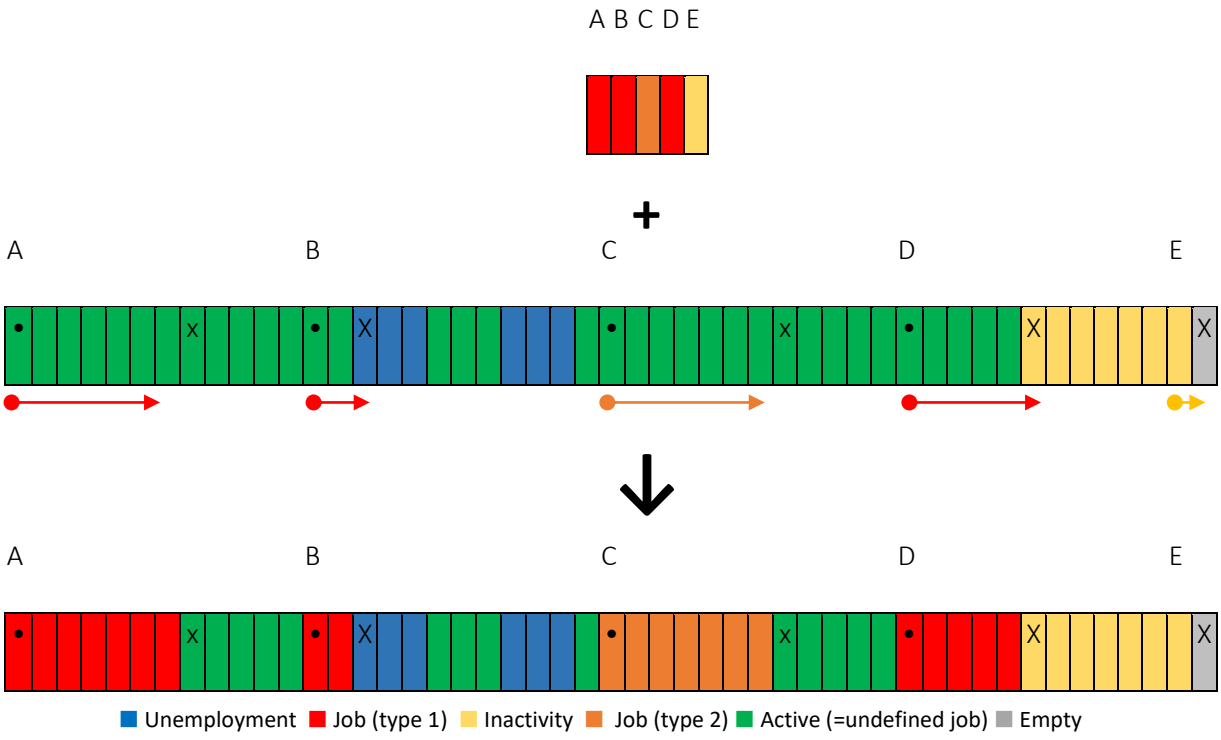
   From the starting point A, we recode the monthly variables with the "Job (type 1)" value until the stopping point (excluded).

   From the starting point B, we recode the monthly variables with the "Job (type 1)" value until the stopping point (excluded).

   From the starting point C, we recode the monthly variables with the "Job (type 2)" value until the stopping point (excluded).

   From the starting point D, we recode the monthly variables with the "Job (type 1)" value until the stopping point (excluded).

   The starting point E report a status that mustn't be recoded. No recoding is done.



7. Definition of the stopping points (for backward recursive recoding).

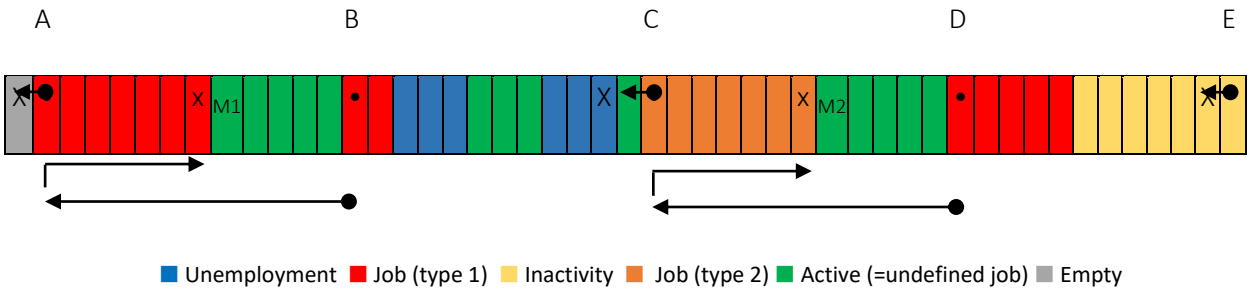
   The starting point A is the first month of the sequence. Consequently, the stopping point is set in the hypothetical fist month before the start of the sequence.

   From the starting point B to the starting point A there is no discontinuity: the stopping point is set the month just before the median month (M1).

   From the starting point C to the starting point B there is a stopping point after two months (i.e. in the first month of unemployment).

   From the starting point D to the starting point C there is neither a discontinuity in the sequence nor a discontinuity given by external sources of information. The stopping point is set the month just before the median month (M2).

   The starting point E contains the value “inactivity”. This status is in the list of categories that mustn’t be recoded. As a consequence, a stopping point is set in the first month before the starting point.



8. Recursive recoding: backward (i.e. toward the start of the sequence)

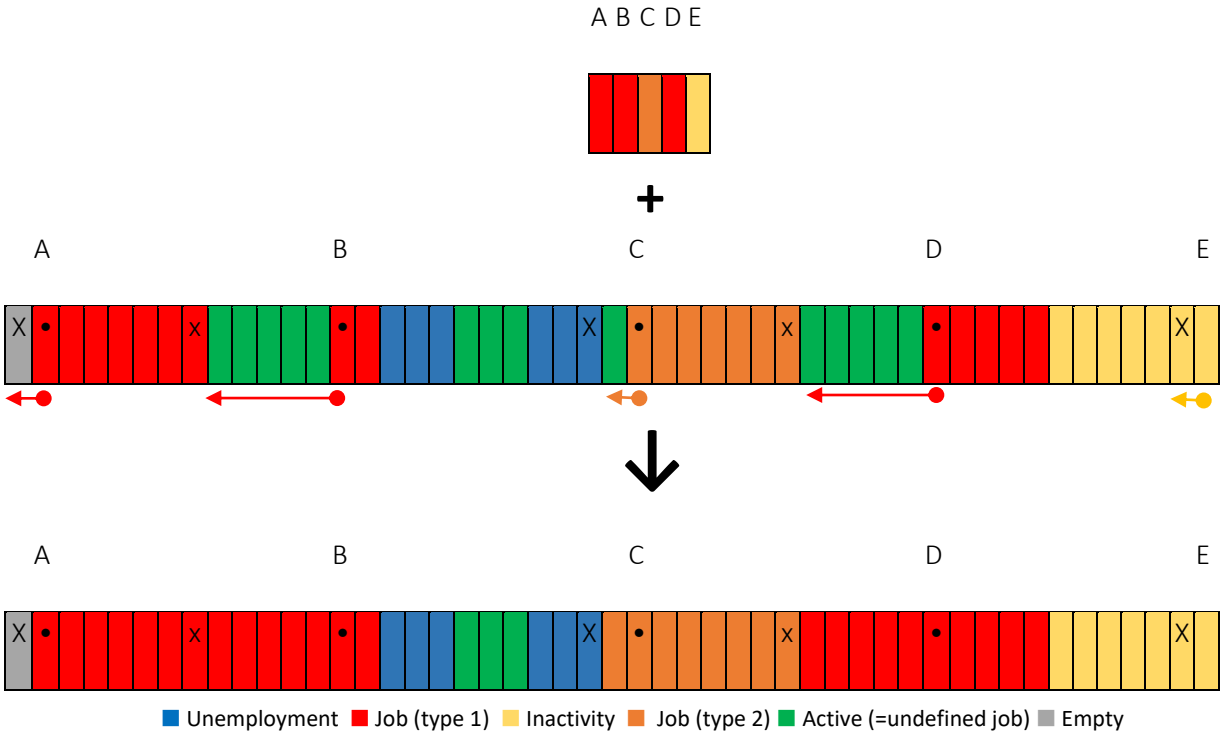
   From the starting point A, we recode (backward) the monthly variables with the "Job (type 1)" value until the stopping point (excluded). As no months are included in this section of the sequence, no recoding is done.

   From the starting point B, we recode (backward) the monthly variables with the "Job (type 1)" value until the stopping point (excluded).

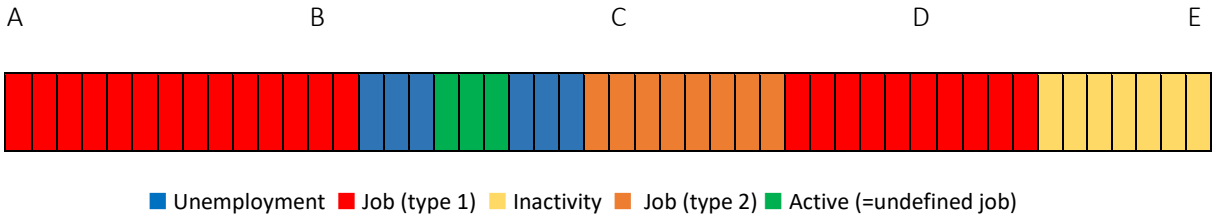
   From the starting point C, we recode (backward) the monthly variables with the "Job (type 2)" value until the stopping point (excluded).

   From the starting point D, we recode (backward) the monthly variables with the "Job (type 1)" value until the stopping point (excluded).

   The starting point E report a status that must not be recoded. No recoding is done.



Once the recursive recording is over, the sequence that we took as an example includes information coming from both our monthly and yearly variables.



This sequence has two critical sections. The first are the three months framed between the two periods of unemployment. This is an isolated spell that brings "partial values". We know that the person was active in that period, but we do not know which type of activity (s)he was doing. Some pieces of information are present, but we were not able to enrich them. The second concerns the period between the starting points C and D. Given our data, we know that the worker change his/her job position somewhere after the month C, but before the month D. Nevertheless, we do not know when: this information is missing. In these cases, our procedure splits this section of the sequence in two identical halves. This is an arbitrary decision. Other choices are possible and legitimate.

Conclusion

Panel datasets often have a structure that combines variables rich in details but collected on long intervals with variables poor in details but collected on short intervals. We propose a recursive recoding that enriches the short-interval variables with the information included in the long-interval variables. The resulting variables are precise and bring a rich information. These are important characteristics for any type of analysis. It is important to keep in mind that our procedure returns estimations of the short-interval values. These estimations can differ from the real values. Sometime critical points are detectable (isolated spells, missing changes), but others can remain unnoticed. The probability to encounter these critical points depends from the data analyzed. The statuses in some variables, i.e. psychological states, change quicker than others, i.e. job positions. Despite these limitations, our procedure produces estimations that are strongly based on the empirical evidence. These estimations enrich datasets we already have making possible a wider range of research design.

CHAPTER 3

A new typology to catch the differences in Swiss labor markets

3.1 Introduction

Switzerland is a complex territory. The history of this country and the recent socio-economic trends have created a very heterogeneous territorial structure both in the institutional set-up and in the socio-economic fabric. To some extent, this situation is present in almost every country, but the numerous territorial aggregations that lead to present day Switzerland, led to a federation of largely autonomous and heterogeneous areas. Switzerland has 26 main institutional territories (cantons), while other much bigger European countries are split into fewer areas: Germany has 16 main areas (states), France 18 (regions), Spain 17 (communities), Italy 20 (regions) and Austria, which has a similar territory and population to Switzerland, 9 (states). The geographical variable is therefore complex to manage. For many studies, the cantons are too numerous and too small to be included in the analysis. In particular, this territorial set-up is a considerable obstacle when it comes to describing labor market characteristics that follow economic relations disconnected from the institutional borders. The creation of a typology grouping similar labor markets is a possible way to overcome this issue. This effort was already made in Swiss literature (e.g. Battaglini et Giraud 2003; Flückiger et al. 2006), but is limited to the analysis of specific socio-economic elements. A wide-range typology is absent. Consequently, current research widely uses different measures of geographic disparities both as explicative and control variables. The most frequently used measures rely on cultural variables (e.g. the prevalent language), or on the European Nomenclature of Units for Territorial Statistics (NUTS), known in Switzerland as "Vast Regions". These measures are used in research on economic and labor market topics, for example, gender-related wage gaps (Bertschy et al. 2014), the process of leaving the parental home (Wernli et Henchoz 2015), school-to-work transitions (Sacchi et Meyer 2016), and job-related life satisfaction (Lebert 2014). Despite the importance of these territorial divisions, a typology rooted on socio-economic variables would bring further value to the results of research that are focused on economic and labor market dynamics. The aim of this study is to propose a typology that concisely describes the regional differences in the Swiss labor market in recent years (2008 - 2015). The proposed typology is based on a vast set of variables and can be used as a tool for the entire labor market and all the socio-economic studies that seek to integrate indicators of regional differences in their empirical analysis.

This study is organized as follows: after a brief description of the Swiss socio-economic context (section 2), we present the measures currently used to evaluate the differences in the Swiss internal labor market (section 3). In section 4, we introduce the data and the method used to create our typology. This typology is fully described and discussed in section 5. In section 6, we use data from the Swiss Household Panel to explore the heuristic power and to show a possible use of our typology.

Finally, in the conclusion, we recall the procedure, the results, and the possible developments of our research.

3.2 The Swiss socio-economic context

Switzerland is quite a unique case in the European context. The institutional set-up is based on 26 federated states named "cantons". Despite the cantons losing a large part of their power after the passage from a Confederative to a Federative set-up in 1848, the central government often provides only a general legislative frame, leaving its application to the cantons. We can call this institutional set-up "executive federalism", borrowing the term used to describe the application of the federal law on unemployment (Battaglini et Giraud 2003). Economically, Switzerland is a stable market that records a high (though not equally widespread) purchasing power and many business facilitations. Workers' protections are underdeveloped compared to other European countries. The OECD Employment Protection Legislation (EPL) Index records low values for Switzerland in almost all the components. In particular, the protection of permanent workers against individual dismissal is among the lowest of the OECD (OECD 2013a). The economic fabric is also diverse. High-tech and international companies as well as highly specialized enterprises are present together with activities with a low added value. While some sectors are largely integrated in the international market economy, activities with a low added value (especially agriculture) are based on a national market and largely protected from foreign competition (Giugni, et al. 2014). Unemployment was almost absent in Switzerland until the early 1990s. This very low level was maintained during the periods of crisis of the mid-1970s and early 1980s, using the foreign and the female workforce as a buffer (Flückiger et al. 2006; Gerfin et Lechner 2002; Giugni et al. 2014). This varied economic and labor market structure makes Switzerland hard to situate in the most used categorizations of welfare states as it presents characteristics of different models (Bertozzi et al. 2005; Giugni et al. 2014). The strong participation of the population in the workforce, especially in regards to women and elderly workers (Le Goff 2005; OECD 2014), is similar to the Scandinavian countries, but the presence of the working poor suggests a similarity with the Anglo-Saxon liberal labor markets. On the other hand, the education system in Switzerland is similar to other countries of the Germanic area such as Germany, Austria, and Denmark. All these countries have a dual education system that links vocational training and occupational placement together in the labor market. This option is chosen by more than 60% of the young Swiss.

3.3 Theoretical frame

Epidemiologic perspective and rigid geographic divisions

There are two main ways to deal with geographical variables: (a) adopt an epidemiologic perspective considering the diffusion of a phenomenon above a territory or (b) rely on rigid geographical divisions, and consider a territory as composed by homogeneous areas.

The last two decades saw several developments in the epidemiologic perspective. Among the major contributions, we find the "diffusion or contagion models" (Ward 2002) and the "spatially autoregressive models" (Savitz et Raudenbush 2009). These models define the distribution of the variables referring to "metrical" measures (e.g. square kilometers) or to the distance from reference points. Using specific thresholds, the researcher creates small areas, which are then re-aggregated in bigger areas according to the research interests and independently from the institutional borders (Chaix et al. 2005). Different types of connections between areas can also be introduced to consider natural obstacles or other boundaries. These techniques are particularly useful to analyze spatial characteristics that are separated from administrative territories. The second approach relies on rigid geographical divisions. This is the "classical" way to study geography-related variables. It relies on typologies based on institutional or other divisions previously made for administrative or scientific purposes. In sections 3.2 and 3.3, we describe the institutional and variable-based typologies currently in use. In this study, we follow this approach due to its flexibility and easiness to use in studies that are not specifically focused on the analysis of spatial divisions. As we intend our typology as a tool for further analyses, the user-friendly dimension is essential. Nevertheless, we are aware of the limits of this technique (Chaix et al. 2005). Particularly, some assumptions have to be accepted. First, each territory is considered homogeneous concerning the considered variables. Second, the transitions from one territory to another are not gradual. There are no transitional areas. Third, each type is a simplified representation of the reality. Any nuance is lost in favor of a homogeneous description. Fourth, the features of an area are not directly transferable to sub areas or to the individual level. Otherwise, we commit an "ecological fallacy" (Pintaldi 2003).

Official divisions

The Swiss administrative division is complex and relies on different criteria depending on the purposes of the institutions that created them (see Schuler et al. 2005 for a review of Swiss administrative divisions).

The main administrative divisions are the cantons. The country includes 26 cantons that vary largely in dimension and population. Some cantons are the size of small towns (e.g. Appenzell Innerrhoden), while others include only a city with its suburbs (e.g. Basel-Stadt or Geneva). Some cantons are vastly populated areas (e.g. Bern), while others refer to poorly inhabited alpine areas (e.g. Graubünden). On the political level, cantons have a large decisional autonomy. Even if the federal laws are the same for every territory, the actual policies may vary considerably. A good example is the application of the policies against unemployment. The normative coming from the federal government are applied in different, often opposite, ways. Some cantons have very active policies focusing both on workers' reintegration and control over abuses, while others have a very light structure with almost no support or control (Battaglini et Giraud 2003). Despite its vast use in the literature, the institutional division based on cantons is sometimes hard to use in empirical analyses, due to the high number of units (26) and to the presence of very small groups. These limitations are particularly severe in sample-based analyses as this division dramatically increases the possibility of having territories with very few or no individuals included in the sample.

Excessive heterogeneity and the high number of cantons are often overcome using another administrative division that groups the 26 cantons into 7 "Vast Regions". This typology is widely used and follows the second level of the Eurostat's "Nomenclature of Units for Territorial Statistics" (NUTS). This division includes areas with a population between 800,000 and 3 million inhabitants. The population size is the only criterion, but it is not applied strictly. Cultural and historical divisions are somehow respected as well as country borders. Consequently, two vast Swiss regions (Central Switzerland and Ticino) have less than 800,000 inhabitants. Nevertheless, no economic or social variables are considered. This division has unquestionable advantages from an administrative and statistical point of view as it relies on regions that are comparable in population size and are sufficiently vast to include the attraction areas around the biggest cities, which often goes beyond cantonal borders. It is consequently also used outside the administrative context (e.g. Feld et Savioz 2000; Lebert 2014). Nevertheless, the imposed territorial continuity and the prominent role of population size over other characteristics are strong limits for the applicability of this typology in labor market studies.

Labor market typologies made out of specific variables

The analysis of regional differences in Swiss labor markets has recorded many contributions in past decades, especially from an economic point of view (De Coulon 1999; Flückiger et al. 1986; Joly et al. 1993) and a sociological one (Bruttin 1997; Filippini 1998). In this section, we focus only on

recent developments in this field of study. As these analyses rely on parameters that change over time, a commentary on old studies is hardly meaningful.

A very influential analysis of regional differences in Swiss labor markets relies on the description of cantonal policies against unemployment (Battaglini and Giraud 2003; Giraud and Battaglini 2004; Perret et al. 2007). The authors define a typology that considers "on the one hand, active labor market programs aimed at supporting the reintegration of the unemployed with control measures designed to prevent abuse of unemployment benefits on the other" (Battaglini et Giraud 2003, 286). Unlike previous studies (e.g. Curti et Meins 1999; Giriens et Staufer 1999), this typology aims at the analysis of both the extension and the modes of cantonal implementation of the federal law. Four indicators are used to measure two dimensions called "reintegration" and "control". Reintegration measures the local application of the federal law and considers three dimensions: (a) the implementation of a "logistic", i.e. the organization of devices to analyze the needs of employers and the qualifications of job-seekers in order to organize specific training programs, (b) the implementation of experimental programs to develop federal norms, (c) the fulfillment of federal targets. Control considers how the cantons prevent and fight abuses. A single dimension, i.e. the number of penalties decided by cantonal offices, measures it. The results are summed up in Table 3.1.

Table 3.1 - Reintegration/control model (adapted from Battaglini and Giraud 2003)

		Reintegration		
		High		Low
Control	High	**Basel-Stadt** **Luzern** **Solothurn** Graubünden Schwyz	Bern *Aargau* *Glarus* *Basel-Landschaft* *St. Gallen*	**Uri** **Obwalden** **Nidwalden**
	Low	**Jura** **Valais** **Ticino** **Fribourg** **Vaud**	Geneva Neuchâtel Zug *Zürich*	**Appenzell Ausserrhoden** **Appenzell Innerrhoden**

Reintegration is considered high when at least one indicator is present. Otherwise, it is considered low. Control is considered high if the single indicator is fulfilled. Otherwise, it is considered low. Four types are defined:

1. "Maximalist" implementation: high reintegration and high control
2. "Partial, control-oriented" implementation: low reintegration and high control
3. "Partial, reintegration-oriented" implementation: high reintegration and low control
4. "Minimalist" implementation: low reintegration and low control

Cantons in bold are fully representative of the group while cantons in italics are only marginally included in it. Schaffhausen and Thurgau are not present in the typology as data are missing for these cantons.

Not surprisingly, the Latin part of Switzerland, which is traditionally more progressive, is split from the rest of the country. The only exception is represented by the Zurich metropolitan area (cantons of Zurich and Zug). All the Latin cantons are included in the "partial, reintegration-oriented" group while the majority of the German-speaking cantons are in the "maximalist" cluster. Only some small cantons of the Germanic area are included in the remaining groups.

Alternative approaches to describe the regional differences in Swiss labor markets are present in a wide report called *Analyse des différences régionales de chômage* (Flückiger et al. 2006). This study summarizes a lot of previous research (De Coulon 1999; Feld et Savioz 2000; Flückiger et Vassiliev 2002) and applies different approaches. First, it analyzes the Beveridge curve and the regional effect for each canton. This measure describes the independence of each territory from the national economic trend. A set of values is reported but a typology is not present. Second, the report considers the average exit time from a situation of unemployment. Three levels are introduced:

- Fast exit (Appenzell Innerrhoden, Basel-Landschaft, Basel-Stadt, Bern, Graubünden, Schwyz, Zürich)
- Intermediate exit (Glarus, Nidwalden, Obwalden, Schaffhausen)
- Slow exit (Geneva)

The other 14 cantons are missing. Together with these results, a more complete description is given by a typology considering two variables: unemployment rate and average unemployment length. Unemployment rate is considered high if it is included in the first quartile and low if it is included in the last quartile. The same distinction is applied to unemployment length. Five categories are therefore identifiable: high unemployment rate and high unemployment length (Geneva, Vaud, Neuchâtel, Jura and Ticino); low unemployment rate and high unemployment length (Aargau); high unemployment rate and low unemployment length (Valais); low unemployment rate and low unemployment length (Uri, Obwalden, Graubünden and Nidwalden); all the other cantons are in the intermediate group (medium unemployment rate and medium unemployment length). These categories are purely descriptive and only define precisely the extreme cases. To overcome these limitations, the authors propose a further typology based on individual characteristics and including some explanatory variables: activity before unemployment, age, sex, qualification and nationality. Five groups are defined. The relation among the groups and the explanatory variables are shown in Table 3.2: "-" means negative significant relation, "+" means positive significant relation.

Table 3.2 - Typology and correlated factors (adapted from Flückiger et al. 2006)

	Activity before unemployment	Age	Female	High qualification	Foreign
Group 1	-	+	+	-	+
Group 2	-	+			+
Group 3	-		+		
Group 4	-	+	+	+	+
Group 5	-	+	+	-	

The five groups include the following cantons:

- Group 1: Neuchâtel, St. Gallen, Thurgau, Vaud, Zurich;
- Group 2: Basel-Landschaft, Fribourg, Schwyz, Solothurn, Zug;
- Group 3: Appenzell Ausserrhoden, Glarus, Jura, Valais;
- Group 4: Aargau, Basel-Stadt, Bern, Ticino;
- Group 5: Geneva, Luzern.

Appenzell Innerrhoden, Graubünden, Nidwalden, Obwalden, Schaffhausen and Uri are not categorized due to data limitations. This typology is the most complete regarding the number and the type of variables used for the analysis. Nevertheless, it relies on individual-level variables and not on canton-level variables. This change in the level of analysis can lead to an "ecological fallacy" (Pintaldi 2003). Consequently, using these results to describe the differences among the cantons is rather dangerous. In unemployment-related topics, particularly, the link between individual employment trajectories and global labor market situation is not always strong (Oesch et Baumann 2015).

A new typology to overcome some general limits of the literature

All the introduced typologies suffer from at least one of the following three limitations. First, the number of variables used to describe the cantons is low (in many cases, just one variable is used). This leads to unidimensional descriptions, which give us deep but limited information. Second, the identified types are often too many. Even if these typologies simplify the information, the complexity often remains too high to be easily managed as an independent or control variable in other analyses. Third, the typologies often fail to categorize all the cantons. Due to a lack of information or due to the structure of the analysis (based on relative values), some cantons are left outside of the typology. Our proposal is to create a typology based on a large number of economic and labor market variables that reduces the territorial dimensions in few groups and that includes all the cantons. Cantons are chosen to be the base unit for three main reasons. (a) Cantons are the administrative level that actually perform labor market and economic policies. Consequently, this is the most used level of analysis in

unemployment, labor market and socio-economic studies. (b) Cantons are often the more precise available information about the residence and/or the place of work. Often, the town of residence is not available for reasons linked to the anonymization processes, especially in the case of small communities. (c) The information about the economic and labor market features of smaller administrative areas (e.g. municipalities) is often inexistent, especially for small towns or country areas.

3.4 Data and method

Data and variables

Our data come from different periodical surveys conducted by the Swiss Statistical Office (FSO-OFS) and the Swiss Federal Department for Economic Affairs. The results of these surveys are included in the FSO-OFS's interactive database (STAT-TAB). All the data and the variables are retrieved from this database. We want our typology to be descriptive of many socio-economic and labor market aspects of Swiss regions. For the selection of the measures to include in our analysis, we follow a criterion based on a theoretical reflection and previous literature. Unfortunately, time series of these data are not always available at the cantonal level. We were not able to find a single year of reference for all the variables. Consequently, we decided to take the most recent value for each variable in order to have an updated portrait of Swiss economic and labor market structure. We have to rely on measures based on different years, from 2008 to 2015. This is not the optimal methodological solution, but the time span is small and the oldest measures refer to characteristics that are rather stable on short spans of time (i.e. the presence of high-tech companies). In addition, we analyzed the trend of much more volatile variables (e.g. GDP per capita). Obviously, the numerical values change during the years, but the relative position of each canton in the Swiss context remains rather stable. As our analyses are based on relative positions, the outputs are almost identical. Consequently, we posit that the variations given by the use of different time points that occurred in these years are marginal and do not affect our results. Nevertheless, similarly to what happens for other typologies, if our typology will become an instrument for other analyses, periodical updates will be necessary to revalidate its structure. In absence of dramatic events (such as war or a generalized economic crisis), the economic structure of a region changes only in the medium-long term. Consequently, these updates will be necessary but not frequent.

The variables used to create our typology are split in two groups. The first refers to cantonal economy, the second to labor market characteristics. The economic variables include:

- Gross Domestic Product (GDP) per capita in the year 2012. This information, although disputed (Stiglitz et al. 2010), is still a relevant overall measure of cantonal wealth and is widely used in reports and analyses (e.g. Goebel et Ehrensperger 2009; Jeanneret et Goebel 2012).
- The variation of the Gross Domestic Product (GDP) per capita. Data refer to the period 2008-2012 and moderate eventual outliers linked to the 2012 measure.
- The correlation between the trends of the cantonal and national Gross Domestic Product (GDP) per capita for the period 2008-2012. With this measure, we want to explore the connection between the national and the cantonal economy. This characteristic is crucial to define if an area is linked to the local economy or if it is framed in a vaster world economy. Despite the use of different indicators, previous contributions (De Coulon 1999; Flückiger et al. 2006) stressed the importance of measuring the independence of cantonal economy from national trends in order to identify the regional differences in the Swiss economic fabric.
- The Gini Index in 2010. This measure is not used in previous Swiss research. Nevertheless, it is widely used at the international level (e.g. Barro 2000; Kubiszewski et al. 2013) to complete the information given by the GDP. If GDP is an overall measure of wealth, the Gini index reports its distribution.
- The percentage of Small and Medium Enterprises (SMEs) on the total in 2008. This is fundamental information on the local economic structure (Goebel et Ehrensperger 2009; Jeanneret et Goebel 2012).
- Presence of high-tech enterprises on the total in 2008. High-tech enterprises are defined according to the criteria used in the official Nomenclature of the Economic Activities (Swiss Federal Statistical Office 2008). This element is one of the main indicators of the local economic structure (Goebel et Ehrensperger 2009; Jeanneret et Goebel 2012).
- Global index of tax pressure referring to the year 2015. This measure completes the description of the economic structure and introduces an element linked with cantonal political choices. We chose this measure instead of others, as tax-related decisions have a long-term structure based on gradual changes.

The second group of variables refers to cantonal labor market characteristics:

- Unemployment rate in 2015. This is among the major measures for labor market studies (Battaglini et Giraud 2003; Perret et al. 2007).
- Youth unemployment rate in 2015. Alongside the general measure, we introduce youth unemployment as this dimension is an index of the openness of the job market towards new workers, as well as the efficacy of the connection between school and labor market.

- Long-term unemployment in 2015. This is a specific sub-population of unemployed workers. This measure is one of the main variables used to understand the structure of the unemployment population (Bonoli 2014a; Sheldon 2013).
- Share of women in the labor market. It is defined as the percentage of women in the workforce in 2010. This measure is often present in labor market reports (e.g. Goebel et Ehrensperger 2009; Jeanneret et Goebel 2012) as it describes the openness of regional labor markets to non-traditional workers and measures the reactiveness to the increasing presence of Swiss women in the labor force.
- The presence of cross-border workers in 2015. Swiss border areas are characterized by a high share of cross-border workers. Labor markets in these areas are different from the inner areas as the presence of cross-border workers is linked to other labor market dynamics, unemployment in particular (De Coulon 1999; Feld et Savioz 2000).
- The attractiveness of the cantonal labor market for commuters, calculated with the net presence of national commuter workers, i.e. the difference between incoming and outgoing commuters. These data refer to the year 2014. Job-related mobility is a central topic in today's welfare policies (Guillet et al. 2016) and influences other elements of the labor market fabric (Ravalet et al. 2014).

Method

Our typology is created using a cluster analysis on the values of the variables introduced in section 4.1 and with cantons as the unit of analysis. A possible division among the algorithms for clustering separates "hard clustering" from "soft (or fuzzy) clustering" algorithms. Hard clustering associates each unit to a specific cluster. The usual interpretation of hard clustering relies on a deterministic attribution and absence of outliers. Soft clustering, on the contrary, associates each unit to a vector of probabilities. Each probability refers to a specific cluster and a specific unit. They describe the likelihood of that unit to be included in that cluster and always sum to one. If a threshold for cluster membership is set, this likelihood describes both the position of each unit inside the clusters and the eventual presence of outliers.

We decide to use a fuzzy clustering technique as it has a number of advantages. First, fuzzy clustering makes the discussion of outliers easier. Their presence is directly observable in the output, with no need for further analyses. This makes it possible to avoid having some units forced into a cluster only to respect the prefixed number of clusters. This feature is not opposed to our aim of creating a typology that includes all the cantons. Outliers are part of the results. We include them in the final

results and consider them as special types of our typology. A second advantage of fuzzy clustering is the presence of a measure of the likelihood to be part of each cluster. This measure can be used to identify the most representative units of each cluster and to give a portrait of cluster composition. Thirdly, in fuzzy clustering, cluster membership is expressed by a percentage, i.e. a cardinal variable, instead of a categorical variable. This property facilitates the analysis of the relations among cluster membership and other variables.

Among the fuzzy clustering algorithms, we choose a method named Fanny (Kaufman et Rousseeuw 1990). The membership exponent is set to 2 and the dissimilarities are measured with Euclidean distances. These are the standard settings for this type of analysis (Kaufman et Rousseeuw 1990). The number of clusters is defined using a double parameter: silhouette analysis (Rousseeuw 1987) and Hubert C index (Hubert et Levin 1976). Both these indexes define the number of clusters that minimize the distance among units included in the same cluster and maximize the distance among units included in different clusters. The threshold is set to 0.5. It means that each cluster collects only cantons that have a probability to be included in the cluster that is above the 50%. Like all the thresholds, 0.5 is an arbitrary value. Nevertheless, this is a symbolic level as it means that the likelihood to be included in a cluster is more than all the likelihoods to be included in all the other clusters combined.

Fuzzy clustering is an unusual procedure for this type of analysis. Consequently, we run a set on sensitivity tests. Our objective is to replicate our results using the same units of analysis and the same variables, but different techniques. Fist, we maintain our technique, Fanny clustering, and we change the way we calculate the distances. We test squared Euclidean distances and Manhattan distances (Krause 1986). Second, we use C-means (Bezdek 1981), another algorithm for fuzzy clustering, and the combination of Ward and Partition Around Medoids (PAM) clustering as described by Studer (2013). This last algorithm is an algorithm for hard clustering therefore no outliers and no description of clusters composition are allowed. Consequently, in order to make our results fully comparable for this test, we have to change the procedure to include the units in the clusters. Starting from the results obtained with the Fanny algorithm we remove the 50% threshold. We use the highest probability recorded by each unit to decide in which cluster it has to be assigned. Using these settings, the Fanny algorithm becomes a hard clustering procedure that gives results that are comparable with the Ward/PAM clustering.

Once the set of clusters is defined and the robustness of the procedure is tested, we describe the characteristics of each cluster, relating the probabilities to be part of a cluster with the values of the variables used to create them. As all the used variables are cardinal, we calculate the gross correlation using the Pearson's correlation index. This index varies from -1 to 1, where -1 means perfect negative

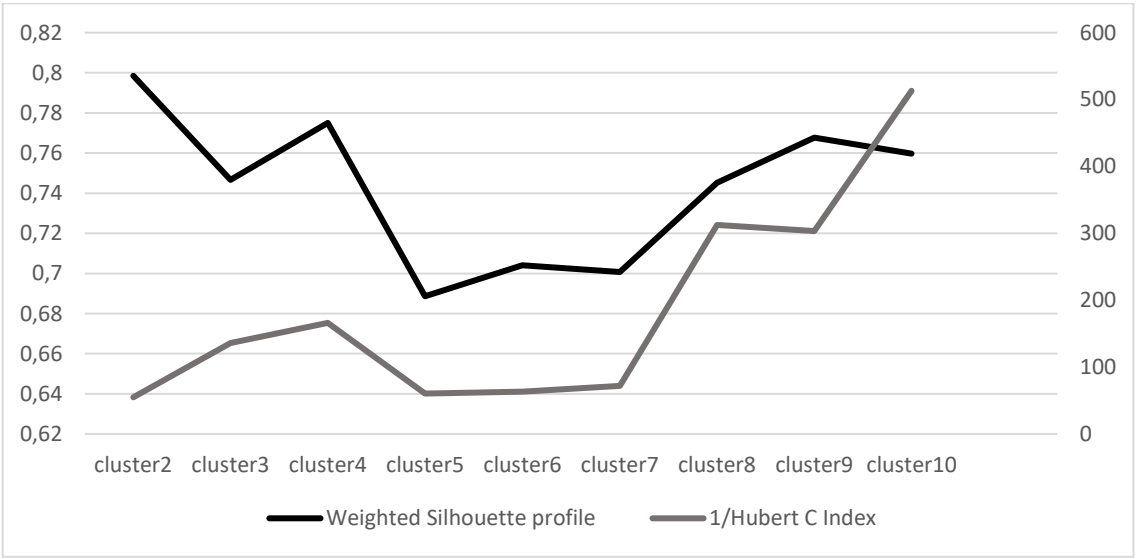
correlation, 1 means perfect positive correlation and 0 means independence. Usually, absolute values greater than 0.7 are considered "strong" and absolute values between 0.3 and 0.7 are considered "moderate". All the other values (different from zero) are considered "weak". We choose to focus on the gross correlation instead of the net correlation (e.g. as given by beta regression values) and to avoid techniques of data reduction applied to the variables (e.g. factor analysis). These choices are made to adopt a purely descriptive (and not inferential) analysis. Our question is not if a specific independent variable (one of the variables introduced before) causes our dependent variable (the propensity to be included in a determinate cluster). Our question is if the correlation between a specific descriptive variable and a cluster propensity exists. In a descriptive perspective, the causal mechanism behind the correlation is only marginal and gross effects are more important than net ones.

3.5 Defining of our typology

Cluster identification

We apply cluster analysis considering the 26 Swiss cantons as units and a wide set of variables referring to cantonal labor markets and economies (see section 4.1) to define the clusters.
Starting from the distance matrix, we calculate the weighted Silhouette profile and the Hubert C index trend. Both these measures reveal a fist optimization point (i.e. a local maximum) in 4 clusters.

Graph 3.1 - Weighted Silhouette profile (left-hand scale) and Hubert C Index (right-hand scale) trends



Following these indications, we define the propensity of each canton to be part of each of these four clusters. Results are summarized in Table 3.3. The last column on the right defines the cluster

membership according to a threshold of 50%. It means that each cluster collects all the cantons that have a probability of 50% or more to be included. Only Zug fails to meet this threshold for all the clusters. It is, thus, recorded as an outlier.

Table 3.3 - Propensity of each canton to be part of the four defined clusters

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster attribution
Aargau (AG)	12.7%	83.0%	1.2%	3.2%	**2**
Appenzell Inn. (AI)	78.0%	15.1%	2.1%	4.7%	**1**
Appenzell Aus. (AR)	73.8%	17.6%	2.7%	5.9%	**1**
Bern (BE)	6.6%	90.3%	0.8%	2.4%	**2**
Basel-Land. (BL)	12.8%	78.9%	2.0%	6.3%	**2**
Basel-Stadt (BS)	0.3%	0.3%	98.8%	0.6%	**3**
Fribourg (FR)	76.7%	15.9%	2.3%	5.1%	**1**
Geneva (GE)	3.7%	4.9%	3.8%	87.6%	**4**
Glarus (GL)	74.4%	20.5%	1.5%	3.6%	**1**
Graubünden (GR)	62.0%	31.5%	1.9%	4.7%	**1**
Jura (JU)	84.8%	11.6%	1.1%	2.5%	**1**
Luzern (LU)	51.6%	41.0%	2.1%	5.3%	**1**
Neuchâtel (NE)	14.8%	74.7%	2.5%	8.0%	**2**
Nidwalden (NW)	71.1%	23.4%	1.6%	3.9%	**1**
Obwalden (OW)	77.8%	17.6%	1.3%	3.3%	**1**
St. Gallen (SG)	9.7%	86.7%	0.9%	2.6%	**2**
Schaffhausen (SH)	21.4%	50.6%	5.8%	22.2%	**2**
Solothurn (SO)	59.3%	33.9%	1.9%	4.9%	**1**
Schwyz (SZ)	86.2%	10.1%	1.1%	2.6%	**1**
Thurgau (TG)	85.5%	11.0%	1.0%	2.4%	**1**
Ticino (TI)	6.3%	91.1%	0.7%	1.9%	**2**
Uri (UR)	71.8%	18.8%	3.0%	6.4%	**1**
Vaud (VD)	5.8%	91.6%	0.7%	1.9%	**2**
Valais (VS)	85.5%	10.5%	1.2%	2.8%	**1**
Zug (ZG)	11.3%	13.7%	29.2%	45.8%	**Outlier**
Zürich (ZH)	10.8%	16.2%	6.5%	66.5%	**4**

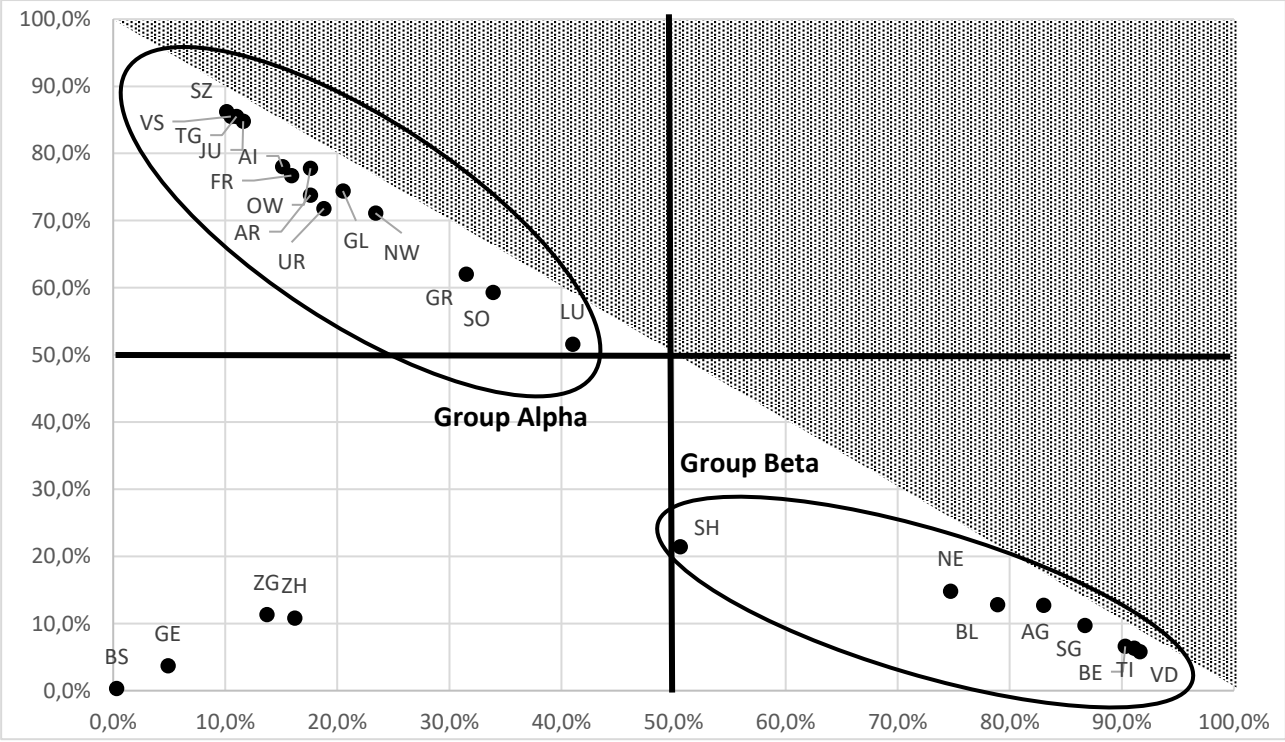
In table 3.3, we observe that clusters 1 and 2 collect the vast majority of the cantons while cluster 3 only includes Basel-Stadt and cluster 4 only includes two cantons, Geneva and Zurich. On a strictly technical level, Zug is the only outlier. Nevertheless, clusters 3 and 4 are so small that the cantons that they include are, as well, isolated from all the others. Even if, on the technical level, they are not "outliers", each of them represents a unique situation in the Swiss context. We, therefore, decide to

keep clusters 1 and 2 while grouping the remaining four cantons in a common group of "unique cases". The consequence of this operation is the following typology:

- Group Alpha collects the cantons with a high probability to be included in cluster 1
- Group Beta collects the cantons with a high probability to be included in cluster 2
- The remaining four cantons are unique cases that are discussed separately

Graph 3.2 summarizes the clusters considering the new structuration. The Y-axis indicates the probability to be included in cluster 1 while the X-axis reports the probability to be included in cluster 2. There are three points of attraction. (a) The upper-left corner, i.e. the "center" of cluster 1. On the graph, this position indicates a hypothetical situation showing a probability of 100% to be included in cluster 1. (b) The lower-right corner, i.e. the "center" of cluster 2. On the graph, this position indicates a hypothetical situation showing a probability of 100% to be included in cluster 2. (c) The lower-left corner that indicated a hypothetical situation showing a probability of 0% to be included both in clusters 1 and 2. The thick lines indicate the 50% thresholds.

Graph 3.2 - Group definition according to the propensity to be in cluster 1 and 2



In Graph 3.2, we also observe the internal structure of each group. Some cantons almost perfectly represent the group and can be taken as representatives. They are situated next to the corners. Others are almost outliers and are visualized at the center of the graph. Group Alpha includes 14 cantons mainly from the mountain areas of Switzerland. Four cantons appear to be the most representative of

this group: Schwyz, Valais, Jura, Thurgau. All these cantons have a probability higher than 85% to be included in cluster 1. The other cantons have a lower probability. In particular, Graubünden (62.0%), Solothurn (59.3%) and Luzern (51.6%) fit only marginally in this group. Group Beta collects 8 cantons. Three cantons appear representative of this group: Vaud, Ticino, Bern. All these cantons have a probability higher than 90% to be included in cluster 2. The other cantons have a lower probability. Particularly, Schaffhausen (50.6%) fits only marginally in this group. Referring to the outliers, we use the probabilities to be included in Alpha and Beta to drive the discussion. All the other cantons have a low probability of being included in the two previous groups. This percentage passes from 16.2% (between Zurich and group Beta) to 0.3% (between Basel-Stadt and group Alpha). These values mean that all these cantons are very different from the identified groups. As it is graphically represented in Graph 3.2, they are almost perfectly equidistant from groups Alpha and Beta, and far from both the thresholds. Considering this (technical) characteristic, these cantons are very similar. In addition, a more specific analysis stresses that all these cantons have a similar urban structure. In particular, they are all strictly connected to metropolitan areas (including Zug, which is almost entirely comprised of Zurich's urban area). Therefore, we decide to organize the discussion of these cantons starting from a general description of them, as if they would belong to a single group (Gamma) and, then, stressing the differences (when present). A final remark is about the complete independence of our typology from other territorial divisions based on cultural (e.g. linguistic or religion areas) or demographic variables (e.g. European NUTS areas) that are currently used in the literature.

Sensitivity tests

In the first test, we try to replicate our results by maintaining the procedure we use in the previous sections. The only element that changes is the calculation of distances. Using the Manhattan distances (Krause 1986), we define the probability of each cluster to be part of the four clusters we have identified in the previous section. If we calculate the Pearson correlation between the probability defined using Euclidean distances (table 3.3) and the probability defined using the Manhattan distances, we have a perfect correlation. The same result is achieved calculating the Pearson correlations between the probability defined using Euclidean distances (table 3.3) and the probability defined using squared Euclidean distances.

In the second test, we use the C-means algorithm (Bezdek 1981) to calculate the probability of each cluster to be part of the four clusters we have identified in the previous section. If we calculate the Pearson correlation between the probability defined using the Fanny algorithm (Euclidean distances)

and the C-means algorithm, we have the following results: 0.996 for cluster 1, 0.983 for cluster 2, 0.999 for cluster 3, and 0.985 for cluster 4. As it refers to Zug, the only outlier in our results, the C-means procedures these probabilities: 4.6% for cluster 1, 7.1% for cluster 2, 26.1% for cluster 3, and 62.2% for cluster 4. If we would have used the threshold of 50% on these probabilities, we would have categorized Zug as a member of cluster 3 together with Zürich and Geneva. Even if this is a difference from our results, it supports our choice to discuss Zug, Zürich and Geneva, as well as Basel-Stadt, separately from the two main groups.

In the third test, we compared the results obtained using the Fanny clustering, and described in table 3.3, with the results obtained using a robust procedure based on Ward/PAM hard clustering (Studer 2013). Few preliminary operations are necessary before this comparison. First, we remove the threshold of 50%. Then, we use the highest probability recorded by each canton to decide in which cluster it has to be assigned. This operation eliminates the outliers. Therefore, the canton of Zug is grouped in cluster 4 as we observe that the propensity to be included in this cluster is the highest for this canton. This operation makes it possible to compare our output with the output of the Ward/PAM clustering as this last technique does not accept outliers. The test reveals a perfect correspondence between the outputs given by our procedure (with Zug in cluster 4) and the output given by the Ward/PAM clustering. This result supports the robustness of our procedure and underlines the advantages to use it. Using a fuzzy clustering, we can easily identify the outliers, and describe the "position" of every canton inside the clusters. For example, the canton of Ticino is very well integrated in cluster 2 (91.1%), while Schaffhausen is only marginally part of this cluster (50.6%).

Variables incidence in the groups

Our description relies on the analysis of the distribution of the variables used to define the clusters. This analysis links each group to a set of socio-economic and labor market characteristics allowing their description. As all the variables involved are fully numerical, we can calculate the correlation between the propensity to be included in a group and the incidence of the variables used to build them. This information gives us the incidence of each variable inside each group. Strong effects (≥ 0.7) have a gray background and are in bold, moderate effects (≥ 0.3) are in bold only.

Table 3.4 - Correlation between groups and defining factors

	Group Alpha	Group Beta	Group Gamma
Gross Domestic Product (GDP) per capita	**-0.65**	-0.15	**0.91**
GDP variance	-0.10	0.16	-0.06
Gini Index	-0.16	-0.24	**0.44**
Correlation between national and cantonal GDP	-0.29	**0.30**	0.00
Small and Medium Enterprises (SMEs) presence	**0.56**	0.03	**-0.67**
High-tech enterprises presence	**-0.71**	0.03	**0.78**
Tax pressure	**-0.34**	0.26	0.11
Unemployment rate	**-0.53**	0.24	**0.35**
Young unemployment rate	**-0.53**	0.27	**0.32**
Long-time unemployment rate	**-0.51**	0.28	0.28
Women presence in the workforce	**-0.38**	-0.06	**0.50**
Cross-border workers in the workforce	**-0.50**	0.07	**0.50**
Cantonal labor market attractiveness for commuters	**-0.60**	-0.12	**0.82**

A general view on Table 3.4 shows how all the variables record at the minimum moderate correlations with, at least one of the groups, except from GDP variance. Groups Alpha and Gamma are opposed. They never have a significant coefficient with the same sign. If the coefficient in group Alpha is positive, its corresponding coefficient in group Gamma is negative, and vice-versa. The group Beta appears to be intermediate between the former two. Due to this intermediate position, the group Beta records a single moderate effect referring to the correlation between national and cantonal GDP. Nevertheless, the coefficient referring to long-term and young unemployment rates is just below the threshold to be a moderate effect and can be discussed as marginally relevant.

Organization and interpretation of the groups

Starting from the elements introduced in the last section, we propose an interpretation of the three identified groups:

- Group Alpha is composed of marginal labor markets. These cantons have poor economies (for Swiss standards) with a weak relation with the national economic trend. The labor market is mainly based on small and medium enterprises active in low-technology sectors. These cantons are weakly attractive: they record a high number of outgoing commuters and a low number of incoming commuters. Among the 14 cantons of this group, none of them have more incoming commuters than outgoing commuters. Unemployment is low or very low in all its components (general, young and long-term), and workforce records a low presence of women and cross-border workers. The representative cantons are Schwyz, Valais, Jura and Thurgau. For example, the canton of Schwyz records the second least attractive labor market

and the second highest presence of small and medium enterprises (97%). Unemployment is very low (1.6%) and cross-border workers are almost completely absent (0.1%).

- Group Beta includes multicenter labor markets. The interpretation of this group is slightly trickier as it records almost only weak correlations with the considered variables. This situation is also due to the intermediate position of this group with reference to the other two groups of our typology. The economy of these cantons is the most connected with the national one. These cantons have a very complex and differentiated economic fabric that includes enterprises focused on international, national and local markets. This structure is the most sensitive to changes in the national economy. On one side, the presence of enterprises centered on international markets is not enough to protect the cantonal economy from national fluctuations given by changes in consumption habits or new economic policies. On the other, medium and large enterprises cannot only rely on local consumers and need a national market to prosper. In addition to these elements, cantons in this group have a marginal propensity to have high values of unemployment and tax pressure. The distribution of wealth in these cantons is also the most egalitarian, but with very low differences with the cantons in group Alpha. The representative cantons are Vaud and Ticino. These cantons are relatively vast areas with multiple attractive centers: Lausanne, Vevey, Nyon, and others for Vaud; Lugano, Chiasso, Bellinzona, and others for Ticino. For example, the correlation between Vaud and Swiss GDP trends is 0.91, next to a perfect correlation. In addition, Vaud has the highest index of tax pressure and the third highest rate of unemployment (4.6%).
- Group Gamma includes only cantons that coincide with metropolitan areas. These areas are very attractive labor markets. Each of these cantons is a unique situation in the Swiss context. The comparison among these clusters shows that Geneva and Basel-Stadt are very similar, while Zurich and, especially, Zug record few differences. For example, cross-border workers are largely present in Geneva and Basel, while much less in Zurich and Zug. Also, the unemployment rate and the index recording the presence of innovative enterprises have medium values for Zug, while it is high for the other three cantons. Nevertheless, our results also show that they share some important characteristics, and, to some extent, can be discussed together. All these cantons have rich, less egalitarian, and attractive economies that are largely independent from the national context. They occupy the first four places if we rank the cantons by GDP per capita, and are the only areas to have a difference between incoming and outgoing workers that is largely positive. Large enterprises are almost twice as present in this group than in the rest of the country (23.1% against 12.7%) and the index describing the presence of high-tech companies has very high values (except for Zug, which has medium values).

3.6 An empirical test of our typology

Aims

In this section, we have a threefold aim: (a) performing a simple test of the heuristic power of our typology, (b) showing an example of an empirical study that can profit from our typology, and (c) comparing our typology with other possible divisions of the labor market. In this empirical test, we study a subject related with economic and labor market dynamics, i.e. workers moving to another canton to start a new job[13]. We show how our typology can be used to create hypotheses starting from the characteristic of each group and be transformed in a variable that can be easily included in a statistical analysis. Using the characteristics of the three types of labor markets described by our typology, we delineate two main hypotheses. The first hypothesis refers to the general job-related relocations. We expect many workers to move to the cantons defined as "attractive labor markets" and only a few workers to move away from these cantons. We expect an opposite trend for "marginal labor markets": few incoming workers and many outgoing workers. Finally, we expect "multicenter labor markets" to have intermediate characteristics with respect to "attractive labor markets" and "marginal labor markets". Consequently, we imagine "multicenter labor markets" to record an incoming and outgoing flow of workers with comparable sizes. The second hypothesis refers to workers' jobs positions. We expect "attractive labor markets" to mainly attract workers in upper-level jobs and "marginal labor markets" to attract workers employed in elementary occupations. Once again, we expect "multicenter labor markets" to be in an intermediate position.

These hypotheses are based on the characteristics of the three types of labor markets described by our typology; consequently, if our data support them, they also provide a simple confirmation of the heuristic power of our typology.

Finally, we describe the workers moving to another canton to start a new job using, as a reference, two other typologies vastly used (e.g. Bertschy et al., 2014; Feld and Savioz, 2000; Lebert, 2014; Sacchi and Meyer, 2016; Wernli and Henchoz, 2015): the NUTS areas and the linguistic areas of Switzerland. We described and discussed the NUTS area in section 3.3. As it refers to linguistic areas, we split the Swiss territory in four groups: cantons with a population that mostly speaks German (Aargau, Appenzell Innerrhoden, Appenzell Ausserrhoden, Bern, Basel-Landschaft, Basel-Stadt,

[13] We stress that these job-related relocations differ from both national commuters (cantonal labor market attractiveness for commuters) and cross-border workers in the workforce. Even if these measures are probably correlated, they are different as neither commuters nor cross-border workers change their residence and move in the canton where they work. Consequently, the number of job-related relocations is independent from the definition of our typology.

Glarus, Luzern, Obwalden, Nidwalden, St. Gallen, Schaffhausen, Solothurn, Schwyz, Thurgau, Uri, Zug, Zürich), cantons with a population that mostly speaks French (Geneva, Jura, Vaud), cantons with a population that mostly speaks Italian (Ticino), and cantons with two or more languages that are official or largely spoken among the population (Fribourg, Graubünden, Neuchâtel, Valais).
The described operations cannot be considered an empirical validation. A true validation can be achieved only using our typology for further empirical studies. Only when it will be successfully used to achieve scientific results, the validity of the typology would be definitely established. Nevertheless, this section shows some strong points of our typology over others, and shows how it can be used as a research tool.

Data and variables used for the test

We use data coming from the calendar questionnaire of the first wave of the third sample (SHP III) included in the Swiss Household Panel (Voorpostel et al. 2015). These data do not provide individuals' work addresses. Nevertheless, unlike other data, the Swiss Household Panel is not used to create official statistics of the workforce that we have used to define our typology. We, thus, avoid the risk of endogeneity. Given the limited information on individuals' places of work, we include in our sample only the workers who indicate simultaneously a change of residence and work status in the 2000-2012 period. People coming from abroad or moving abroad are not included in the sample. We measure the residence at the cantonal level and the work status using the International Standard Classification of Occupations (4-digit ISCO-88) codes. We consider work-to-work or inactivity-to-work transitions, but not work-to-inactivity transitions. The size of our sample is 84 units, weighted according to the longitudinal weights provided by the Swiss Household Panel (Voorpostel, et al. 2014). In order to calculate the transitions among the types of our typology (and, similarly, when the linguistic areas are used), the weights are corrected to compensate for the geographic distribution of the population that, in the Swiss Household Panel, are based on the NUTS areas (see section 3.3). Obviously, when the NUTS areas are used to describe the workers moving to another canton to start a new job, no correction is needed. The size of our sample is very small due to the very conservative measure that we are obliged to adopt to measure job-related relocation. Consequently, we restrain our analysis to tabulations that include no more than three variables, and we use large categories to measure socio-demographic characteristics.
In the analytical part, we include three socio-demographic variables to test our hypotheses: sex, age, job position (before and after the relocation). Sex is simply coded as men and women, while age is divided in classes. We recode individual age in three classes: 25 or below, 26-39 years old, 40 or

more. The categories roughly divide workers in the beginning of their occupational career, workers in the period of work stabilization, and workers in the second and, usually, more stable part of their career. When it comes to job positions, we recode the International Standard Classification of Occupations (1-digit ISCO-88 codes) in a three-level definition of the work position. In this last part of the analysis, a very thin granularity of the measure would make the results less clear due to the elevated number of possible occupations. Our classification of the job positions includes:

- "Upper-level jobs" i.e. "Legislators, senior officials, and managers" and "Professionals"
- "Medium level jobs" i.e. "Technicians and associate professionals", "Clerks", "Service workers and shop and market sales workers", "Skilled agricultural and fishery workers", "Craft and related trades workers", and "Plant and machine operators and assemblers"
- "Elementary occupations" i.e. the equivalent ISCO category

Worker flows among the groups

Our first hypothesis refers to the general flow of job-related relocations, and links it to the characteristics of cantonal labor markets as described by our typology. We expect a large part of workers to move toward "attractive labor markets", and away from "marginal labor markets". "Multicenter labor markets" should be in an intermediate position. Table 3.5 shows the subdivision of incoming and outgoing workers referring to the groups of our typology.

Table 3.5 - Incoming and outgoing workers per labor market type

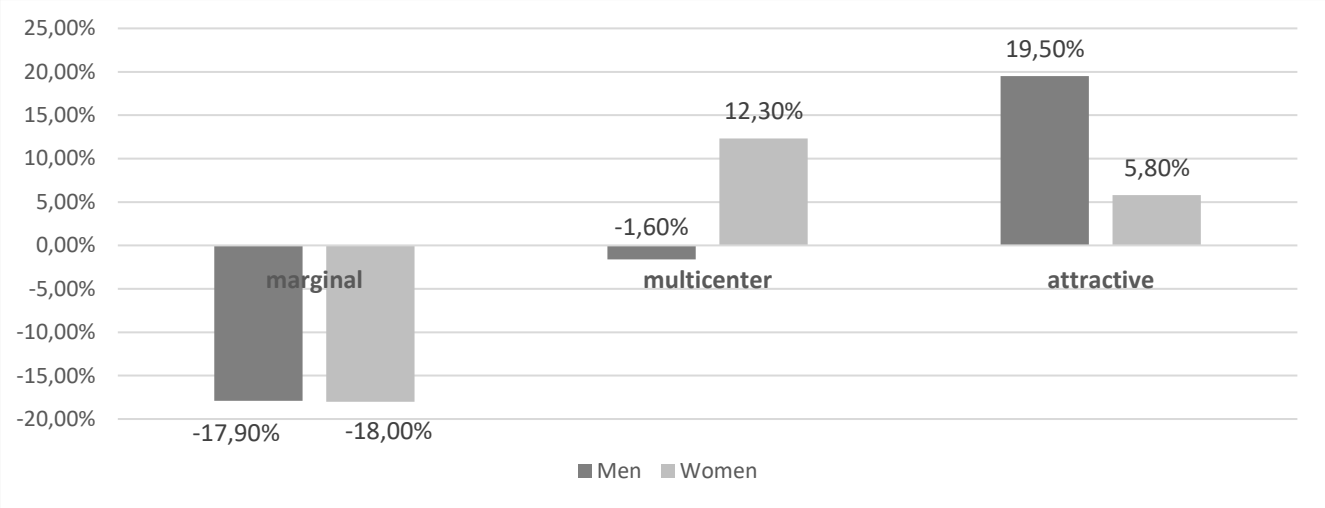
	Incoming	Stable	Outgoing	Net flow (incoming – outgoing), in percentage points
Marginal labor markets	11.6%	10.3%	29.5%	-17.9
Multicenter labor markets	29.9%	17.4%	25.0%	4.9
Attractive labor markets	28.4%	2.5%	15.3%	13.1
	n=84	n=26 (out of 84)	n=84	

Table 3.5 reveals that both "attractive" and "multicenter" labor markets attract workers from other labor markets. They include, respectively, shares of 28.4% and 29.9% of our sample. Nevertheless, in multicenter labor markets, this flow is counterbalanced by an almost equally strong amount of people leaving this labor market (25.0%). Consequently, we observe multicenter labor markets to be a fluid area with many workers moving to and from these cantons, while attractive labor markets appear to be an area of strong attraction (net flow +13.1). Marginal labor markets are in the opposite situation. These areas attire only 11.6% of the sample while almost 30% of the outgoing workers

come from them. All these observations support our hypothesis and are in line with the characteristics of each type of labor market.

In order to test the robustness of these observations, we introduce two control variables: sex and age. Table 3.6 shows the distribution of the workers according to sex and labor market type.

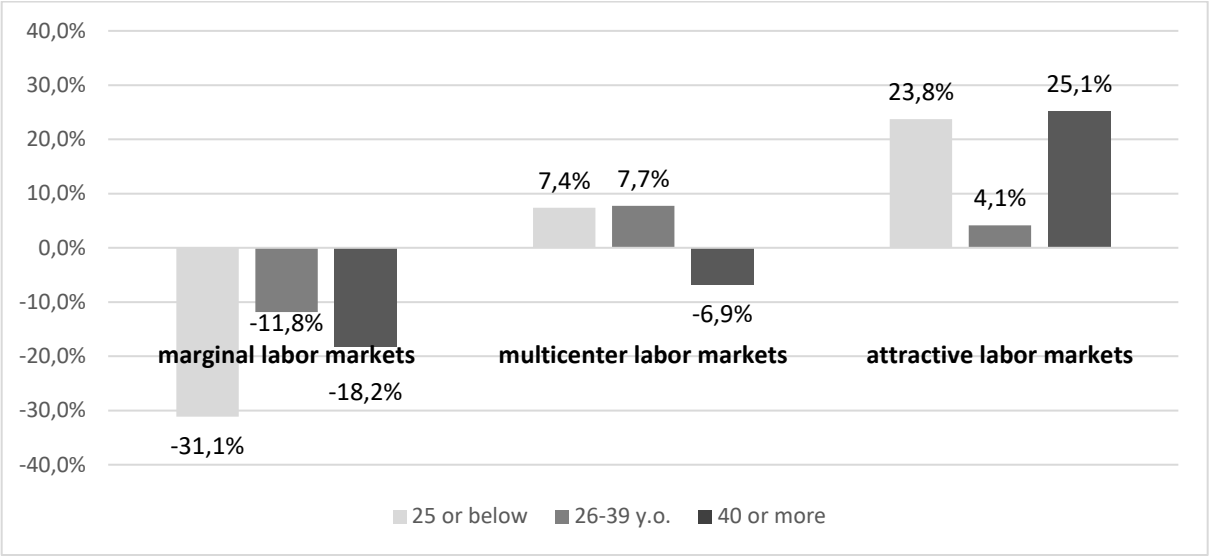
Graph 3.3 - Net flows (incoming – outgoing) workers per labor market type and sex



These new results do not change the pattern observed in the general data. Marginal labor markets have negative net flows both for men and women (i.e. more outgoing workers then incoming workers). Attractive labor markets are in the opposite situation, even if the size of the net flow is far stronger for men. The only group that has a slightly peculiar pattern is "multicenter labor markets" that appears to be very attractive for women while balanced for men.

Referring to workers' ages, the first observation is that our sample is not equally distributed among the categories. The majority of workers are collected from the 26-39 category (N=44). Young workers (25 years old or younger) and workers in the second part of their career (40 years or older) are less present in our sample (respectively N=23 and N=17). Graph 3.3 shows the net flows of workers according to age classes and labor market type.

Graph 3.4 – Net flows (incoming – outgoing) workers per labor market type and age

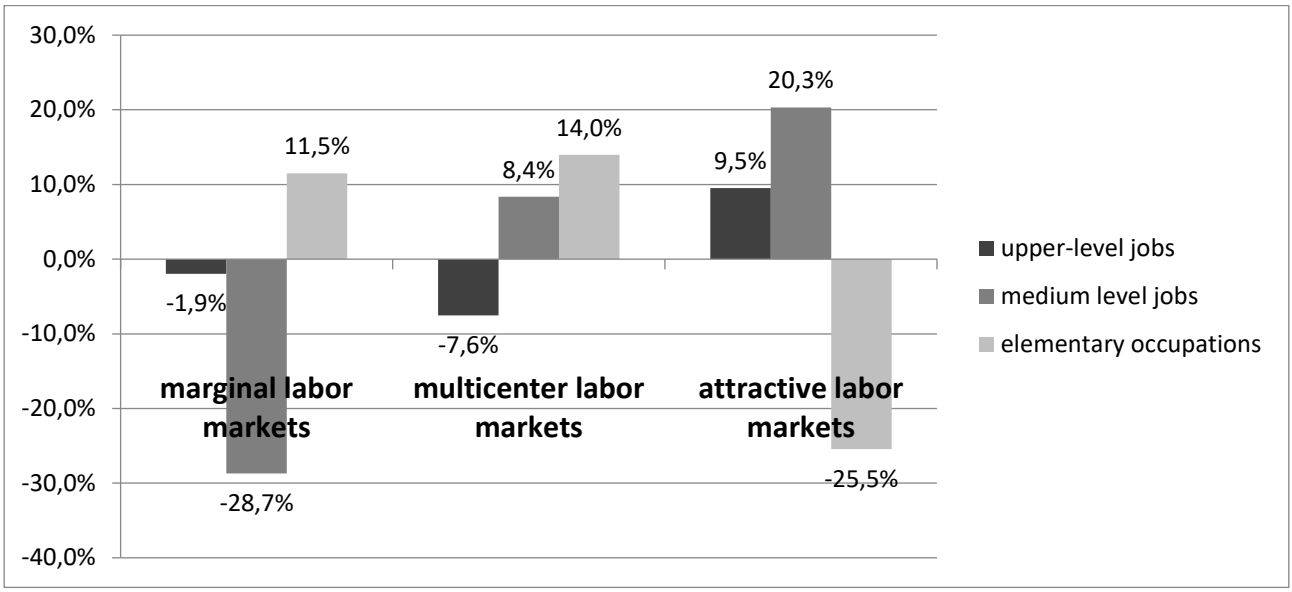


The type of labor market seems to drive the workers' flows more than the age classes confirming the results observed on the general sample. Marginal labor markets have negative flows (i.e. more outgoing workers than incoming workers) while attractive labor markets have positive flows. Multicenter labor markets have both positive and negative values but always moderated. The only category that has a value partially different from what expected is the 26-39 years old category for the attractive labor markets. This category has a value of +4.1 percentage points. This effect is positive (as expected) but has a size lower than expected, especially if we consider that the effects for the other age categories are beyond 20 percentage points.

Workers relocations and individual job positions after the relocation

Our second hypothesis was related to the job position after relocation and is connected to the characteristics of each type of labor market described in our typology. We expect "attractive labor market" to mainly attract workers in upper-level jobs, "marginal labor markets" to attract workers employed in elementary occupations, and "multicenter labor markets" to be in an intermediate position. To test this hypothesis, we compare individual job positions after the residence change.
Graph 3.4 describes the flow of workers that change residence and job position at the same time split according to the job type after the residence change. For this analysis, we have to exclude two cases that transited to a low-hours part-time position that are hard to place in a socio-occupational scale.

Graph 3.5 - Net flows (incoming – outgoing) workers per labor market type and job type



Coherently with our hypotheses, attractive labor markets are the only group in which we observe more incoming workers than outgoing workers for workers in upper-level jobs. They also strongly attract workers in medium-level jobs while workers in elementary occupations largely leave these areas. Marginal labor markets are in the opposite situation. Only workers in elementary occupations have a positive net flow. Again, this is consistent with the characteristics of these labor markets and support our hypotheses. Finally, multicenter labor markets are, once more, in an intermediate position. They attract mainly workers in medium and elementary occupations.

Using NUTS and linguistic areas

In this section, we analyze the workers' flow among NUTS and linguistic areas. Starting from the NUTS areas, we observe (table 3.6) that Zurich, Ticino, and the Mittelland area attract workers from other areas, especially from Eastern, Central, and Northwestern Switzerland, which appear to be the largest sources of workers.

Table 3.6 - Incoming and outgoing workers per labor market type

	Incoming	Stable	Outgoing	Net flow (incoming – outgoing), in percentage points
Lake Geneva region	12,0%	18,0%	11,7%	0,3
Mittelland	23,5%	33,1%	18,4%	5,1
Northwestern Switzerland	14,7%	5,3%	19,2%	-4,5
Zurich	17,8%	0,0%	10,5%	7,4
Eastern Switzerland	15,3%	18,8%	24,2%	-8,9
Central Switzerland	10,2%	24,8%	15,4%	-5,3
Ticino	6,6%	0,0%	0,6%	5,9
	n=84	n=18 (out of 84)	n=84	

The main criterion behind the definition of this typology is the population size of each area; consequently, it is hard to discuss these results. We can only hypothesize that, given a roughly similar population size, some areas are more attractive due to territorial characteristics. Nevertheless, these characteristics are not included in the definition of the typology; therefore, further analyses are needed to unveil them. At most, Zurich and Ticino could be discussed more in detail as these two cantons forms two NUTS areas. Contrarily, the other areas are not homogeneous at the economic and labor market level. For example, the Northwestern Switzerland group includes the cantons of Basel-Land (which is strongly attractive, with a dynamic labor market, and a high presence of large and high-tech enterprises), and Basel-Stadt, or Aargau, which are cantons that are much less attractive and with mainly national-based economies. Without the introduction of further variables and further analyses, the typology itself give no information on these areas.

As it refers to the linguistic areas, table 3.7 shows the flow of job-related relocations among German-speaking, French-speaking, Italian-speaking, and multilingual cantons.

Table 3.7 - Incoming and outgoing workers per labor market type

	Incoming	Stable	Outgoing	Net flow (incoming – outgoing), in percentage points
German-speaking	72,8%	92,4%	81,1%	-8,3
French-speaking	9,0%	4,0%	6,5%	2,5
Italian-speaking	9,3%	0,0%	0,3%	9,0
Multilingual	9,0%	3,7%	12,2%	-3,2
	n=84	n=59 (out of 84)	n=84	

The Italian-speaking area[14] seems to be the most attractive followed by the French-speaking area, while the German-speaking and the multilingual areas seems to be poorly attractive areas. Nevertheless, this interpretation is not robust due to the structure of the typology. The German-speaking area covers the majority of the population (69%) and the cantons (18 out of 26), while the other three groups cover the rest of the population. As a consequence, the vast majority of the changes (89%) are either completely included in this area, or have the starting or ending point in this area. The types of this typology are strongly unbalanced (from a numeric point of view) and the use of a strongly unbalanced typology does not always return robust results. Nevertheless, the main issue connected with this typology is the connection between the language spoken and the attractiveness of the labor market. Cultural elements can be discussed but they are not included in the typology, and consequently, we need further analyses. The linguistic division, in itself, of Switzerland brings little added value to the analysis of socio-economic and labor market studies.

An overview on workers flows between labor market types

In this last section of our empirical test, we sum up and combine our results. We introduce three points. First, we discuss what the results on the individual level illustrate with respect to our hypotheses (see the section 3.6 - Aims) and, consequently, the description of the typology we defined after a macro-level analysis. Second, we present the new elements coming from the analysis on workers' flows in the identified types of labor market. Third, we describe the added value of our typology in comparison with the other two typologies used to study job-related relocations (Swiss NUTS and linguistic areas).

Generally speaking, the analysis of workers' flows across the three types of labor markets supports our hypotheses and the description of our typology. We described "marginal labor markets" as a source of workers for other areas and with an economy based on local markets and low added value companies. In line with this description, this is the only group with a higher incoming than outgoing share of workers. The only workers who seem to be significantly attracted by this type of labor market are people moving in elementary occupations, coherently with the economic structure of these areas. Attractive labor markets, on the other side of the spectrum, are an attraction point for workers, in general, and for workers who refer to international and/or high-tech companies, in particular. They

[14] As showed in section 3.3, this area includes only the canton Ticino. Nevertheless, the values are different from what is reported in table 3.5 and referred to this canton. This is only an apparent incoherence. The percentage of the incoming and outgoing changes are calculated on the total changes among the groups defined by the typology. The number of incoming and outgoing workers in Ticino is the same in table 3.5 and 3.6, nevertheless, the total number of relocations changes in the two tables and, consequently, the share of Ticino-related relocations on the total changes.

have a dynamic labor market with international connections and a strong presence of new sectors of economy and business. Our data are in line with this description. The difference between incoming and outgoing workers is largely positive, even if the level of incoming workers is slightly lower than what expected. In addition, this group strongly attracts workers in medium and high-qualified job positions. Finally, we expected "multicenter labor markets" to be in an intermediate position. Once again, our data confirm this description. The amount of incoming and outgoing workers is very similar in this group and these labor markets mainly attract medium and low-qualified workers. As a final remark, we can stress that in all the analyzed labor market types, the effects of other socio-demographic characteristics seem to be largely driven by the labor market type. This result shows the robustness of our typology against the influence of other factors, notably sex and age.

In addition to be a test for our typology, our individual-level analysis brings also new elements. In particular, the analysis of multicenter labor markets provides interesting results. Probably, the intermediate position (inside our typology) of multicenter labor markets hides most of its features to a macro-level analysis. From the simple description of our typology, we can hypothesize that multicenter labor markets are expected to have a similar amount of incoming and outgoing workers. This is consistent both with a low level of incoming and outgoing workers and a high level of both these values. According to our analysis of the Swiss Household Panel, multicenter labor markets appear to be a very fluid territorial context with many incoming and many outgoing workers. This result provides new elements to describe the movement of workers on the Swiss territory and can be a cue for further researches. The analysis of age effects gives us another new element. Even if age effects seem to be marginal, the size of the age groups provide pieces of information on the workers that have a job-related relocation. As it was foreseeable, individuals in middle adulthood (26-39 years old) are the lion's share of the workers that change job position and canton of residence at the same time. Probably, these workers are more mobile as they have already a stronger base for their career (given by a longer education or job tenure) that helps them to gain a position in an unknown labor market. At the same time, these workers are still young and, consequently, more prone to territorial mobility than older workers that are more deeply bound to specific social networks.

Finally, the comparison with NUTS and linguistic areas shows that our typology brings an added value to socio-economics and labor market analysis without the introduction of further variable and analyses. Both NUTS and linguistic areas show that some regions are more attractive than others nevertheless they give no elements to understand why the attractiveness change among the identified areas. Without the introduction of further variables, we have no elements to understand if these differences have structural causes or are the consequence of a coincidence. Differently, our typology has inherent elements that show the structural causes of the observed flow of workers.

In conclusion, we can affirm that the simple test we have just introduced provide an exploratory support to the validity of our typology and shows how it can be easily introduced in a study of labor market and economic issues. Using our typology can allow researchers to better understand regional differences on the Swiss labor market and propose new interpretative frames. What we showed is just an example of a labor market study that could benefit from out typologies. Similar analyses can be done on the transition from school to work, the study of the causes that bring to quit the labor market, and many other issues. All these analyses can be framed in our typology connecting individual life trajectories in a socio-economic context that have an influence that can be described using the characteristics of the three types defined in this chapter.

3.7 Conclusion

Switzerland is a complex territorial context. The historical formation of the nation is made of successive aggregations of small territories that gave birth to a highly decentered institutional structure composed by 26 cantons. Given the high number of cantons and the small size of many of them, the use of cantons as territorial units in the empirical analysis can create problems to sample-based analyses. Many samples are too small in size to include a sufficient number of units to support a robust analysis that includes all the cantons. As a consequence, many researchers prefer using more parsimonious typologies. The most frequently used typologies are the Swiss Vast Regions and the Swiss linguistic areas. Despite their large use, these typologies bring a low added value to socio-economic and labor market studies as they rely on factors that are only partially related with the economic fabric of the Swiss regions. Other typologies based on economic factors (Battaglini et Giraud 2003; Flückiger et al. 2006) are either constructed on few variables or do not cover the entire Swiss territory. In this study, we proposed a new typology based on a large set of variables that refer to economic and labor market characteristics of each canton. We use cluster analysis to aggregate the cantons and Pearson's correlation index to describe the resulting clusters. Our typology defines three groups:

- Group Alpha, which includes *marginal* labor markets. This group contains 14 cantons and collects local-based economies that are poorly attractive for workers of other territories (in Switzerland or abroad).
- Group Beta, which includes *multicenter* labor markets. This group contains 8 cantons that have a relatively large urbanized territory with many attractive areas (usually the biggest cities). The compresence of territories with different economic structures produces a general situation that is intermediate between the other two groups.

- Group Gamma, which includes highly *attractive* metropolitan labor markets. This group is substantially quite homogeneous as it collects 4 cantons corresponding to 3 large Swiss urban areas. These labor markets have only marginal boundaries with the local economy due to the presence of international and high-tech companies. They strongly attract commuters from the other cantons and, in some cases, the nearby European regions.

Each group represents a context with consistent socio-economic characteristics that can be used as explanatory or control variable in researches that aim to consider the general differences in Swiss labor markets. To give an example of its use, and to perform a simple test of its validity, we use data from the Swiss Household Panel to analyze the flows of workers moving to another canton to start a new job. Our results show how the characteristics of our typology can provide elements useful to explain this phenomenon. As we have shown in section 3.6, job-related mobility of workers in different job positions can be partially explained by the regional differences in the Swiss labor market as they are described in our typology. This result is robust to the induction of sex and age in the analyses, and becomes more precise when we consider workers' job positions. Coherently with the characteristics of our typology, attractive labor markets attire mainly highly qualified workers, marginal labor markets are weakly attractive except for low qualified workers, and multicenter labor markets have balanced flows of workers in all the categories.

These results show just one simple application of our typology. More generally, a vast set of socio-economic and labor market researches can benefit from it. The most used typologies that describe the Swiss territory only marginally connect with the regional economic structure. In reverse, our typology provides a description of the economic fabric of each region that can bring a substantive added value to the results. In addition, our test illustrates how our typology can be easily applied in other studies. The variable that describes our typology can be easily included in a descriptive analysis, in a regression model, and in many other empirical approaches, also in presence of small samples. Differently from cantons, that are numerous and very diverse in size, our typology has a parsimonious structure composed by only three groups that refer to three large shares of the Swiss population.

Given these elements, we estimate that the proposed typology can become a useful tool for other research and supply to the need of a territorial categorization of Swiss regions according to economic and labor market factors.

CHAPTER 4

Before and after the stork: comparing Canadian and Swiss work-life patterns in a period of parental leave reform

with
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4.1 Introduction

Many countries rely on parental leave policy to provide support for families and increase parents' participation in the labor market. This instrument aims to provide employment protection for mothers and parental leave for caretaking, set a standard for entitlements, and reduce childhood poverty. Yet arising from these common objectives are policy that vary considerably from country to country, influenced by specific welfare and social contexts, including historical and contemporary political mandates and tensions. Among OECD countries, government-paid parental leave ranges from zero weeks in the majority of the United States to over 58 weeks in Bulgaria (OECD 2016). Further, the proportion of earnings replaced by state benefits varies considerably, from 100% in Mexico to 42% in Australia (OECD 2016). The range of policies and their contrasting results sparks ongoing social debate on which characteristics define a "successful" parental policy and, consequently, which direction should take an eventual reform in order to promote the labor market attachment of mothers, re-orientate family work-life strategies, and reduce family poverty and marginalization (Akgunduz and Plantenga 2013; Genre, Salvador, and Lamo 2010; Pettit and Hook 2002).

Our study contributes to this debate by providing a new examination of how parental leave reforms implemented in Switzerland and Canada in the beginning-to-mid 2000s influenced men and women's life course patterns in the four years surrounding childbirth. A Canadian-Swiss comparison is useful for two reasons. *First*, these countries share a number of key similarities, yet differ on other dimensions. Canada is largely classified as a liberal-regime given its market-oriented approach to employment regulation and the provision of childcare (OECD 2013b). Switzerland is harder to situate within labor market typologies, exhibiting elements of social-democratic, conservative and liberal regimes (Bertozzi et al. 2005; Giugni et al. 2014). Nevertheless, Switzerland has a structure of workers' protection that is similar to liberal countries, such as the US and the UK (OECD 2013a), and both countries have high levels of female labour force participation, especially in part-time occupations (Le Goff 2005; ILO 2016). Despite these economical similarities, Canada and Switzerland also have important cultural differences. Given these differences, we expect the impact of parental leave to be dependent upon socially varying attitudes, in line with the results by Budig, Misra, and Boeckmann (2012) that find that motherhood earnings penalties vary in relation to cultural attitudes surrounding women's employment,. *Second*, both Switzerland and Canada underwent a maternity leave reform at the beginning of the 2000s. In both countries, the length of the maternity leave was expanded and a fragmented legislation was unified in a single federal program. As a consequence, we can compare two reforms with similar objectives included in two labor markets with similar characteristics. These similarities make easier the study of the technical aspects of the reforms

(length, amount of monetary benefits, and compulsoriness), the role of the cultural background, and the differentiation of their effects on population subgroups (mothers, fathers, parents at their first, second, or further child).

4.2 Parental leave reforms and employment outcomes

Many nations have recently modified their public parental leave programs with two main objectives: to improve mothers' labor-market attachment after childbirth and to support children's wellbeing and education. This includes Chile in 2011 (Albagli 2011), the state of California (US) in 2004 (Rossin-Slater et al. 2011) France in 2004 (Joseph et al. 2013), Denmark in 2002 (Rasmussen 2010), Austria in 1990 (Danzer and Lavy 2013) Germany in 1979, 1986 and 1992 (Dustmann and Schönberg 2009, 2011) and, earlier, Sweden (Liu and Skans 2009) and Norway in 1977 (Carneiro et al. 2011; Dahl et al. 2013). As discussed next, the efficacy of parental leave reforms on women's employment outcomes is debated, with studies revealing no notable impact in some context and substantial change in others. Furthermore, in some cases, unintended change is found. These prior studies highlight how variability in reform (e.g., leave length or benefit amount) and country contexts can matter.

Among the body of research that fails to find policy reform effects, a range of explanations are offered (Baum 2003; Dustmann and Schönberg 2011; Low and Sanchez-Marcos 2015; Waldfogel 1999). Some scholars point to limitations in leave reforms, in particular, the shortness of the leave available or the low level of monetary benefits mandated. For example, Waldfogel (1999) shows that American mothers' wage profiles were unaffected by the introduction of a twelve-week unpaid leave in 1993, a result is consistent with international comparative studies that reveal the inefficacy of short unpaid parental leaves (Aisenbrey et al. 2009; Akgunduz and Plantenga 2013; Baker and Milligan 2005; Genre et al. 2010; Pettit and Hook 2002; Rønsen and Sundström 2002). Similar results are stressed by Akgunduz and Plantenga (2013) when comparing across a wide range of European countries. The authors find that both a moderate duration (around 28 weeks) and paid leave are necessary to influence work-life norms. Although similar results are found by Genre, Salvador and Lamo (2010) and Pettit and Hook (2002), the best length estimated - respectively, around 40 and 80 weeks - differs. Research that finds parental leave reform has no effect on mothers' labor market status also considers the disconnect between some governmental policy and pre-existing parental employment patterns (Aeppli 2012; Low and Sanchez-Marcos 2015). Policy change is viewed as responding to economic cycles and other historical phenomena rather than to broader underlying forces that drive the social environment. For example, Kahn (2010) compares the effects of institutional change on employment across European countries, largely observing a general inefficacy of national welfare reforms.

Patterns of labor market participation are shown to have considerable inertia, making them difficult to redirect. Similar conclusions are drawn by Bartkiw et al. (2009) in their analysis of Canadian labor market reforms between the end of the 1990s and the beginning of the 2000s. The authors describe how persistent economic and social expectations dilute the efficacy of policy change.

Existing literature has also found that parental leave reform in different policy contexts can have unexpected and unintended effects. For example, Hofferth and Curtin (2006) find that while parental policy change in the United States aimed to increase parents' participation in the labor market, the unintended consequences were a trade-off between flexible employment and lower wages. Lalive and Zweimüller (2009) argue that prolonging the leave available in Austria led to significant reductions in mothers' employment and earnings, although only short-term effects were found. Schönberg and Ludsteck (2014) find corresponding results in Germany. Beyond the effect of policy itself, other research provides evidence that reform functions as a catalyst for institutional and organizational change. For example, Aeppli (2012) highlights how some companies reduced their parental leave programs after the introduction of Swiss federal policy. Even if the introduced norms expanded parental leave on a national level, some individuals received less as companies adjusted their programs to correspond with new national norms.

Notwithstanding the limitations identified by the research discussed above, numerous studies do reveal improvements in mothers' employment and wages dynamics. In the wake of parental leave reform, Rønsen and Sundström (2002) compare the expansion of parental benefits in Finland, Norway and Sweden and find policy change increased employment re-entry rates in all three countries. Nevertheless, the authors state that reform effects were almost exclusive to the period immediately following the end of the leave and were stronger in labor market sectors already relatively family-friendly, notably public administration. Rossin-Slater et al. (2011) find similar results after the introduction of California's Paid Family Leave policy and Spiess and Wrohlich (2008) find the same trend in Germany. In the French context, Joseph et al. (2013) find a small positive effect on labor market participation after the 2004 policy reform. These empirical contributions stress the effectiveness of social policies in shaping mothers' careers (see Hegewisch and Gornick (2012) for a review) and, even influencing cultural norms, such as promoting egalitarian gender values (Bühlmann et al. 2010).

Research continually highlights how different national contexts and the characteristics of any reform lead to different outcomes. Taken together the elements suggested by all the presented researches, a few important observations can be gleaned. First, the *presence of monetary benefits* is a central element for the efficacy of parental leave on labor-market attachment (Akgunduz and Plantenga 2013; Baum 2003; Bergemann and Riphahn 2010; Rossin-Slater et al. 2011; Waldfogel 1998).

Consequently, any reform that does not include the introduction or a significant extension on the amount of paid benefits is less likely to impact mothers' labor-market attachment. The second element to consider is the *length of the parental leave*. As we have already discussed, a number of studies highlight that policy which only provides short parental leave has little-to-no impact on mothers' careers (Aisenbrey et al. 2009; Akgunduz and Plantenga 2013; Baker and Milligan 2005; Genre et al. 2010; Pettit and Hook 2002; Rønsen and Sundström 2002). Third, even with varying lengths, the presence of *mandatory leaves* is also a notable difference (Baker and Milligan 2005; Erosa et al. 2005). Mandatory leaves represent a protection for the employee against the eventual illicit pressures by the employer to reduce the length of the leave and, consequently its protective role. As will be discussed below, these three elements are particularly relevant for our study given that Swiss and Canadian reforms promote different lengths and compulsoriness of supported leave. Finally, a further, non-negligible element to also consider is the socio-economic context around the reform. The presence of family-friendly labor markets and welfare is an essential component for reform that aims to increase parents' participation in the labor market after childbirth (Brehm and Buchholz 2014; Fouarge et al. 2010; Grunow, Hofmeister, and Buchholz 2004; Nielsen, Simonsen, and Verner 2004). In particular, parental rights entitlements (Brugiavini, Pasini, and Trevisan 2013; Burgess et al. 2008) and accessibility and promotion of childcare (Vlasblom and Schippers 2006) play a central role.

4.3 The contexts under analysis: Switzerland and Canada

As briefly discussed in the introduction, the national context in which the Swiss and the Canadian reform occurred is a central element in our study. In particular, the elements that mostly concerns our study are the perception of women's participation in the workforce, the specificity of the national labor markets, and the current legislation about workers protection (with a particular attention to parents' protection).

Table 4.1 Country overview

	Switzerland		Canada	
Parental leave entitlements	*Before*	*After*	*Before*	*After*
Weeks of leave available to mothers	(8)*	16	27	52
Weeks of leave available to fathers	0	0	10	35 (shared)
Percentage of wage replacement	0%**	70%	55%	55%***
Mandatory leave	No	Yes	No	No
Labor market characteristics				
Percentage of female employment part-time, 2015 (ILO 2016)	51.3%		38.2%	
Percentage of male employment part-time, 2015 (ILO 2016)	24.2%		21.7%	
Share of involuntary part-timer females as % of part-time employment, 2015 (OECD 2016)	7.2%		25.3%	
Share of involuntary part-timer male as % of part-time employment, 2015 (OECD 2016)	9.5%		28.0%	
Female share of employment, 2014 (ILO 2016)	46.4%		47.6%	
Beliefs towards the employment of mothers (ISSP 2012)				
Percentage agree mothers should work full-time with a non-school aged child, 2012	3.71%		16.81%	
Percentage agree mothers should work part time with a non-school aged child, 2012	71.65%		49.11%	
Percentage agree mothers should work full time with a school aged child, 2012	11.47%		49.26%	
Percentage agree mothers should work part time with a school aged child, 2012	80.69%		46.51%	

* Regulated by the Labor Law, under the category of worker's impediment without misconduct (such as illness or military service)
** No maternity wage replacement was set, but the norms on worker's impediment without misconduct set wage replacements that strongly varied according to job tenure
* * Wage replacement is 15% higher in the province of Quebec, and higher for low-income families across Canada.

The Swiss economic and labor market context

Switzerland is a federal state divided into 26 largely autonomous regions called cantons. The federation is organized around a parliamentary system with strong elements of direct democracy, including the possibility for a group of citizens to organize a popular initiative or a referendum that can overturn parliamentary decisions. Federal laws often take the form of a broad legal framework that leave room for, sometime very divergent, applications at the cantonal level. This institutional framework has been termed "executive federalism" in prior research on unemployment (Battaglini and Giraud 2003), but the term can be extended to the entire Swiss administrative organization. Switzerland has low levels of economic and labor market regulation and a fluid labor market that echoes more marketized contexts, such as the United Kingdom or the United States (OECD, 2013). These regulations, together with generous unemployment benefits (70% of the salary for 18 months), and a support based on the principles of active labor-market policies (Bonoli, 2010), reveal that Swiss policies are oriented more towards the protection of income rather than the protection of workers' job positions.

Although Swiss female participation in the workforce is among the highest in Europe (Le Goff 2005), the labor market is strongly segmented by gender (Giudici and Gauthier 2009), both in reference to occupational pathways and work time. In Switzerland, the vast majority of male workers are in full-time employment while part-time is largely widespread among women (Goebel and Ehrensperger 2009; Widmer et al. 2003), and "deep-rooted gender stereotypical views on women's lack of work

commitment" (Buchmann et al. 2003) persist. In this context, the birth of a child exacerbates employment gender inequalities (Girardin et al. 2016; Giudici and Gauthier 2009; Le Goff et al. 2009; Swiss Federal Statistical Office 2012; Widmer et al. 2005). As Table 4.1 illustrates, only a small minority of people in Switzerland believe a mother should work full-time when she has either a non-school aged or school-aged child, with part-time employment or no paid employment more highly favored.

Before 2005, Switzerland was an exception in the European context. A federal law on parental leave was absent and protection for workers was granted by collective contracts and local administrative offices. In general terms, maternity was included in the the norms on worker's impediment without misconduct, similarly to other situations, such as job interruptions due to illness or compulsory military service (Aeppli 2012). This legislative frame granted 100% of the salary for a period depending from the job tenure in the enterprise and ranging from between a minimum of three weeks (in the first year) and three months (after nine years). Nevertheless, given that job interruptions due to illness and to maternity has an identical legal status, the days spent in medical leave (even during pregnancy) summed to the days spent in "maternity leave" limiting the maximum length of the paid leave. Aside from this general legislation, only public servants and the workers of around 40% of the companies had a proper maternity leave before 2005 (Aeppli 2012). As a consequence, legislation was extremely fragmented and generated low employment protection, especially for women with limited work time, discontinuous careers, or short tenure in the same company (usually young women). The current federal law on parental leave was introduced in July 2005 after a long arbitration process that ended with a referendum. The objectives of this reform were numerous and are hard to define given that the final law was the results of a compromise between the political forces in favor of these norms and the political forces against them. Surely these objectives included the extension of the eligibility of the maternity leave, the (economic) protection of mothers and children, and the equality between men and women on the labor market (Villiger and Huber-Hotz 2002). In order to pursue these objectives, the 2005 federal law unifies and establishes a set of norms for parental leave by outlining a minimum set of protections. Inside this framework, certain cantons, occupations (e.g., public sector workers), and companies supplement the national program with more generous parental leaves. At a federal level, parental leave benefits are provided to a mother from the day a child is born and lasts between 8 and 14 weeks. The first eight weeks are compulsory. After this time, the individual may return to work or extend their leave until the 14th week. A further two weeks without remuneration may be added. Leave cannot be resumed if a mother returns to work before the 16th week. During her leave, a mother receives 80 percent of her salary, up to a maximum of 7350 CHF per month for employees and self-employed workers (with the median salary approximately 6000

CHF). Union agreements and employment contracts sometime supplement public assistance through insurance or out-of-pocket benefits, providing "top-ups" to meet full wage replacement and/or extending the length of leave (Valarino, 2013). Unemployed women can benefit from the leave but must be registered with local employment placement offices. Furthermore, there are some restrictions surrounding the minimum amount of social security contribution paid. At minimum, all expecting mothers need to be registered as workers or unemployed for the period of pregnancy (seven to nine months) and five months before pregnancy. After the fourth month of pregnancy, special restrictions to the type of work a woman can perform are applied (e.g., more breaks, no dangerous or heavy duties) and the start of the parental leave may be taken early due to health reasons. The use of parental leave is widespread in Switzerland and the majority of recipients take up the maximum length of paid leave (Sottas & Millioud, 2008; Valarino, 2013). There is no specific law that regulates the male equivalent of parental leave (i.e., the paternity leave). However, private sector legislation guarantees one day of leave to fathers on the day a child is born. Some companies, and the public administration, provide more generous leaves, but long paternity leaves in Switzerland are rare (Valarino 2014).

The Canadian economic and labor market context

Canada has ten provinces and three territories governed by parliamentary systems at both the national/federal and provincial level. Canada is often categorized as a liberal economy where family and social support is largely provided through market mechanisms and state protection relies on residual support (Esping-Andersen, 1990). In terms of labor market regulation, workers in Canada have even lower levels of employment security than Switzerland, including the lowest level of protection against dismissal among OECD countries (OECD 2013b).

Although a traditional gender division of labor is still present in Canada, the majority of families include two working individuals (Statistics Canada 2016). Nevertheless, as shown in Table 4.1, women are also over-represented in part-time employment, although at a lower rate than Switzerland. Additionally, a greater percentage of both male and female part-time workers in Canada are involuntary (i.e., would seek additional hours if available). Table 4.1 illustrates that a larger share of individuals surveyed in Canada support the full-time employment of mothers when compared with Switzerland. Nevertheless, the majority surveyed still report preferring part-time employment or no employment for mothers of non-school-aged children. Finally, many Canadian households experience unstable work trajectories (Fuller and Stecy-Hildebrandt, 2015; Morissette and Ostrovsky, 2005) and struggle for work-family balance (Burke and Karambayya 2004; Lirio et al. 2007),

especially as women still perform the majority of household labor and childcare (Milan, Keown, and Urquijo 2011).

Parental leave policy in Canada is legislated at the federal level, although the province of Quebec has opted out of the federal system and instituted its own, more generous, system of parental and maternal leave (McKay, Mathieu, and Doucet 2016; Roy 2006). Governed under the *Employment Insurance Act,* parental benefits outside Québec currently provide up to 52 weeks of leave after the birth of a child. Reform extended parental benefits from 10 to 35 weeks in 2001. Although 15 weeks of strictly maternity leave is mandated, additional weeks may be taken by either parent consecutively or non-consecutively. Parental benefits provide 55% of an individuals' earnings to a ceiling of $543 Canadian dollars per week (as of January 2017). However, low income families are eligible for a family supplement, extending benefits up to 80% of average earnings. In Canada benefits are only available to claimants who have worked at least 600 insurable hours during a qualifying period of 52 weeks preceding benefits. Unlike in Switzerland, unemployment does not qualify one for benefits, as individuals employed less than 11 hours a week and unregistered self-employed workers are ineligible for benefits (Evans 2007). Given these eligibility criteria, a minority of Canadian parents remain excluded from the possibility to take a leave. Canada wide, eligibility for employment insurance remained at approximately 83 percent between 2004 and 2014, but is extremely low for youth between the ages of 15 to 24 (44% percent in 2014) and is lowest in British Columbia (77% in 2014) (Statistics Canada 2015). Among the people eligible for a maternity leave, a 2010 survey of children aged 1 to 3 found that 83.1 percent of mothers in Canada (97.3 percent in Quebec) took an average of 39.6 weeks of paid leave (45.4 weeks in Quebec) (Findlay and Kohen 2012). The same study found that 12.9 percent of fathers in Canada (72.5 percent in Quebec) took an average of 1.7 weeks of paid leave (5.5 weeks in Quebec). Moreover, differently from what happens in Switzerland, the Canadian leave has no compulsory period. This element could play a role in the definition of the parents work trajectories around a childbirth as some workers, especially who are in precarious job positions, could be subject to pressures coming from the supervisors. These pressures could push these workers to shorten their leaves or, even, renounce to this possibility.

4.4 Three hypotheses arising from the comparison between the Canadian and the Swiss context

In comparing parental leave policy and the social context of Switzerland and Canada few key differences are evident. Starting from these elements, we can set three hypotheses on the results of our analyses. *First*, Swiss and Canadian policies apply a different conception of maternity leave.

Swiss policy reform is focused on a short, but generous, compulsorily leave encompassing all women active in the labor market. At the contrary, Canadian entitlement remained elective and only available at a certain level of employment, even if it protects for a much longer period of time. The Swiss mandatory policy, in principle, should have a dramatic impact on all mothers' subsequent labor market trajectories. For Canadian women, we expect to find a greater range of possible outcomes, including expecting mothers who increase their participation in the labor market in anticipation of childbirth in order to qualify for benefits. Moreover, the more generous length of Canadian leave should strengthen its relative impact on mothers' participation in the labor market. In particular, the Canadian reform extended leave to the point where infants are more likely to be less demanding (e.g., more likely to sleep through the night, less likely to be still breastfed). Thus, we expect to find a greater number of Canadian mothers to return to (full-time) employment. *Second*, we expect the trajectories of both Swiss and Canadian men to change around the childbirth. Prior research has found that only a small minority of Canadian men participate in parental leave, and Swiss men are completely ineligible for coverage. Nevertheless, one of the main assumption of the life course paradigm, that is the large theoretical base for our study, is the "linked lives" principle (Alwin 2012; Elder 1995; Elder et al. 2004; Sapin et al. 2007). Any life course transition influences the life of the person that goes through the transition and the life courses of the people living closely to them. Consequently, we expect some sort of adaptation of fathers' careers due to the changes occurring in their family organization. Nevertheless, given the possibility of a parental leave, we expect these changes to be more demarcated in Canada than in Switzerland. *Third*, we consider how the impact of reforms differs by childbirth order. Research on the relationship between birth order and employment highlights that the life-course patterns of mothers is influenced by the number of children she has and distinct characteristics connected to birth order. For example, researchers find that first-time mothers face difficulties re-entering in the labor market (Rossin-Slater et al. 2011), while others state that additional children may also contribute to labor-market detachment (Han and Waldfogel 2003; McRae 1993). The effect of birth order is observed to vary according to national contexts (Rønsen and Sundström 2002); however, there is little insight into if policy reform maintains this difference or not. Some researchers do not observe change connected to birth order (Lalive and Zweimüller 2009), while others describe an impact, even if it is secondary to other sociodemographic characteristics (Joseph et al. 2013). As the role of this variable is debated in the literature (Joseph et al. 2013; Lalive and Zweimüller 2009), we adopt a purely explorative approach, without a proper hypothesis on this issue.

4.5 Data and research design

The Swiss data used in this research comes from the *Swiss Household Panel* (SHP) study, a currently ongoing longitudinal database that began in 1999 (Voorpostel et al. 2015). The SHP is a representative sample of the Swiss population and is composed of three samples collected in 1999, 2004 and 2013 that compensates for the effects of attrition. The yearly survey gathers a wide range of information, including a retrospective calendar covering the entire individuals' span of life. This calendar collects monthly information about health status, employment and residential arrangements. Our analyses rely on this retrospective calendar, in particular, on the employment data.

The Canadian data comes from the *Paths on Life's Way* longitudinal study, a currently ongoing longitudinal study that began in 1988. This study enables the analysis of employment patterns before and after the birth of a child within a single Canadian province: British Columbia. With a sampling frame drawn from the graduating high-school *Class of 1988,* the project was designed to assess educational, career, and life course trajectories from late adolescence through adulthood (Andres and Wyn 2010). Data from the *Paths* project now spans over a 22 years' period (1988-2010), with a 28th year follow-up currently underway. With a comprehensive focus on education, career, and family patterns, this survey gathers information on the month and year of children born to participants, as well as monthly information on employment and education activities.

Sample selection and variables used

From these data sources, we have selected our sample according to two criteria. First, we include only individuals who had children in the survey period, between 1999-2015 for Switzerland and 1988-2010 for British Columbia. The different time period does not significantly affect our analysis given the cohort structure of the Canadian sample: only a little minority of Canadian births took place in the early 1990s. The second criterion takes into account missing data. The sample used for analysis included individuals who provided month-by-month employment data from 24 months before to 24 months after the birth of their child. Thus, including the month of the childbirth, we analyze trajectories over 49 months. All individual sequences are aligned by the month of childbirth and the portion of employment trajectories beyond the 49 months' period is excluded from analysis. We include all individuals who had no more than 10 percent of missing monthly states; that is, in approximation, no more than 5 unrecorded months out of the total 49 months. We set this last parameter to avoid the presence of sequences with dramatically different lengths, but had to forgo 16.2% of the sample.

Using these two criteria, the final sample includes 916 Swiss and 935 Canadian employment sequences. These two samples are split in three subsamples each according to the birth order. We separate first, second, and subsequence order births to explore how patterns of employment trajectories change in relation to birth order. We also correct for the presence of twins. Each pair of twins is considered as a single childbirth. Nevertheless, if the couple has additional children later, the transition skips a position. For example, if a couple has twins, a single transition to the first child is recoded. If the couple has another child, it is recoded as a transition to the third child. Therefore, the transition to the second child would be considered missing, preventing analysis that consider the same sequence twice. Finally, due to the small number of individuals who had four or more children, we pool birth sequences that refer to the third or subsequent childbirth. Thus, our final sample is split into six subsamples: three for Switzerland (first, second and subsequent order children) and three for British Columbia (first, second and subsequent order children).

In our analyses, we use three groups of variables: sequence statuses, independent covariates and control variables. Sequence statuses are the monthly employment positions that compose the individual sequences. Both the Canadian and the Swiss sample are based primarily on the following four monthly employment statuses: full-time employment, part-time employment, inactivity, and unemployment. In addition, we record marginal statuses that are present in only one of the two geographical contexts. In British Columbia, Canada, the status "education" is used while, in Switzerland, we record the status "joblessness"[15]. Both these statuses are marginal but reflect slight data difference between the two samples. A further difference from the Canadian and the Swiss sequences is the coding of the parental leave. In British Columbia, parental leave is clearly defined while in the Swiss sequences the work position that precedes parental leave is maintained. These differences are taken into account during the analysis and commented upon, when necessary.

In the second step of analysis we use the sequence statuses as dependent variables to examine the effect of an independent dummy variable indicating if the childbirth happened before or after the parental leave reform. The dividing month used to create the dummy variable is January 2001 for Canada and July 2005 for Switzerland. Additional control variables are gender (male/ female), education (non-university credential/ university credential), age (<25, 25-29, 30-34, 35-39, >=40), nationality (Canadian or Swiss/ foreign), and fertility pattern (no more children/ additional children within two years/ additional children after two years or more).

[15] This category was used in the first wave of the Swiss Household Panel and collected both inactive and unemployed people.

Methods and analysis

Our analyses have two main components. First, we describe employment patterns surrounding the birth of a child and construct ideal typical patterns that describe their structure to compare Canada and Switzerland. To complete this analysis, we organize monthly work statuses in sequences and use cluster-based sequence analysis to find the ideal-typical patterns. Sequence analysis was introduced in the social sciences in the eighties (Abbott 1990) and it is now an established method to study longitudinal data (Blanchard et al. 2012). Numerous studies use sequence analysis to analyze life-course work trajectories surrounding the birth of a child (Davia and Legazpe 2014; Elzinga and Liefbroer 2007; McMunn et al. 2015; Widmer and Gauthier 2013). Despite the presence of a few alternatives (Bison 2014; Studer et al. 2011), cluster-based methods remain the most widely-used approach within sequence analysis. The main assumption behind cluster-based methods is that all the observed sequence are random variations around a small number of essential patterns.

Cluster-based sequence analysis entails two phases. The first, "matching" consists of the creation of a pairwise distance matrix that describes how different each sequence is from the others. The method we use is Optimal Matching with insertion/deletion cost of one and a constant substitution cost of two (Gabadinho, Ritschard, Muller, et al. 2011). The second phase is a cluster analysis based on the pairwise distance matrix. In our analysis, we follow a double cluster analysis as proposed by Studer (2013). An initial Ward clustering creates a set of clusters that are used as starting groups for a Partition Around Medoids (PAM) clustering. This procedure increases the efficiency of the algorithm and smooths the differences in the coding of the sequence statuses from Switzerland and Canada. We use average Silhouette Width Analysis (Rousseeuw 1987; Studer 2013) and Hubert's C Index (Hubert and Levin 1976; Studer 2013) to establish the most meaningful number of clusters. We use these statistical tools as a reference to guide our analytical choices, but our approach maintains a theory-driven interpretation. We analyze male and female trajectories together. Sequence analysis is not sensitive to uncommon patterns. Consequently, if a minority of women has a pattern that is typical of men careers, and vice versa, if we analyze separately men and women, we could have too few uncommon sequences to form a separate group and, though, lose this information. At the contrary, analyzing the sequences together, and introducing the gender variable successively, we avoid a confirmation bias (Wason 1960) and we are able to stress the presence of uncommon patterns. As discussed above, initial results are descriptive, with the resulting clusters comprising the dependent variables used in all the other analyses. In addition, they are useful to give a portrait of individual work sequences and, in relation with the literature, provide a validation of our datasets.

In the second section of our analyses we use simple tabulations and a set of binomial logit regressions to determine if the timing of childbirth relative to leave reforms impacts an individual's likelihood of following particular sequence types. We transform the variables that describe the cluster membership in a number of dummy variables. Each dummy variable has a simple presence/absence structure. It indicates if the individual is included in each cluster. These dummy variables are the dependent variable of each regression model, one for each cluster of sequences. The same analysis could have been performed using a multinomial logit regression. The two methods have the same structure and rely on the same assumptions (Pisati 2003). We prefer the use of a series of binomial regressions for the type of comparison that is returned by these analyses. With a multinomial regression, we measure the change in the probability of being included in a cluster against the probability to be included in another cluster (the reference). With a binomial regression, we are able to describe the change in the probability of being included in a cluster against all the others. Even if they are both meaningful analyses, this last solution returns an answer that fits our research question more cleanly. This set of binomial regressions allows us to consider the effect of policy change in each country considering the change in the likelihood of being included in each cluster before and after the reform. Differently for what we do for the sequence analysis, we calculate separate regression models for men and women. Despite the empirical choice is symmetrically different from what done before, the ratio behind our choice is the same, i.e. making more precise the results and stress the differences among men and women. This last part of the analysis provides an inferential examination of the effects of parental leave reforms on parents' work sequences.

The statistical significance of our results is calculated using a standard test of the null hypothesis based on a soil of 0.05 for the p-value.

All the analyses were performed using RStudio. In particular, sequence analysis is performed using the TraMineR package (Gabadinho, Ritschard, Studer, et al. 2011).

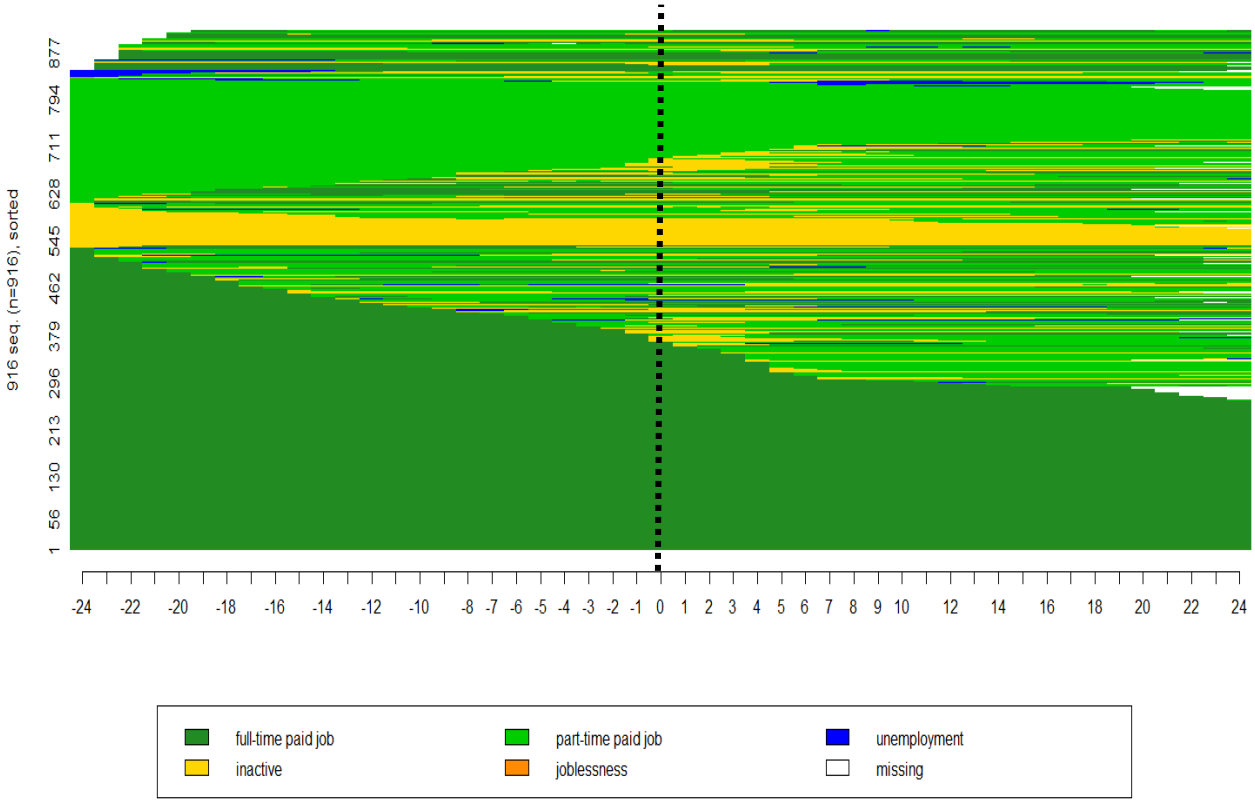
4.6 Work trajectories around childbirth

Employment changes around childbirth: Swiss results

Graph 4.1 provides an overview of all employment sequences in the Swiss sample. Each line in the graph represents an individual employment trajectory, with the various shades representing different employment statuses. As discussed above, the sequences began two years prior to a childbirth and extend for two years after. Figure 1 reveals a decline in full-time positions in favor of part-time positions that starts far before childbirth, increases around the timing of birth, and stabilizes after. In

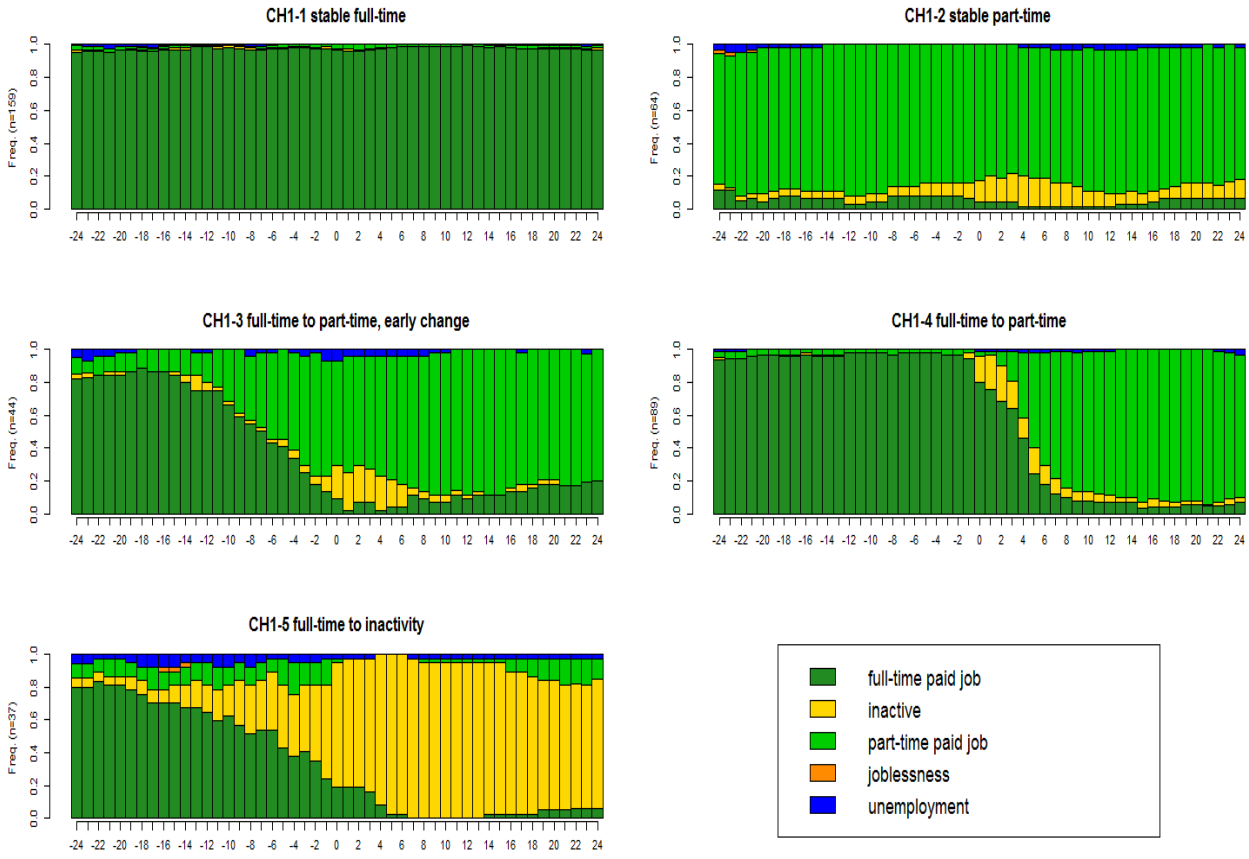
addition, the sequences became more unstable approaching childbirth, with more frequent changes in work status. This instability diminishes only partially after the childbirth. Unemployment is only marginally present and the residual state joblessness almost completely absent.

Graph 4.1 – Individual Employment Sequences of Swiss Parents around a childbirth



Graph 4.1 shows the variability in employment sequences around childbirth. To identify ideal-typical patterns within this diversity, we divide the sequences according to the order of the child (first, second, and further) and, then apply cluster analysis to create homogeneous groups. In this phase of analysis, we represent each cluster of sequences using transversal state distributions (Gabadinho, Ritschard, Muller, et al. 2011). These graphical representations of the sequences are composed of a series of cumulative bar plots of each state over time. Although this mode of representation sacrifices the description of each single sequence, it provides a better insight into the ideal-typical structure behind them.

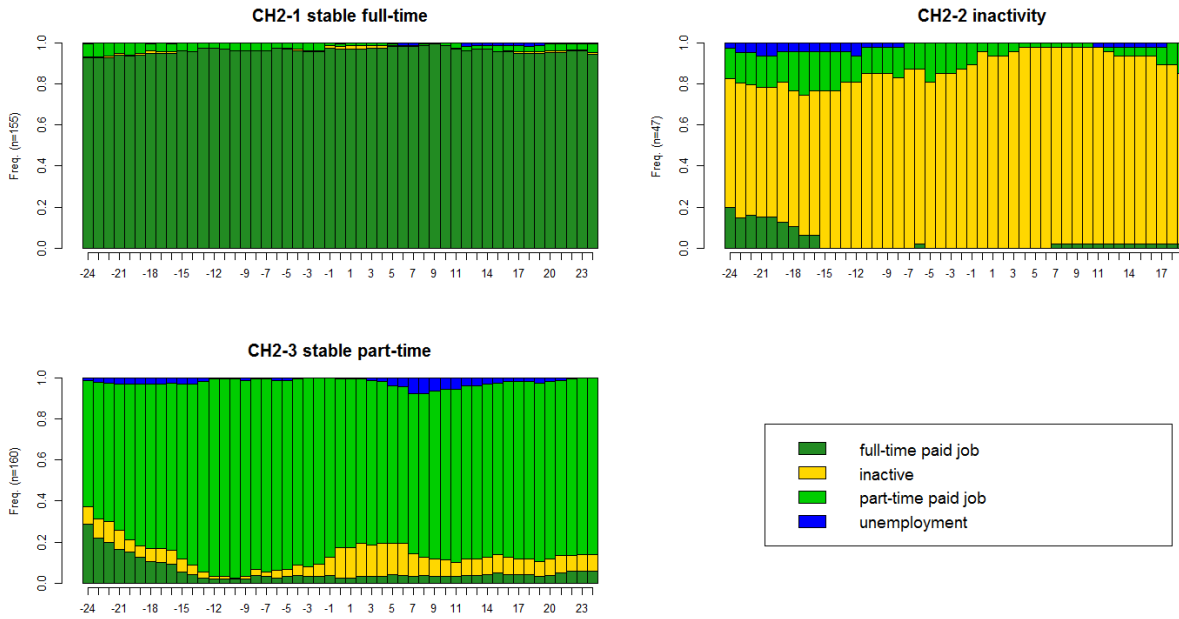
Graph 3.2 - Types of careers of Swiss parents around the first child (transversal distributions)



Group CH1-1 is the classic career-dominant pathway centered on stable full-time positions. Full-time work is the main employment state and childbirth is invisible as no patterned transitions are detectable. Consistent with past studies (Widmer el al. 2003), this group is mainly composed of men (94%) and workers with a university degree or above (61%). Further, it represented a normative pattern for men, with 75% of all men included in the entire sample in this group. The other pathways are dominated by women. Group CH1-2 (77% women) is very similar to the former group, but centered on stable part-time work. Other work statuses are almost absent, with only a marginal presence of inactivity and full-time employment that, when combined, never exceed 20% of total states. As in CH1-1, the presence of childbirth is invisible, with employment patterns before and after the birth indistinguishable. Possibly responding to the structure of the Swiss labor market (Widmer et al., 2003), 42% of this group consists of part-time workers who have only one child. Although the first two patterns do not reveal noticeable employment changes around childbirth, the others do. Groups CH1-3 (full-time to part-time, early change) and CH1-4 (full-time to part-time) are very similar and mainly consist of female workers (77% and 76% respectively) who transition from full- to part-time employment. The main difference is the timing of this transition. In group CH1-3, it starts around 12 months before childbirth and stabilizes around the month of child birth. Inactivity is a minority

presence in the first six months after childbirth and we observe some return to full-time employment from the seventh month onward. After childbirth, part-time employment remains the most common status and full-time employment has minimal presence (15% - 20%). In group CH1-4, the transition from full- to part-time employment starts around childbirth and stabilizes approximately eight months after. The early transition to part-time work is somewhat less common, with 18% of women following this pattern versus 35% of women changing after birth. Finally, participants in group CH1-5 transition from full-time to inactivity. This last group is mainly composed of women (92%) with pre-university education (68%). Eighteen percent of women follow this pathway.

Graph 4.3 - Types of careers of Swiss parents around the second child (transversal distributions)

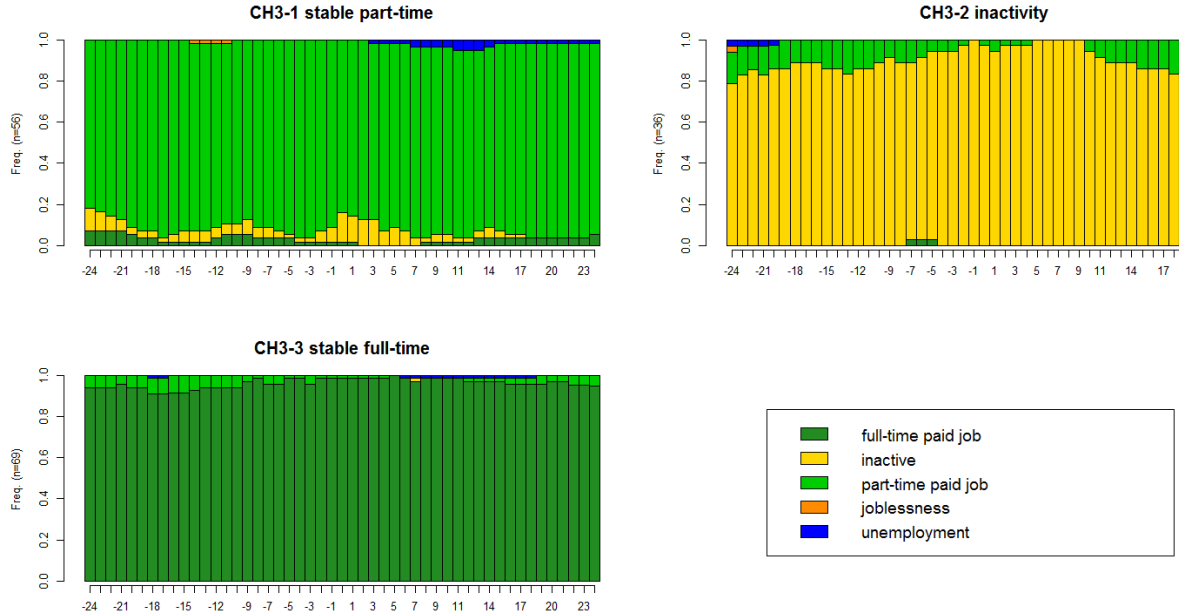


As shown in Graph 4.3, the transition to the second child resulted in three ideal-typical clusters in Switzerland. Notably, unlike first-order births, none of these groups are dominated by clear transition patterns. Group CH2-1 is comprised of stable full-time employment. As with the first child, this pattern is male dominant (94%), with the majority of workers holding a university degree (70%). This is also the dominant pattern for men, with 83% of all fathers in this cluster. Group CH2-2 is comprised largely of consistent labor force inactivity. This cluster also captures two small shifts that occur among a minority of sequences. The first starts a year and a half before childbirth with a quick disappearance of full-time work as well as a gradual reduction of part-time work that stabilizes, at a minimal level, around childbirth. After childbirth, full-time positions are almost absent and part-time states appear approximately 17 months later but remain minimal (around 15%). This group is largely female (92%) and with no university degree (70%). In group CH2-3, the majority of individuals are employed in a stable part-time job position. We observe a minor change as full-time work status

decreases and stabilizes around a year before the birth of the second child. After this period, part-time jobs remain constant except for the presence of inactivity in the period immediately following childbirth. This ideal-typical trajectory is overwhelmingly female (84%). It is also the dominant pattern for women, with 72% of second-birth mothers in this cluster. Again, this is very close to the share of women who are in the first-order birth clusters that end in part-time employment (78% are in clusters CH1-2, CH1-3 and CH1-4), reinforcing the lasting nature of employment transitions around the first birth.

Finally, sequence analysis applied to transitions surrounding the birth of the third and subsequent children in Switzerland result in three ideal-typical clusters, depicted in Graph 4.4.

Graph 4.4 -Types of careers of Swiss parents around the third or further child (transversal distributions)



These patterns are largely the same as those around second births: group CH3-1 contains stable part-time female employment sequences (80% women), group CH3-2 is centered on female inactivity (97% women), and group CH3-3 is a stable full-time male-based (4% women) employment trajectory. The only notable difference between the birth of the second and third/subsequent child is the presence of part-time work within the CH3-2 cluster. Part-time employment represents approximately 20% of the states. Although part-time employment is close to zero in the first months after the childbirth, it returns to rates prior to childbirth, with a rapid increase starting ninth months after childbirth.

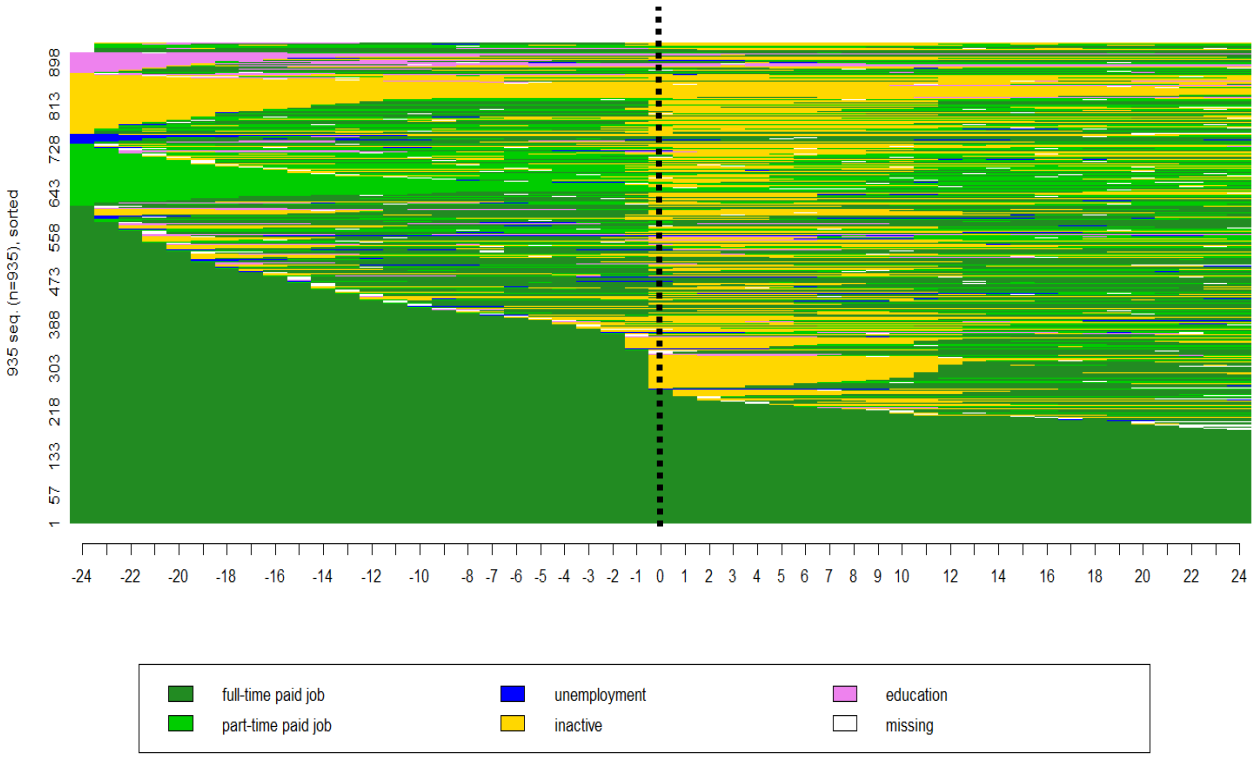
Our analysis of Swiss work trajectories surrounding childbirth highlights several notable elements. Consistent with prior research (Widmer et al. 2003), employment trajectories are strictly gendered. Men are overwhelmingly employed in full-time positions, while women move to part-time

employment and inactivity after the first birth, with the former more common. Employment changes that occur after a first birth for women persist, with second and higher-order births tending not to result in further employment transitions or new work-life patterns. Although the vast majority of respondents in the Swiss sample followed patterns consistent with prior literature which has emphasized the dominance of part-time employment and inactivity for mothers, closely examining the timing of transitions does reveal notable nuances. Notably, for some women, the transition from full-time to part-time work for the first child takes place several months before childbirth. This change restricts the scope of parental leave, as a reduction of work time results in a reduction of salary and the consequent parental benefits. This pattern more closely aligns with gendered social roles and expectations rather than the maximization of social benefits. This tendency to anticipate the birth of a child well before the due date may suggest a value system based on more rigid gender norms that drive transitions to a particular outcome. However, other ideal-typical patterns do not follow this logic. In particular, the CH1-4 pattern is very similar but describe a pattern that appears to maximize the monetary outcomes of the parental leave. Together these differences imply the presence of a variety of strategies that are based both on rational and on traditional elements.

Employment changes around childbirth: Canadian results

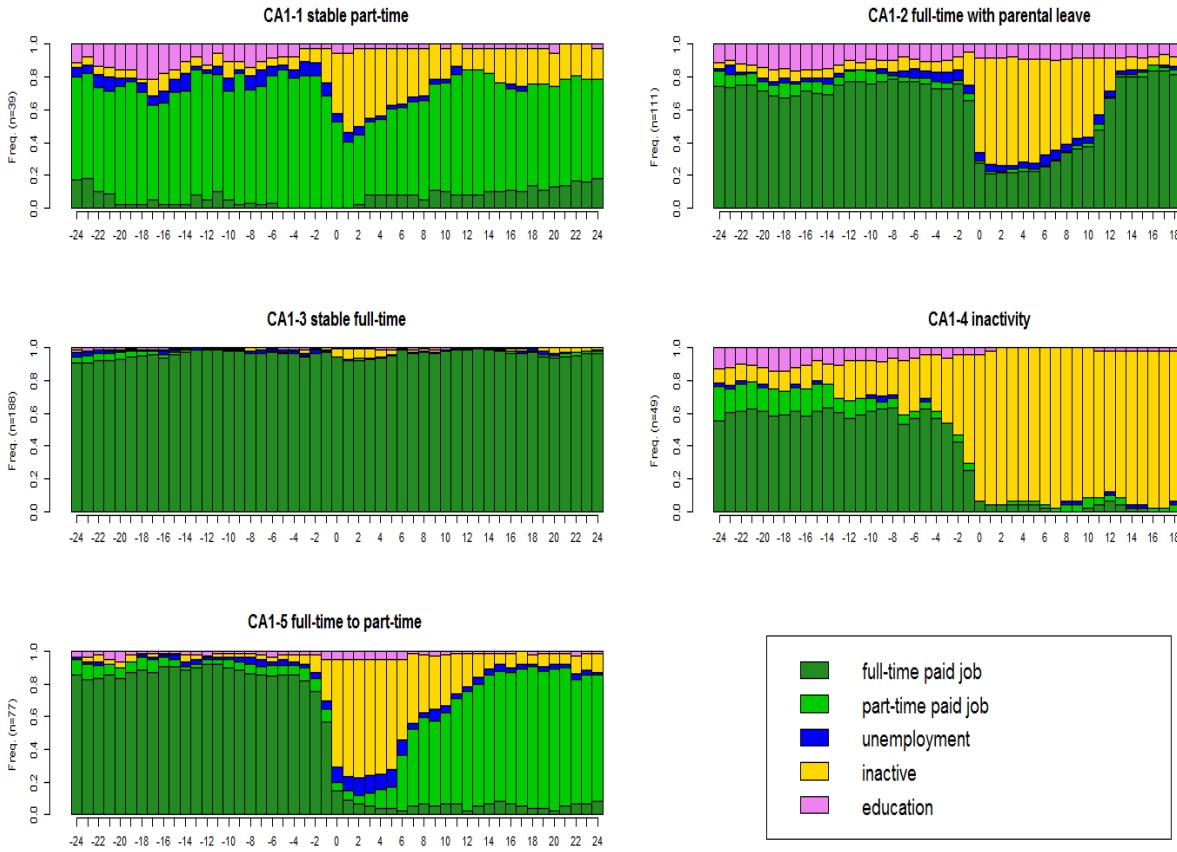
In this section, we describe the Canadian work sequences. Graph 4.5 shows the entire set of individual sequences. As in Switzerland, we observe a decrease in stable full-time employment. However, unlike the Swiss sample, there is a decrease rather than an increase in part-time work prior to childbirth. Twelve months after childbirth, the sequences generally stabilize, although outcomes are diverse. Compared to Switzerland, work sequences appear more discontinuous both before and after childbirth. We also observe a large presence of inactivity in the first year after childbirth, reflecting the coding of parental leave as inactivity in the British Columbia data (we recall that in the Swiss data leave is coded as the employment state prior to childbirth). Finally, we note the very small presence of the "education" status, representing full-time attendance in higher education (we recall that this code is absent in the Swiss data).

Graph 4.5 - Individual Employment Sequences of Parents in British Columbia around a childbirth (dotted line)



The next graphs highlight ideal-typical trajectories by birth order. As with the Swiss sample, we use the transversal state distributions. For to the transition to the first child, sequence analysis resulted in five ideal-typical clusters which are shown in Graph 4.6.

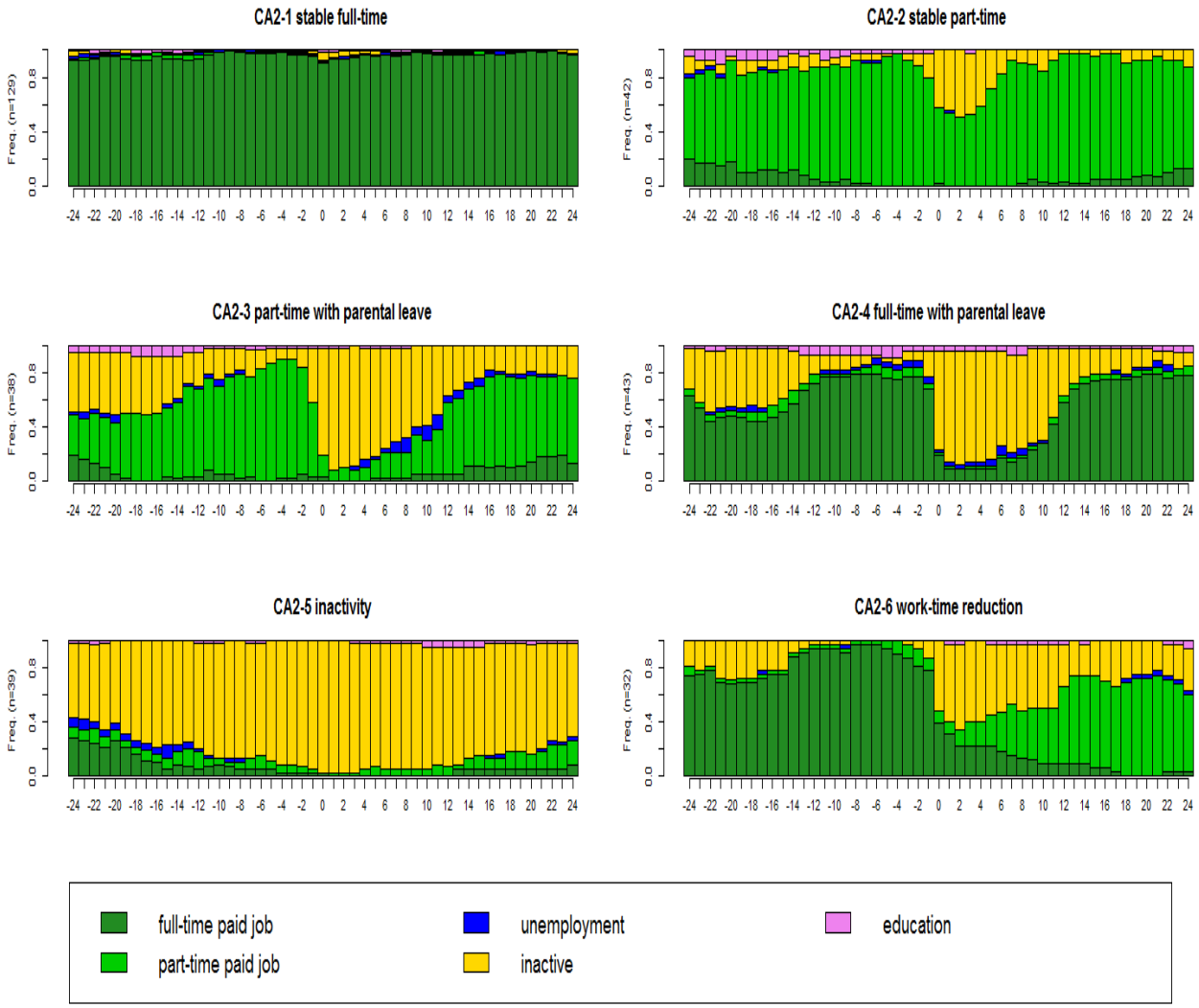
Graph 4.6 - Types of careers of parents in British Columbia around the first child (transversal distributions)



Group CA1-1 consists of sequences centered on stable part-time employment, with only a small level of inactivity. A small number of individuals participate in education, but only before childbirth. Surprisingly, given the large presence of women (92%) within this cluster, many remain in part-time work positions and either decide not to take advantage of parental leave or do not qualify for it. This group is most similar to the Swiss pattern found in CH1-2, but captures a much smaller share of female participants (12% vs 25% in Switzerland). Contrastingly, group CA1-2 and CA1-3 are characterized by stable full-time employment. In group CA1-2, which is female dominated (78%), trajectories are more complex, centered on a full-time job employment with parental leave, and include non-negligible presence of education and inactivity in the first 12 months after the childbirth. Note that while only 5% Swiss mothers immediately return to full-time employment after childbirth (CH1-1), about half (49%) of Canadian women follow this pattern (in CA1-2 and CA1-3). In group CA1-3, which is male dominated (69%), stable full-time employment is continuous through childbirth. This is by far the most common pattern among men, capturing 79% of the sample. Group CA1-4 (94% female) is a female-dominant group that exits the labor market at the moment of childbirth, with no marked re-entrance within 24 months. Notably, CA1-4 is highly educated with 61% holding a

bachelor degree or above. The percentage of individuals who transition to inactivity is similar when comparing Canadian and Swiss first-time mothers (15% vs 18% in CH1-5). Finally, group CA1-5 is a female-dominated group (94%) that typifies the work trajectory of those who transfer from full-time to part-time work position in conjunction with the birth of a child. Almost a quarter (24%) of the Canadian women follow this general pattern, compared to more than half of their Swiss counterparts (53% in CH1-3 and CH1-4). Overall then, work-life patterns among Swiss and Canadian men are similar, while Canadian women are more likely to remain in or return to full-time work, and less likely to transition to part-time work.

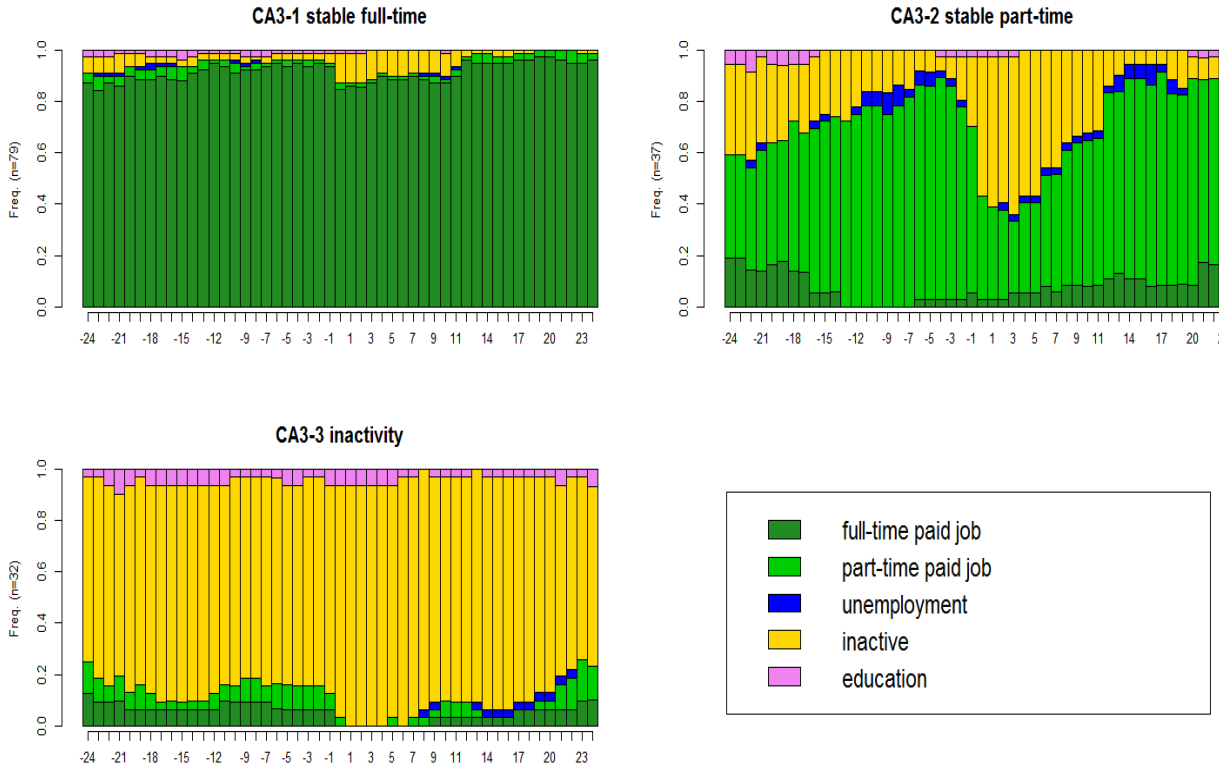
Graph 4.7 - Types of careers of parents in British Columbia around the second child (transversal distributions)



Sequence analysis for the second child resulted in six ideal-typical clusters. In contrast to what we observed in the Swiss data, we still find evidence of work transitions around childbirth. Group CA2-1 is a male-dominant group (79%) with stable full-time employment. Group CA2-2 is a female-

dominant group (93%) with stable part-time employment. Once again, only a minority of these workers take parental leave, as demonstrated by the relatively little presence of the "inactivity" status in the first months after childbirth. This group is slightly larger than its corresponding cluster for first births (19% vs 12% of women respectively). Group CA2-3 collects sequences characterized by part-time sequences with a parental leave. This group is composed of highly educated individuals (66% have a university degree or above) and is strongly female-dominated (95%). Group CA2-4 is identical to the previous, but characterized by full-time rather than part-time employment with a leave. The majority of individuals in this group are female (88%) but comprises only 18% of women in the sample. This means only 31% of women are back in full-time work after the birth of a second child, a sharp drop from the 49% of women who return to work full-time work after the birth of their first child. Group CA2-5 is the ideal-typical trajectory of people inactive in the labor market and is also female dominated (97%). Finally, group CA2-6 is composed by sequences that record a work-time reduction, from full-time to part-time or inactivity. These workers are mostly women (81%), but comprise only 13% of the overall female sample.

Graph 4.8 - Types of careers of parents in British Columbia around the third or further child (transversal distributions)



Sequence analysis for the third and higher-order births resulted in three ideal-typical clusters. Notability, these clusters mirror the second and third-order births in Switzerland, a finding that may

point to an increasing reliance on traditional gender roles and a weakening effect of state policy with more children. Group CA3-1 demonstrated sequences that are stable in full-time work positions and has a low, but not negligible, presence of women (23%). The presence of parental leave is minimal. Group CA3-2 highlights the trajectories of individuals, mainly (92%) women, who are in stable part-time employment both before and after the childbirth. Inactivity is also non-negligibly present, especially before the childbirth, but gradually decrease with time. Finally, group CA3-3 collects sequences of women (100%) that remain outside the labor market for almost the entire period under analysis.

Overall, while Canadian and Swiss men's work trajectories are very similar, there is more diversity in Canadian women's employment responses to childbearing. Although the vast majority of Swiss women are either inactive or in part-time work, Canadian women are more likely to return to full-time employment after the first birth. Nevertheless, it is necessary to contextualize these findings by highlighting that part-time employment is very common in Switzerland, and worktime reduction may lead to similar positions with fewer hours. In Canada and Switzerland, employment patterns become more traditional after subsequent births, suggesting a greater role in the cumulative load of care work and its associated costs in shaping decisions rather than the identity-transformation of motherhood per se. Yet, even with higher order births, we see a substantial share of Canadian women return to full-time employment. Although childbirth clearly impacts the employment trajectories of Canadian women, it is less likely to seriously reduce labor force activity. Thus, the transition to parenthood in Canada seems to be more pragmatically driven. This pragmatic view could explain the absence of the anticipatory reduction in labor force activity that we observe in some Swiss trajectories. Instead, we tend to observe an increase in the share of people employed, a phenomenon we fail to observe in any of the Swiss clusters. This behavior suggests coherence with a goal-oriented strategy to maximize the monetary outcome of the leave since pre-birth employment is necessary to qualify for leave benefits in Canada.

The effects of policy reform

To understand the effects of policy reform in each context, we now analyze how having a child before or after parental policy reforms influences one's likelihood of being found in a particular cluster. We use the month of the childbirth to define if the birth was before or after the reform. We expect that reforms may have a lagged effect on employment decisions insofar as those who are already pregnant or planning pregnancies before the reform may make decisions with pre-reform conditions in mind. Hence, we conduct two sets of analyses. First, we use as a dividing line the first month of the policy

reform. Then, we use the ninth month after the reform. Analyses are conducted separately for men and women, and also control for education, age and nationality. We separate the analyses for men and women in order to split the direct influence of the reforms, on women, which are directly concerned by the changes, and the indirect influence of the reforms, on men, which are concerned mostly indirectly.

Starting with Switzerland, we observe few effects linked to institutional reform. For clusters examining employment patterns surrounding the birth of the first child, we observe an increase (more than 2.5 times) in the probability for women to be in the cluster that collects sequences transitioning from full-time to part-time jobs. This effect is statistically significant only when we split the sequences nine months after the childbirth. For men, we observe no effect.

Table 4.2 – Effects of the reform on inclusion in cluster – first child, Switzerland (odds ratios)[16]

	CH1-1 Stable full-time (leave)	CH1-2 Stable in part-time (leave)	CH1-3 Full-time to part-time (leave, early change)	CH1-4 Full-time to part-time (leave)	CH1-5 Full-time to inactivity
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN					
Having a child after the reform[1]	0.76 – 0.93 (SD=.85) - (SD=.85)	1.00 – 0.76 (SD=.41) - (SD=.39)	0.59 – 0.62 (SD=.45) - (SD=.44)	1.69 – **2.58** (SD=.38) - (SD=.38)	0.82 – 0.58 (SD=.45) - (SD=.42)
MAN					
Having a child after the reform[1]	0.72 – 0.96 (SD=.41) - (SD=.37)	2.21 – 1.69 (SD=.79) - (SD=.67)	1.52 – 1.06 (SD=.85) - (SD=.74)	1.43 – 1.03 (SD=.59) - (SD=.51)	0.17 – 1.91 (SD=1.33) - (SD=1.33)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (CH/non-CH).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

We observe no effect linked to institutional reform for either men and women around the second birth.

Table 4.3 – Effects of the reform on the be included in the previously identified clusters – second child, Switzerland (odds ratios)

	CH2-1 Stable full-time	CH2-2 Stable in inactivity	CH2-3 Stable in part-time
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN			
Having a child after the reform[1]	0.70 – 1.08 (SD=.73) - (SD=.74)	1.09 – 0.93 (SD=.44) - (SD=.39)	1.03 – 1.04 (SD=.40) - (SD=.36)
MAN			
Having a child after the reform[1]	0.85 – 0.94 (SD=.51) - (SD=.46)	N.A. – 2.29 (SD= N.A.) - (SD=1.31)	0.95 – 0.94 (SD=.51) - (SD=.48)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (CH/non-CH).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

[16] In this table and in the following, the β values can be calculated applying the function logarithm to the odd-ratios.

For transitions surrounding the third or subsequent child, we observe a more than five-fold increase in sequences connected to part-time positions and an 80% decrease in sequences dominated by inactivity. For men, we observe no effect. Moreover, men in inactivity are so few that we cannot even calculate stable values.

Table 4.4 – Effects of the reform on the be included in the previously identified clusters – third or subsequent child Switzerland (odds ratios)

	CH3-1 Stable part-time	CH3-2 Inactivity	CH3-3 Stable full-time
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN Having a child after the reform[1]	**5.47 – 5.08** (SD=.59) - (SD=.55)	**0.21 – 0.21** (SD=.58) - (SD=.55)	3.35 – 5.38 (SD=1.58) - (SD=1.52)
MAN Having a child after the reform[1]	1.92 – 1.60 (SD=.76) - (SD=.72)	N.A.– N.A. (SD= N.A.) - (SD= N.A.)	0.43 – 0.53 (SD=.76) - (SD=.70)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (CH/non-CH).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

In examining the Canadian data around first births, we observe more than triple the probability of being included in the cluster that collects sequences with a longer leave and a return to full-time employment after the reforms. At the same time, we observe a decrement in the likelihood to being included in the clusters that describe a short leave and part-time employment (the probability is reduced by 80%-90%), and stable full-time employment with no leave (the probability is reduced by 75%). The last result is observed only when examining the effect of the reform nine months after the childbirth. Although the Canadian reforms increased men's entitlement to leave, the impact on work trajectories is found only for women. Moreover, some groups (CA1-1 and, partially, CA1-4 and CA1-5) have too few men to allow a calculation of the effects of the reform.

Table 4.5 – Effects of the reform on the be included in the previously identified clusters – first child, Canada (odds ratios)

	CA1-1 Stable in part-time (leave)	CA1-2 Stable in full-time (leave)	CA1-3 Stable in full-time (no or very short leave)	CA1-4 Full-time to inactivity	CA1-5 Full-time to part-time (leave)
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN Having a child after the reform[1]	**0.20 – 0.09** (SD=.67) - (SD=1.07)	**3.76 – 3.29** (SD=.49) - (SD=.42)	0.53 **– 0.25** (SD=.59) - (SD=.69)	0.85 – 1.01 (SD=.60) - (SD=.56)	0.84 – 1.56 (SD=.55) - (SD=.52)
MAN Having a child after the reform[1]	N.A. – N.A. (SD= N.A.) - (SD= N.A.)	0.71 – 1.34 (SD=.91) - (SD=.90)	0.43 – 0.63 (SD=.82) - (SD=.65)	N.A. – 0.63 (SD= N.A.) - (SD=1.44)	N.A. – 1.33 (SD=NA) - (SD=1.25)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (constant).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

Transitions surrounding the second child highlight a similar effect. We observe a strong increment of sequences with long leaves and full-time employment. Again, this occurs to the detriment of sequences related to part-time employment, and to sequences related to inactivity. For both these groups, the probability is reduced by at least two thirds. Similar to first-order births, these effects are present only for women. Men are so concentrated in the CA2-1 group (stable in full-time employment with no or a very short leave) that all the other groups have no enough sample size to support our analyses.

Table 4.6 – Effects of the reform on the be included in the previously identified clusters – second child, Canada (odds ratios)

	CA2-1 Stable in full-time (no or very short leave)	CA2-2 Stable part-time (no or short leave)	CA2-3 Part-time with parental leave	CA2-4 Full-time with parental leave	CA2-5 Stable in inactivity	CA2-6 Work-time reduction
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN Having a child after the reform[1]	1.47 – 0.79 (SD=.83) - (SD=.65)	**0.20 – 0.32** (SD=.60) - (SD=.59)	5.21 - 0.78 (SD=1.07) - (SD=.56)	**8.64 – 2.60** (SD=1.07) - (SD=.68)	**0.33 –** 0.90 (SD=.66) - (SD=.63)	0.70 – 0.86 (SD=.88) - (SD=.80)
MAN Having a child after the reform[1]	0.47 – 0.60 (SD=1.12) - (SD=.87)	N.A. – N.A. (SD= N.A.)-(SD= N.A.)	N.A. – N.A. (SD= N.A.) - (SD= N.A.)	N.A. – 1.50 (SD= N.A.) - (SD=1.19)	N.A. – N.A. (SD= N.A.)- (SD= N.A.)	N.A. – N.A. (SD= N.A.)- (SD= N.A.)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (constant).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

Finally, for transitions surrounding third or subsequent children, we observe a decrement in the probability to be present in the cluster describing sequences stable in inactivity (reduction of three quarters). Again, these effects are present only for women.

Table 4.7 – Effects of the reform on the be included in the previously identified clusters – third or subsequent child, Canada (odds ratios)

	CA3-1 Stable full-time (no leave)	CA3-2 Stable part-time (leave)	CA3-3 Inactivity
	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9	Time from the reform month 0 – months 9
WOMAN Having a child after the reform[1]	1.88 – 2.91 (SD=1.15) - (SD=.79)	3.52 – 0.55 (SD=.90) - (SD=.70)	**0.25** – 0.72 (SD=.83) - (SD=.68)
MAN Having a child after the reform[1]	17.98 – 6.08 (SD=1.89) - (SD=1.66)	0.06 – 0.16 (SD=1.89) - (SD=1.66)	N.A. – N.A. (SD= N.A.) - (SD= N.A.)

[1] reference: "having a child before the reform". Controls: education (classes), age (classes), nationality (constant).
N.A. = stable values non-available due to the low sub-sample size.
Significant values ($p<0.05$) in bold.

4.7 Discussion

Our results show important differences between the employment trajectories of Swiss and Canadian parents around a childbirth. In Switzerland, our data describe highly institutionalized and lasting patterns for parents, and support prior conclusions that Swiss parental leave policy reform has little to no effect (Aeppli 2012). Contrastingly, employment trajectories in British Columbia are more differentiated and reactive to policy change that resulted in stronger increases in labor force attachment by women. As it refers to the three hypotheses introduced in section 4.4, we find that only some of them are confirmed. The *first hypothesis* was based on the differences between the Swiss and Canadian approach to maternity leaves. Swiss policy reform is focused on a short, but more generous, compulsorily leave, while Canadian entitlement remained elective and leaves are longer but less generous. Given these characteristics and the pre-reform situation in the two countries, we expected the Swiss leaves to be very incisive but to have a homogeneous effect: the increment of (part-time) female employment. On the contrary, we expected the Canadian reform to have a more differentiated effect. Our data show that only part of this hypothesis was confirmation. The Canadian reform had differentiated, but coherent, effects: the increment of full-time employment (with leave), the decrement of part-time employment and inactivity. On the contrary, the Swiss reform had a very small effect that incremented part-time employment, but it is too small to be the incisive change we expected. The *second hypothesis* referred to fathers. We expected fathers to change their employment trajectories around a childbirth, especially after the reforms, and especially in Canada where the leave can be shared between the partners. This hypothesis is completely rejected. Even if we observed that a minority of Canadian fathers had trajectories that differ from the traditional "full-time, no-leave model", the reform brought no increment in the incidence of these patterns. We observe the same results in Switzerland, where the traditional "full-time, no-leave model" is very spread and remains untouched by the reform. This lack of effect is probably due to the structure of fathers' careers, already in line with the objective of the reforms (a stronger parents' participation in the labor market), and to traditional gender roles that keep them away from a reduction of worktime in favor of family duties. Our *third hypothesis* was much more explorative and referred to the different effect of the reforms depending on the childbirth order. Our results are in line with previous researches that described the differences given by childbirth order as present but secondary (Joseph et al. 2013). Even if slightly different, the effects linked to childbirth order are always consistent with each other. As it refers to the Swiss data, the few changes we detect reinforce the dominant pattern: an increment in the passage from full-time to part-time employment (first-order child) and an increment of part-time

to the detriment of inactivity (third- or subsequent-order children). As it refers to British Columbia, the effects of the reform are observable for all birth sequences and are consistent with the objectives of the parental leave reform. In line with the expansion of the parental leave eligibility, there is an increase in female employment in the first years after the first childbirth, with the increase focused on career patterns that includes a long leave and return to full-time employment. The effect is almost identical for the second-order child: we observe a decrement both in groups that collect sequences with a large presence of inactivity or part-time work positions without leave. For the third or subsequent child, we observe, again, a decrement of inactivity.

Parents with three or more children are the smallest groups, both in the Swiss and in the Canadian sample, and the less homogeneous, as they include both families next to the norm, i.e. two children (Kellerhals and Widmer 2005; Statistics Canada 2011), and families that, differently from all the others in our sample, are very far from these norms. We can expect these last families, in particular, to be a selected group with specific behaviors or life courses. Consequently, the results referring to parents with three or more children deserve a specific discussion. The presence of families with three or more children are similar in Switzerland and British Columbia, around 20% of the families with children, and showed a constant and sharp drop from previous decades (Kellerhals and Widmer 2005; Statistics Canada 2011). Our data show that in both contexts the birth of a high-order child (3 or more) rarely impacts parents' careers, and that, in both the territories, the reforms reduced the presence of inactivity among mothers at their third or further childbirth. Unfortunately, we do not have enough data to support a more specific analysis and not enough elements to understand if similar behaviors hide different motivations. Basing our statements on the results we have, we can conclude that parents with three or more children report behaviors that are consistent with what was reported by others parents. Also, the Swiss and the Canadian reform have effects on this subpopulation that are consistent with the effects on the other parents. Nevertheless, this remains an open point for further research.

Past literature suggests that both a favorable context and the characteristics of the reform could be part of the explication behind the differences observed in our results. On the one hand, a reform must guarantee a substantial change in the length of the leave or in the amount of the monetary benefits (Akgunduz and Plantenga 2013; Baum 2003; Waldfogel 1998). On the other hand, to be successful, a parental leave program has to be framed in a way that is consistent with cultural understandings of what constitutes a favorable family life and socially-accepted gender roles (Fouarge et al. 2010). Some cultural models may promote the labor-market attachment of mothers better than others. Family-friendly work environments, the presence of daycare, fiscal policies and many other structures

are also essential to support any parental reform. Given this background, we can give two possible readings of why the Canadian reform affected parents' work careers more than the Swiss one. On the one hand, we can propose a context-based explication, while on the other, we can focus on the technical elements that distinguish the Swiss and the Canadian reform. If we focus on the context, the greater acceptance of maternal employment in Canada has no doubt reduced barriers to mothers' full-time employment after childbirth. As discussed in the context section, the greater attitudinal support for maternal employment in Canada suggest that reforms aiming to increase labor force attachment by mothers might be more effective. On the contrary, if we examine the characteristics of reforms, we can use three elements to compare the Swiss and the Canadian reform: (a) the presence of monetary benefits (Baum 2003; Waldfogel 1998), (b) the presence of mandatory leaves (Baker and Milligan 2005; Erosa et al. 2005), and (c) the length of parental leave (Akgunduz and Plantenga 2013). The Swiss reform has an advantage on the former two aspects. First, monetary benefits are more generous in Switzerland, 70% of the former salary, compared to 55% in Canada. Nevertheless, in Canada, a "Family Supplement" is available for low-income families and can increase the benefit to 80% of the former salary. These supplementary measures almost erase the Swiss advantage. Second, unlike Canada, Switzerland has mandatory leaves. The presence of mandatory leaves is considered a protective factor for employees; consequently, the lack of a mandatory period could push some workers to reduce or, even, renounce their leave. However, in Switzerland, only the first eight weeks of the leave are mandatory, a short period that is likely to have little impact on individual strategies (Aisenbrey et al. 2009; Akgunduz and Plantenga 2013; Baker and Milligan 2005; Genre et al. 2010; Pettit and Hook 2002; Rønsen and Sundström 2002). The third aspect, the length of the leave, gives a clear advantage to the Canadian system, both if we consider the total length of the leave, and if we focus our attention only on the change introduced by the reforms. We recall that while the Swiss reform introduced a leave between 8 and 16 weeks, in Canada, the already existing leave was extended by 25 weeks to a total of 52 possible weeks. Although the optimal length of parental leave is disputed (Akgunduz and Plantenga 2013; Genre et al. 2010; Pettit and Hook 2002), the Swiss length of leave would be considered below the lower bound by the vast majority of researchers. This huge difference in the length of leave is most likely the factor that most impacted the response to policy.

4.8 Conclusion

Prior literature on parental leave reforms report contrasting results. Although many reforms had the common objective of providing better protection for (female) workers, only some were able to fulfill their objectives. Our analyses demonstrate how parental leave reforms with similar objectives

(Canada 2001 and Switzerland 2005) had vastly different outcomes on broader employment patterns in the four years surrounding childbirth. We stress that our samples are not representative of the entire population in Switzerland and British Columbia. Consequently, we cannot consider our analyses as an overall test for the effect of the two parental leave reforms. Nevertheless, our descriptive analyses are in line with larger studies stressing the pertinence of our sample.

The first part of our analyses focuses on the description of the employment sequences of Swiss and Canadian mothers and fathers around a childbirth. Starting with fathers, we observe that, in both contexts, fathers' employment trajectories were dominated by full-time employment that was unaffected by childbirth both before and after reform. Patterns for women, however, differed. Compared to British Columbia, inactivity and part-time employment were more common after childbirth both after and prior to the reform in Switzerland. We also observe a pattern of anticipatory reductions in labor force activity by Swiss mothers, an employment pattern that was absent in British Columbia, where mothers were more likely to increase their labor force activity prior to having children. A non-negligible minority of Canadian men and women were found to report work trajectories that challenge traditional gender roles, and women's labor market patterns after childbirth were more varied and less institutionalized in British Columbia. However, the birth of a child was still found to be a critical juncture that influenced survey participants, especially women, towards more traditional gender roles.

In the second part of our analyses, we study the impact of the Canadian and the Swiss maternity leave reforms. In general terms, we found that the Canadian reform had a stronger effect than the Swiss one. We observed an increment of full-time employment (with leave), and a reduction of part-time employment (without leave) and inactivity, after the application of the new legislation. The effects of the Swiss reform were much less important and, with an increment of part-time employment, reinforced the dominant pattern. In both countries, these effects are present only for women and, with little modifications, remain stable for any child order. The technical characteristics of the reforms, in particular the length of the leave, seem to play a major role in the differences between the effects of the Swiss and the Canadian reform. At the contrary, the universal eligibility and the compulsoriness of the Swiss maternity leaves seem to have little impact, probably due to the shortness of the leave that weakens the force of all the other characteristics. Nevertheless, the "technical" element is only part of a successful policy. The target of the reform and the cultural context must be considered. A parental leave program that aims to increase parents' participation in the labor market must be supported by efficient family-oriented services, and a culture open to family organizations and gender roles that challenge the traditional stereotypes. Again, the cultural context in British Columbia seems

to be more favorable to working mothers with very young children. This context probably plays a central role in the successful implementation of the Canadian reform.

To conclude, we stress that our results suggest the importance of information-based policies. The length of the leaves, the amount of the monetary benefits, the criteria used for eligibility, and the eventual compulsoriness of the leaves are all elements that should be considered when designing new norms on parental leaves. Nevertheless, our international comparison shows that a simple combination of technical elements is not enough to reach pre-defined objectives. The leaves must be framed in a larger context that includes both a culture favorable to working mothers with very young children, and other welfare dispositions that support families (e.g. tax reductions for families and affordable childcare). While these guidelines are directly established by policy makers, and can change relatively quickly, the cultural context often needs long periods to change, a factor that cannot be underestimated or considered uninfluential.

CONCLUSION

This last chapter of our thesis is composed of three sections. In the first, we recall the results of the three empirical studies (chapters 2, 3, and 4) and we discuss them as separate studies. In the second part, we consider the three empirical studies as part of a unique research design and we discuss specific aspects that give a contribution to the discussion of the three issues we have highlighted in the theoretical section of our thesis (chapter 1): the model of human action used in life course analysis, the heterogeneity of life courses in our data, and the longitudinal relations across the life courses. Finally, in the third section, we show the theoretical contribution of our thesis and the possible repercussions for social policies.

The results of the three analytical studies as separate researches

In the *first analytical study (chapter 2)*[17], we have studied the long-term effects of a period of unemployment on individual careers unemployment, i.e. the "unemployment scarring" (Arulampalam 2000; Arulampalam et al. 2001; Narendranathan and Elias 1993), in present-day Switzerland. We observed three types of unemployment scarring: long-term unemployment, occupational downgrading, and career instability. *Long-term unemployment* describes a recurrent situation of involuntary exclusion from the labor market or a long period of continuous involuntary exclusion. Coherently with previous studies (AMOSA 2007a, 2007b; Bigotta et al. 2011; OECD 2014; SECO 2015), our analyses show that this effect of unemployment is particularly severe among old and foreign workers. Both these two groups are probably victims of stigmatizations due to stereotypical expectations on these workers, often described as needy for further formation before being integrated as a productive worker. Aside this expected result, we have found another social group connected to long-term unemployment: highly-educated workers. Hints of this relation are present in previous literature (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006), but never discussed extensively, consequently, no conclusive explications can be addressed to this issue. Nevertheless, the identification of highly-educated workers as a potentially vulnerable group opens new perspective on the analyses of the Swiss labor market. The rift in the connection between high education and job stability has a large symbolic value. The individual return of the investment (of time and money) on high education in terms of salaries, prestige, and job stability was one of the core mechanisms of industrial societies. The validity of this mechanism in contemporary western societies is debated, both in the academic (Blossfeld et al. 2005; Ramos, Surinach, and Artís 2012; Uironnet 1999) and in the political field. Our analysis suggests that even the stable Swiss economy is

[17] This chapter was written in collaboration with Professor Felix Bühlmann (University of Lausanne – NCCR LIVES).

interested by this new phenomenon, even if limitedly. If this relation will be confirmed, the role of Swiss higher education and welfare structure could be questioned. A second effect of unemployment scarring is *occupational downgrading*. We define occupational downgrading as a decline in terms of occupational category after a spell of unemployment. This scarring effect is deeply linked with a specific socio-demographic category: women. Behind this result, we probably collect a set of different situations. We can hypothesize that two opposite social forces act on Swiss women. On the one hand, Swiss women are largely present in the national labor market (Le Goff 2005), especially in part-time job positions (Widmer et al. 2005). On the other hand, traditional gender norms and a low support for the work-family balance make difficult the (re)integration of women into the labor market (Buchmann et al. 2003). Consequently, this type of scarring can be either the result of a discriminatory process, or an active choice of positions with less prestige but greater possibilities to quickly reenter into the labor market in a position that can conciliate work and family duties. Obviously, these are rough explications. Individual strategies are, in all probability, a mix of both external pressure and active strategies. *Careers instability* is the last effect of unemployment scarring we observe. This scarring effect consists of increasing frequencies of job changes and a consequent reduction in employment spells length. Unemployment brings a general increase in career instability, but, some groups are more affected than others. Two opposite social categories are particularly affected. On the one hand, we have workers in jobs at the top of the socio-occupational scale, on the other, workers at the bottom of the socio-occupational scale (low qualification, low social origins, or low education). Given the antipodal position of these two groups, in all probability our measure captures two distinct phenomena. For workers at the top of the socio-occupational scale, career instability probably corresponds to a (voluntarily chosen) career flexibility. These workers have many economic and status resources. These resources provide a position of force in the job market. These workers can pass from a job to another and, even, spend small periods of time outside the labor market in order to find the best job position. As opposed to this, for workers at the bottom of the socio-occupational scale, the growing instability of individual careers can be a residual strategy. These workers can neither downgrade (they are already at the bottom of the occupational scale), nor remain for a long time outside the labor market (they may not have many economic or social resources). Consequently, they reorient themselves in order to compensate for the negative effects of this transitional period.

These results show that the label "unemployment scarring" includes experiences that differ both in the size and nature of the effects. Interestingly, the effects seem connected to workers' characteristics and strategies, but, also, to contextual constrains. Not all the strategies are available for all the workers. Consequently, if individual experiences are different, future research on unemployment scarring

should emancipate from the general comparison of theories and rather ask which theory is the more effective in the explication of each type of unemployment scarring.

In the *second analytical study (chapter 3)*, we have studied the differences in Swiss regional economies and labor markets. We start from a wide set of indicators, and we reduce the diversity present in the different cantonal markets to three idealtypical labor markets: marginal, attractive and multicenter labor markets. *Marginal labor markets* are local-based economies that are poorly attractive for workers of other territories, both in Switzerland and abroad. *Attractive labor markets* have opposite characteristics, they are highly attractive metropolitan labor markets that have only marginal boundaries with the local economy due to the presence of international and high-tech companies. They strongly attract commuters from the other cantons and, in some cases, the nearby European regions. Finally, *multicenter labor markets* are relatively large urbanized territories with many attractive areas, usually, the biggest cities. They are in an intermediate situation between marginal and attractive labor markets. They are often complex territories that include cities with international economies as well as rural areas with local-based economies. We, then, applied our typology to an empirical case. This empirical study shows how our typology can bring an added value to studies on the regional differences in the Swiss labor market. In this empirical section of the chapter, we study the movements of the workers that simultaneously changed both their residence and their job. In accord with the characteristics of the groups described in our typology, we hypothesize that workers move in the direction of central labor markets and away from marginal labor markets. When it comes to multicenter labor markets, their characteristics are consistent with two opposite hypotheses. Either these cantons are static territories, with few incoming and few outgoing workers, or they are very dynamic territories, with many incoming and many outgoing workers. In both cases the result would be a balanced situation that stands in between attractive and marginal labor markets. Our results support these hypotheses and show how multicenter labor markets are very dynamic territories with many incoming and outgoing workers. Moreover, each type of labor market attracts a specific type of workers. Marginal labor markets mainly attract low qualified workers, multicenter labor markets mainly attract workers with medium qualifications, while high qualified workers move in labor markets. Even if very simple, this exploratory empirical study confirms the characteristics of our typology and shows a possible application.

In the context of this thesis, the objective of this chapter is double. On the one hand, it introduces the context around the individual work trajectories. This context was a simple background in the former chapter and was recalled only to provide explications for the observed phenomena. In this chapter, in contrast, we directly relate contextual characteristics to changes observed at the individual level (the

job-related geographic relocations). On the other hand, this chapter provides a typology that can be used in other labor market and socio-economic studies. As any typology, what we have presented has some limitations. The multicenter group, in particular, shows one of them: independently from the territorial subdivision, any area is, to some extent, internally inhomogeneous. So why create a (new) typology? This type of instrument is largely used when the researchers want to introduce territorial differences in their studies. The simplest solution would be to use the 26 administrative areas of Switzerland called cantons. For labor market studies, in particular, Cantons would be a good option as they have a large decisional power on many policies that affect labor market characteristics (e.g. the laws on unemployment). Nevertheless, the use of this administrative division in empirical, especially sample-based, studies, has two main problems. First, some of the cantons are little or weakly populated. Consequently, intercantonal job markets are a common situation and areas with many work opportunities attract workers from a vast territory that overcomes the cantonal borders. Our results confirm this structure with central areas that attire workers from a large zone around them overcoming administrative and national borders. Some cantons are the center of a wide area that overcomes the cantonal borders (central labor markets), others are part of a labor market that has the center outside the cantonal borders (marginal labor markets), and others include many labor markets or parts of labor markets (multicenter labor markets). The second problem is merely technical. Cantons are often too numerous and too little to be included as separate categories in the analyses. Some studies (Bertschy et al. 2014; Lebert 2014; Sacchi and Meyer 2016; Wernli and Henchoz 2015) solve the problem using the linguistic division of Switzerland, or other divisions that are poorly related with economic and labor market characteristics. As we discussed at the end of chapter 3, these divisions bring only a marginal added value to economic and labor market analyses. As opposed to this, our typology returns a parsimonious set of types (three), with clearly identifiable characteristics that directly refer to economic and labor markets characteristics.

In the *third analytical study (chapter 4)*[18], we analyze a life course turning point that is external to individual work careers but has a strong influence on them: childbirth. Childbirth has the advantage to be an event that bridges individual live courses and the social and legislative context. On the one hand, the literature shows how childbirth influences individual live courses, job careers in particular (Giudici and Gauthier 2009; Le Goff et al. 2009; Widmer et al. 2005). On the other hand, the legislative frame strongly influences the effects of the childbirth. Maternity leaves and the measures to promote the conciliation of family and job have been shown to be relevant in the definition of

[18] This chapter is written in collaboration with Ashley Pullman (University of British Columbia), and under the supervision of Professor Sylvia Fuller (University of British Columbia) and Professor Lesley Andres (University of British Columbia).

individual strategies of face to a childbirth (Bergemann and Riphahn 2010; Joseph et al. 2013; Lalive and Zweimüller 2009; Rønsen and Sundström 2002; Schönberg and Ludsteck 2014).

The empirical research in this chapter is composed of two sections. In the first descriptive section, we consider the work careers of Swiss workers in the 49 months around a childbirth (from 24 months before to 24 months after it). These sequences are compared to a sample of work careers of Canadian parents living in British Columbia. This comparison provides further elements for the description and the understanding of Swiss careers as they give us a benchmark to evaluate the structure of our observations. Our descriptive results show how Swiss and Canadian individuals' work careers follow similar background structures. Men pursue rather linear careers centered on full-time employment. Women have more diverse careers with a predominance of part-time employment and a non-negligible presence of inactivity (an element almost completely absent in men's careers). These structures can be found in both countries. However, while the Swiss sample is pretty uniform, the work careers in British Columbia appear to be more diverse, with a higher share of men and women who do not follow the described patters. Focusing the attention on the changes caused by a childbirth, we notice that the strongest effects are brought by the first child. In general terms, the successive childbirths (when present) do not significative change parents' careers. Nevertheless, we observe little difference between Swiss and Canadian careers. As refers to the careers of Swiss women, the first childbirth is a strong normative event. The frequency of uncommon careers decreases, in favor of more standard patterns, i.e. full-time job positions for men and part-time job positions or, less frequently, inactivity for women. Sometime this shift anticipates the childbirth and, women change their job position few months before the childbirth. In British Columbia, the transitions are more diverse and, in a little minority of cases, we find changes in the work trajectories also around the second childbirth. This variety and a tendency to increment the weekly amount of works hours few months before the childbirth suggest a greater presence of goal-oriented strategies to the detriment of traditional behaviors. Nevertheless, our data do not report any motivation behind the observed behaviors, consequently, we have to relegate this hypothesis to the role of cue for further research.

These observations provide the background for the second part of this empirical study, i.e. the study of the effects of the reforms of the maternity leave program in Switzerland (2005) and in Canada (2001). These two reforms had a several objectives, and among them they shared the target of increasing the reintegration of mothers after the childbirth, and unify a fragmented legislative regulation. The study of the effects of a childbirth on job careers around a maternity leave reform gives the possibility to study the effects of the context as a dynamic element. In the description of the occupational careers in Switzerland and Canada, we have already introduced the context as an explicative factor. Nevertheless, we used it as a fixed element that remains roughly identical in the

considered span of time. In the analysis of the maternity leave reforms in Switzerland and Canada, we can observe a change in the context and how individual life courses adapt to it. Our results show a substantial stability of men's careers. Neither in Switzerland nor in British Colombia, Canada, the maternity leave reform has a significant effect. As refer to women, the reforms affected women's careers more strongly in Canada than in Switzerland. In the British Columbia sample, we observe a rise of (female) workers who take a leave and, then, (re)enter in a full-time job position after the childbirth. This goes to the detriment of inactivity and part-time job positions. In Switzerland, we do not observe the same effects. The careers of (female) workers around a childbirth are almost identical before and after the maternity leave reform with only a little increment of part-time work after the maternity leave. We propose two possible explanations of this difference. The first, is a simple suggestion for further research and relies on the different cultural context. As we have showed in the descriptive part, in the Swiss sample, we observe a strongly gendered labor market, and the presence of transitions before a childbirth that are consistent with a normative conception of women' role in the labor market. This conception links female workers with low-engagement job positions (notably, part-time work). These observations are in line with the previous literature on the subject (Buchmann et al. 2003). The Swiss reform was very strong at the symbolic level, but made a small change in the actual protections given to working mothers, and, in some cases, it even reduces these protections (Aeppli 2012). We, therefore, assume that the reform was not strong enough to overcome a grounded cultural model. Nevertheless, our data do not include the motivations behind the behaviors of the workers in our sample. Consequently, we cannot test this hypothesis, but, only, leave these hints as a starting point for further research. The second possible explanation is more grounded in the empirical data, and relies on the characteristics of the maternity leave reforms. In particular, we focus our attention on the magnitude of the changes that these reforms brought on three aspects that are stressed in the literature on the subject: monetary benefits (Baum 2003; Waldfogel 1998), the mandatory character of leaves (Baker and Milligan 2005; Erosa et al. 2005), and the length of the maternity leave (Akgunduz and Plantenga 2013). The Swiss reform made a stronger change in two of these three elements. Mothers' monetary benefits passed from a variable amount depending on company-level accords to the 70% of the salary, while in British Columbia they did not increased (but the eligibility was expanded). In addition, the Swiss reform introduced mandatory leaves, an element that is absent in British Columbia both before and after the reform. Nevertheless, these advantages are less extended than what it seems. Even if a federal maternity leave program lacked in Switzerland before 2005, many companies already had maternity leave programs. Consequently, the change in the amount of the maternity leave monetary benefits was less dramatic than what it may seems, and, in some cases even negative. In addition, a share of families in British Columbia can access to family supplements

and to other forms of support. Consequently, the post-reform situation is similar in the two countries. As refer to the compulsoriness of the leave, the contribution of this norm is counterbalanced by a high participation of Canadian women to the maternity leave program. 77% of eligible mothers take advantage of maternity leave, with an increasing trend of participation after the reform (Marshall 2003). Again, the situation in the post-reform period is similar in the two countries. The last element of comparison between the Swiss and the Canadian reform is the length of the maternity leave. This characteristic goes in favor of the Canadian reform. The Swiss reform increased the length of the maternity leave up to 16 weeks for the people that were not included in former programs, but much less for the people that were included in the previous existing programs. In some cases, the reform even decreased the length of the maternity leave (Aeppli 2012). As opposed to this, the Canadian reform increased the length of the maternity leave of 25 weeks until a maximum of 52. Both the post-reform length and the increment introduced by the reform are much extended in British Columbia than is Switzerland. This element seems determinant in the success of the Canadian reform. The optimal length of maternity leave in order to effectively sustain the (re)employability of mothers is debated in the literature (Akgunduz and Plantenga 2013; Genre et al. 2010; Pettit and Hook 2002). Nevertheless, almost the totality of the researchers would consider too short the 16 weeks provided by the Swiss law. The low impact of Swiss reform can, thus, be attributed to the insufficient length of the maternity leave that leaves uncovered part of the first months after the childbirth.

What we have just described are the results of the three empirical studies that compose our thesis discussed as three independent research. This discussion is propaedeutic for the next sections of our conclusion where we discuss particularly aspects that are common to all the empirical studies. In this last part of the conclusion, we consider the three empirical studies as part of a single research and we take for granted many elements, about the structure of the analysis and their results, that we have just discussed.

The results of the three empirical studies as parts of a single research

The three empirical chapters that compose the core of our thesis can be read as part of a single research design, that finds its theoretical basis in the theoretical chapter. When considered all together, the objective of our analyses is the study of the mechanisms that connect individual life courses with the socio-cultural context during life courses turning points. This is a very large objective. Consequently, we have reduced the scope of our analyses to two life course turning points, unemployment and childbirth, and a single context, Switzerland (only in the fourth chapter, a second context, British

Columbia, is discussed). As we have discussed in the theoretical part of this thesis (chapter 1), turning points are short events that devise two clearly distinguishable periods, and have consequences that reorient an entire life course process (Abbott 2001; Grossetti 2006). Given the strong discontinuity that is related to life curse turning points, it is easier to evaluate the individual strategies and their relations with larger processes linked to the socio-cultural context. In addition, employment trajectories are linked to many other life course domains (Pollock 2007) and have repercussions that go beyond the mere development of individual careers (Engelhardt 2010; McKee-Ryan et al. 2005; Oesch and Lipps 2012). These characteristics make them a privileged point of view to observe the relation among different life-course domains and the socio-economic contexts. Consequently, even if our empirical ground of study is limited both concerning the topic and the territorial context, the observations supported by our results can be used for a wider discussion on the study of individuals' life courses.

Given these premises, our thesis follows a step-by-step approach. We start from a description of the individual work sequences (chapter 2) without the interaction with contextual variables. The social context is introduced only indirectly, through the effects of individual socio-demographic characteristics and their influence on the work sequences. Then (chapter 3), the Swiss context is introduced and we describe how the social and labor market context influences individual work careers. In chapter 4, we combine these two elements in an analysis that includes both individual-level elements and contextual influences. Finally, we take a step further and we consider the socio-cultural context as a changing factor. Following this structure, we can relate the results of each empirical study within a single analytical frame.

In general terms, our conclusions reinforce the conception of life courses as individual experiences framed in a social context (Elder et al. 2004; Settersten and Gannon 2005). The two life course turning points studied (unemployment and childbirth) proved to be trigger events that make more visible the relations between individual strategies and contextual influences. These influences take the form of both social interpretations of individual characteristics, normative constrains (laws and social norms) and prescriptive behaviors. In terms of specific results, our analyses confirm previous studies on Swiss employment trajectories and add new elements. Specifically, we have observed that foreign, old workers and women remain among the most vulnerable workers in the Swiss labor market (Bigotta et al. 2011; SECO 2015). Regional differences in the structure of the labor markets are rather relevant. However, this regional heterogeneity simply attenuates vulnerability based on individual characteristics, but never erases it. At most, these regions create a flux of workers that move from a regional labor market to another, looking for better opportunities. Aside to these groups traditionally

described as vulnerable, new sections of the population appears to be more and more vulnerable during life course turning points. Notably, high-educated workers seem to have difficulties to re-enter the labor market after a period of unemployment (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006). Life course turning points exacerbates the differences in the population and trigger a more rigid application of social norms. Our results clearly show how the presence of uncommon work trajectories decrease, in favor of more widespread patterns, in the period around a life course turning point. Gender norms, in particular, appear to be very strong and to define very specific trajectories for men and women. As refer to the new elements discussed in our thesis, they can be collected around three issues in particular: the model used to describe human action in individual life courses, the heterogeneity of life courses in our data, and the analysis of longitudinal relations across the life courses. In the next section of this conclusion, we discuss the contribution of our thesis to these subjects.

An empirical-informed model of human action

In the theoretical section (chapter 1), we have described how a shared model of human action is absent in life course theory. Nevertheless, the majority of the researchers in this field argue that individual agency is limited by external forces, usually cultural models. Some researchers stress these limitations as prevalent (Settersten and Gannon 2005), others give more importance to individual agency (Billari and Liefbroer 2007; Gecas 2003). The analyses in this thesis support a conception of individual action close to what was theorized by Elder and colleagues (2004). They describe individual choices and actions as framed, but not determined, by opportunities and constraints of history and social circumstances. We also add further elements to the discussion. Two issues in particular arise. First, the force of individual agency over external influences seems to vary among groups of the population. Second, cultural models seem to be one of the causes of the constraints that limit individual agency, but not the only one.

Starting from the variation of individual agency among different groups of the population, our results suggest that the possibility to exercise individual agency is strongly associated to socio-demographic characteristics. We observe few situations that reveal the presence of an almost unrestricted individual agency. For example, in the first empirical study (chapter 2), we observe that workers that were previously in job positions at the top of the socio-occupational scale have work careers that, after a period of unemployment, are more unstable than the average. This result can be hardly interpreted as a symptom of vulnerability, given the large availability of social and, often, economic resources that characterize these workers. An alternative explication is based on the very few constraints to their

goal-oriented strategies. Agency is often described as the power of actors to operate independently from social constraints. Usually this status corresponds to the possibility to choose among a wide set of options. Results of chapter 2 stress that a further element must be added, i.e. the possibility to have different approaches to a problem, including the possibility to decline some opportunities and wait for a better solution. This perspective introduces a longitudinal element in the conception of agency and stresses the importance of individual resources. Workers who, before the unemployment spell, were in job positions at the top of the socio-occupational scale have enough resources to reorient their work careers several times as a consequence of their active strategies. This is not the only example of actions that largely rely on individual agency. Another hint of explicit goal-oriented strategy is observable in the rise of the weekly working hours of some Canadian mothers just before the childbirth (chapter 4). An increase of the weekly working hours raises the eligibility for and the eventual benefits of the maternity leave program. This goal-oriented strategy is supported by a favorable welfare system and, probably, individual resources that mitigate the force of external constraints. We had no possibility to check for the importance of individual resources, but the simple fact that only a minority of mothers pursues this strategy indicates that the preconditions to this strategy are also based on individual elements. The just described observations refer, in both cases, to a small minority of our sample. The majority of the analyzed cases show situations that can be described as the consequence of a mix of individual agency and external constraints. We do not have data on the motivations behind the work trajectories we observe. Consequently, we can only speculate about how much they are consequences of individual choices and how much they are linked to external pressures. For example, we have discussed how women's higher propensity to accept an occupational downgrading can hide different situations. On the one hand, some women can decide to transit in a less prestigious, but, also, less demanding job position in order to dedicate more time to other duties (notably, family). On the other hand, some women are victim of a stigmatization that describes them as poorly engaged to their job positions (Buchmann et al. 2003). Probably, in most of the trajectories, both active choices and discriminatory dynamics are present. Together with transitions largely driven by individual agency, and situations where agency and structural constraint are present together, there is a third type of observation that refers to cases where the context strongly limits individual agency. Some negative situations can hardly be described as the result of an active choice. For example, in chapter 2, we have described how old and foreign workers have a high probability to fall in long-time unemployment once entered in unemployment. In line with the terminology used in the study, we define unemployment as the situation of a worker that actively looks for a job position but cannot find it. Consequently, we know that workers in long-term unemployment are forced in a position against their will. In this case, the context overwhelms

individual agency. The presence of very diverse situations in our data suggests that a single model of human action that includes both individual agency and contextual constraints is largely supported by our data, but needs to be related to socio-demographic characteristics. Even if every worker has the possibility to exercise their "agency within a structure" (Settersten and Gannon, 2005: 41), the limits vary depending on individual situations. Our results provide elements for a discussion of a changing relation between individual agency and structural constraints, which depends on one's social group, that can be developed in further studies.

Our analyses stress the importance of a second element referring to the relation between individual agency and external influence. In the literature concerning life courses, cultural models are often discussed as a limitation to individual agency (see chapter 1). Less attention is given to another type of constraint, i.e. the availability or non-availability of certain options. This element is not new to social sciences. In the seventies, Roberts (1984, 1977) introduced the term of "opportunity structure" to describe the limitations of individual agency due to external constraints to the transitions from school to work. Similarly, other researchers have stressed how individual choices are limited by the amount of vacancies in a certain job sector (Sørensen 1977), the presence of public policies (Schmid and Reissert 1988), or the characteristics of local labor markets (Lewin-Epstein and Semyonov 1992). Even if most of the time these limitations are introduced as an alternative to culture-based explications, some researchers stress their interaction (Butler 1976; Lewin-Epstein and Semyonov 1992). Butler (1976), in particular, studies military careers and points the attention on the labor market opportunities provided by a different education degree. These limitations influence the level of engagement in the army and interact with cultural elements (notably, racial discrimination) in the definition of the individual job career options. Even if this approach was conceived in the seventies and the eighties, these structural limitations are still observed in contemporary labor markets (e.g. Buckner, 2009; Riccio, 2013; Wolbers, 2007). In our analyses, we can observe a different "opportunity structure" among groups of workers especially in the first analytical study (chapter 2). The group that suffers more severely from these limitations are the workers that transit in unemployment from a job position at the end of the socio-occupational scale. Given their position, they cannot pursue a strategy based on an "occupational downgrading", i.e. the re-entering in the job market in a less prestigious job position. They are already at the bottom of the socio-occupational scale. This observation recalls the "closure theory" (Parkin 1971, 1979) that describes labor markets as separated in hierarchically-ordered sections. Differently from what was described by Parkin, the difficulty to change from a section of the labor market to another is not given by a social dynamic but by structural impossibility to downgrade. Nevertheless, we can use this frame to stress the double disadvantage that characterizes the workers at the bottom of the socio-occupational scale. On the one hand, their position often gives

these workers fewer social and economic resources. On the other hand, they have a smaller set of strategies to overcome eventual critical events or to redirect their careers. An opposite situation features the workers at the top of the socio-occupational scale. In this case, the introduction of structural limitations addresses a possible methodological error and helps show a misleading measure of vulnerability. These workers cannot have an occupational upgrading as they are already at the top of the scale. If they move, they downgrade. Consequently, their high probability to downgrade that we observe in the data is overestimated and, finally, spurious. In general terms, the introduction of different opportunity structures shows the multidimensionality of the limitations to individual agency. Not only does each individual have a different amount of resources to invest in their strategies to overcome eventual critical events, but they also have an unequal access to certain strategies. Our data suggest that opportunity structures can play an important role in life course analysis, beyond labor market issues. As other researches have suggested, they are not conceived to substitute cultural explication, but to integrate them, giving a more detailed portrait of individual strategies during the life courses and their limitations.

To conclude this session, we can affirm that empirical results in our thesis support the conception of human action used in life course analysis. In particular, the model we have described is close to Elder's description of "individuals [that] construct their own life course through the choices and actions they take within the opportunities and constraints of history and social circumstances" (Elder et al. 2004: 11). Our theoretical contribution relies on the two aspects just described. The first is the necessity to focus more attention on the different strength that external constraints take depending on the individual characteristics. The second is the rediscovery of "opportunity structures" as an integrative instrument to describe limitations to individual actions that are independent from the cultural context and individual characteristics.

Heterogeneity of life courses

Many authors (Furstenberg 2003a; George 2003; O'Rand 2003) discuss the problem of heterogeneity in life courses. In our thesis, we stress two elements connected to this issue. The first refers to the nature of inter-group differences. The second is directly linked to the differences we have observed in our data, in particular, a women's situation.

As it refers to the first point, our results stress how different groups of the population experience consequences of the labor market that differ both in strength and in nature. In chapter 2, we have described the importance of a multilevel measure for unemployment scarring and, by extension, for

all the consequences of life course turning points. In our analyses, we have differentiated the effects of unemployment scarring, both using their strength and their nature. Some groups are vulnerable if we consider a certain measure, while they are resilient if we consider other measures. This observation is particularly relevant when we observe no effects of a life course transition on a particular group. In this situation, we cannot distinguish if this group experiences no consequences of that life course transition or if this group does experience consequences that are not disclosed by the measure we are using. This is not a simple problem of incompleteness of the results, as some measures can lead to a complete exclusion of some groups from the discussion. For example, measuring the unemployment scarring as "wage penalty" (Arulampalam 2000; Arulampalam et al. 2001; Narendranathan and Elias 1993) fails to cover the workers who transit in long-term unemployment or exit the labor market. A further element complicates this analysis. Sometimes the variables that divide the population in groups (that experience different consequences of life course turning points) are not linked to individual characteristics, but to contextual ones. For example, in chapter 3, we have discussed the influence of the structure of the Swiss regional labor markets on individual job-related mobility. In this case, the difference among education-based or age groups make sense if related to the characteristics of the labor market in which these different groups of workers move. The use of a multidimensional measure, like the typology presented in chapter 3, reveals these relations. Differences based on socio-demographic groups are not only relevant at the analytical level. Social policies need to consider these differences when they define their target populations. In chapter 4, we have shown the different effects of the maternity leave reform on mothers at the birth of their first, second, or further child. An evidence-based policy needs to take into account these differences or, at least, assume that different groups of the population will react in different ways to the changes introduced in the new regulation. This awareness allows the creation of laws tailored on the exigencies of specific populations, and aiming at precise objectives. Obviously, a complete description of the effect of life course transitions is not achievable. Nevertheless, the use of multidimensional and combined measures has a double advantage. On the one hand, they describe more precisely the different groups in the population. On the other hand, they are a fundamental step toward a holistic view of life courses, a perspective more and more used in life course analysis (Bernardi et al. 2017; George 1993; Pollock 2007).

The second contribution of our thesis on the heterogeneity of life courses is more descriptive and focuses on the differences in Swiss careers. In the theoretical section (chapter 1), we have stressed how life course literature displays the importance of factors, such as ethnicity, social class, and gender. In our results, gender differences in particular arise in several points of this thesis. Compared to men,

whose majority has trajectories focused on the work dimension, previous literature on the careers of Swiss women stresses the presence of two opposite forces. On the one hand, female presence in the labor market is a widespread reality (Le Goff 2005), while on the other hand, stereotypes against the capability and the opportunity of a working women are still present, especially in early stages of the family cycle (Buchmann et al. 2003; Giudici and Gauthier 2009; Le Goff et al. 2009; Widmer et al. 2005). Our results support this description and specify some details. In the descriptive part of chapter 4, we observe a clear division between men and women. The first pursue pretty uniform work sequences characterized by full-time positions, while the latter have more diverse careers and record a non-negligible presence of part-time work and inactivity. In particular, the first childbirth reinforces these divisions. A significant share of the Swiss women in our sample passes from full-time positions to part-time and inactivity. The results discussed in chapter 2 show another aspect of the differences between men and women. After a period of unemployment, women have a stronger propensity to experience a socio-occupational downgrading. We have discussed, at least as part of this phenomenon, that it can be connected to the presence of contextual forces that relegate women in jobs with less responsibilities. Following the literature on the subject, we can take a step further and hypothesize that a period of unemployment is interpreted as a confirmation on previous ideas on women's lack of work commitment (Buchmann et al. 2003). We have no elements to provide a conclusive response to this point that remains a potential base for further research. Nevertheless, both the analyses in chapter 2 and 4 strongly suggest that life course turning points exacerbated gender differences that already pre-exist. Life course turning points seem to reveal structural differences more than be their cause. Consequently, eventual welfare policies that want to act on these differences must include measures that are not limited to the effect of a single life course turning point but that work on the structural (cultural, economic) limitations of individual action.

The last point we want discuss are the regional differences in this scenario. As we have reported, compared to other European countries, Switzerland is characterized by a strong female participation in the workforce (Le Goff 2005). Nevertheless, this presence is not homogeneous. In our second empirical study (chapter 3), the presence of the female workforce is one of defining factors of the three ideal typical labor markets that we have identified. Even if, on an international perspective, the levels remain high, a strong presence of women in the workforce is linked to the centrality of the labor markets. "Attractive" labor markets have a high likelihood to record a strong presence of women that diminishes if we pass to "multicenter" labor markets, and that reaches the minimum in "marginal" labor markets. This result is consistent with previous research (Goebel and Ehrensperger 2009; Jeanneret and Goebel 2012) that relates the presence of women in the labor market with metropolitan areas (corresponding to the "attractive" labor markets) to the detriment of rural zones (which are

strongly present in "marginal" labor markets). Our data are mostly descriptive and do not provide elements to support conclusive explications for these differences, but suggest the presence of both economic and cultural explanations (that largely interact). On the economic side, we can assume that metropolitan areas offer more numerous and more various job opportunities, especially for high-qualified workers. Even if they refer to a specific population, the results in the second part of chapter 3 support this view. Workers, in general, and high-qualified workers, in particular, move from "marginal" to "attractive" labor markets. A larger and diversified labor market needs more workers, while a reduced one implies a choice inside the workforce. Historically, women (together with foreigners) were considered an "expendable" workforce (Flückiger et al. 2006; Gerfin and Lechner 2002; Giugni et al. 2014). Consequently, it would not be a surprise that echoes of these old practices remained in labor markets with a limited offer. In these cases, the choice would go in favor of a traditional workforce: men. This hypothesis is in accordance with an interpretation of female careers that relies on cultural models. Switzerland has a low protection for working mothers, and "deep-rooted gender stereotypical views on women's lack of work commitment" is largely present (Buchmann et al. 2003). Given the larger presence of conservative attitudes in the peripheral and rural areas, with respect to urban territories (OFS 2012), we can hypothesize that these conceptions are more widespread in "marginal" labor markets than in "attractive" ones. Given a cultural context less favorable to valorize their careers, women find stronger difficulties in competing with men in the labor market. This difference is especially harsh after a life course turning point, as we have described in chapter 2 and 4.

Summing up, our results confirm a strong gendered division of Swiss labor market. Women appear to be often the disadvantaged group especially in the periods around a life course turning point. Nevertheless, this situation is not homogeneous and it interrelates with other elements both at the personal level (e.g. the individual qualifications) and at the contextual level (e.g. the structure of the local labor market). Policies that want to act on these differences must approach the problem from a contextualized perspective that integrates individual work trajectories and their specific economic contexts.

Longitudinal relations across the life courses

In the theoretical chapter, we have stressed the importance of the study of longitudinal relations across the life courses. Despite longitudinal relations being one of the basic elements of life course approach (Alwin 2012; Elder et al. 2004; Levy and Bühlmann 2016; Sapin et al. 2007), certain characteristics of these relations remain debated or understudied. In particular, we have discussed the presence of

social inertia, and the role of expectations as instruments to link causes and effects across individual life courses. Our analyses provide an empirical support for these concepts and suggest their potential utility in life course analysis and policy evaluation.

Social inertia describes the capacity to resist a change and to remain in a certain status. In our analyses, we have discussed the presence of this phenomenon in the third empirical study (chapter 4). In the conclusion of this chapter, we confirm previous research (Aeppli 2012) that showed that the Swiss reform of maternity leave had little to no effect on mothers' work trajectories. We have motivated this result with a lack of family-friendly welfare and, especially, with a modest change in the length of the maternity leave. The new law incremented the length of the leave up to 16 weeks, but, in many cases, the increment was much shorter, and, sometimes, even negative (Aeppli 2012). Rephrasing this statement, we can say that the reform was not strong enough to overcome the social inertia that maintains a certain structure of individual work sequences. This interpretation is not new. For example, Bourdieu's "hysteresis effect" (Bourdieu 1977, 1985; Walther 2014) is one of the best developed concepts describing social inertia. Nevertheless, its application in life course studies is often reduced to the technical issue of path dependency (Nelson and Winter 1982). Our results suggest that the concept of social inertia could have a larger space in life course analysis, especially as it refers to the evaluation of social policies on individual life courses. Similarly to what happens for the literature about the optimal length of maternity leave (Akgunduz and Plantenga 2013; Pettit and Hook 2002), life course analysis can discuss the characteristics of a policy to overcome social inertia. Moreover, the roots of social inertia are to be traced in the cultural models and in the economic structures, making social inertia a bridge concept that allows a discussion of social policies that is sensitive to territorial contexts and individual life courses.

Individual expectations of the future and their role in the definition of life courses are the second element that we have discussed in relation with the longitudinal dimension in the life courses. The results of chapter 4 provide an empirical ground to discuss the role of individual expectations. Focusing the attention on parents that change the amount of weekly working hours in the four years around a childbirth, we observe three different patterns. The first depicts parents that change their amount of weekly working hours in correspondence with, or just after, a childbirth. This pattern is well known. In particular, numerous research describes the transition of new mothers from full- to part-time job positions (Giudici and Gauthier 2009; Le Goff et al. 2009; Widmer et al. 2005), a trend that is also present in our data. Besides this pattern, we have recorded two others that are less frequently described in the existing literature. A minority of Swiss parents passes from a part- to a full-time job position far before the childbirth. On the contrary, a minority of Canadian parents increment their weekly working hours months before the childbirth. In both cases, we observe a clear

effect of expectations. Observing anticipatory strategy is not surprising. Nevertheless, two elements stand out. The first refers to the extent of these strategies. We observe changes in the amount of weekly working hours several months before the childbirth, sometimes before the conception. We did not control for the presence of other life course turning points but the systematic presence of these patterns suggests a link between the childbirth and the changes in the amount of weekly working hours, at least for part of our sample. The second element that rises from the analysis is that some strategies seems to be context-specific. We observe neither an increment in the amount of weekly working hours in Switzerland nor a decrease in British Columbia. Our sample is not representative of the entire population; consequently, we cannot exclude the possibility that a minority of Swiss parents follow the "Canadian" strategy, and vice versa. Nevertheless, the absence of these strategies in sets of sequences otherwise consistent with what was observed in representative samples (Giudici and Gauthier 2009; Le Goff et al. 2009; Widmer et al. 2005) suggests that they are strictly connected with the Canadian and the Swiss social context. This result supports the hypothesis that cultural models shape individual expectations (Luckmann and Schutz 1973) and provide further empirical evidence for the longitudinal analysis of the effects of turning points across life course domains (Bernardi et al. 2017).

The introduction of expectations in the interpretive frame brings further elements to both the scientific discussion and the eventual political applications. When it comes to the theoretical discussion, expectations can be included in the discussion about individual agency (that we have largely exposed early in this chapter). The effect is twofold. One the one hand, possible future experiences cannot be ignored. Independently from the paradigm that we apply to the analysis of agency, we need to study how they influence the decision-making process. On the other hand, the relation between individual decisions and the surrounding context became more articulated. If decisions are taken in advance, they could reflect a context that is no longer what we observe. In particular, all the decisions that have a delay between the moment they are taken and their effects (such as having a child) can be particularly affected by this shift. Regarding the implications for possible policies, the presence of expectations implies that structural reforms that include long spans of individual lives could be more effective than isolated actions focused on specific turning points.

Policy applications

We conclude our thesis by briefly recapitulating the possible role of our results in the creation of evidence-based policies. We have already introduced these applications in connection with each

specific issue that we have presented in this conclusion. In this last section, we briefly collect all the different sparks in a single body of comments.

Evidence-based policy making has a precise structure based on information gathering and trial-based evaluation (Davies, Nutley, and Smith 1999; Plewis 2000; Sanderson 2002). Our thesis provides empirical evidence on policy-relevant issues such as unemployment effects on individual careers, differences in regional labor markets, and maternity leave support. All these pieces of information can be precious for further research on these subjects and be used for future policy tests. In addition, in chapter 4, there is a test of the effect of the recent Swiss and Canadian maternity leave reforms, that follows the structure of evidence-based policy making evaluations (Head 2010). The situation before and after the reforms are compared using a foreign context as control sample. Also, the characteristics of each reform are evaluated and possible weak points individuated making counterfactual hypothesis. The result is a (rather simple) evaluation of these two reforms that, on general terms, is in line with previous researches and add new elements that can be used as a starting point for further testing.

In general terms, our thesis addresses two main indications for policy makers. The first refer to the variation of the effects of life course turning points depending on individual characteristics. In line with the vast majority of life-course literature, individual characteristics embrace socio-demographic statuses as well as a wide range of transitory statuses that include being in a prestigious job position or not, having children, being unemployed for a long or a short time, and many others situations. The second indication is about the necessity of a large time perspective to fully identify the targets of social policies. Our data provide empirical support to the theoretical statement that each life course transition is part of a larger process (Abbott 2001). Individual strategies to face life course turning points are often spread on a period of time much larger than the turning point itself, including previous experiences and expectations on the future.

Stressing these two indications in a research context is trivial as a large part of social research is about the differences between groups, whatever defined. Nevertheless, they are not secondary remarks for policy makers. Leaving aside sloppy policies made for electoral purposes or following purely ideological claims, most of the social policies has to deal with two opposite necessities: on the one hand, policies need to be adaptable to different individual situations, on the other hand, they need to include general issues, in order to be easily implemented on a large population. The two just exposed indications require a stronger attention for differences (among individuals or in time) to the detriment of a larger applicability. Obviously, addressing all the specific elements stressed in our thesis (or in most of the scientific literature) would require a level of precision that is impossible to successfully

translate in political actions. Nevertheless, our observations suggest at least two considerations that can be realistically applicable. First, the goals of each policy have to be put on the center of the political action leaving more room to the instruments to reach these goals to adapt to individual situations and contexts. Norms that are completely individually tailored are not manageable. Nevertheless, leaving space for a certain degree of adaptation in the instruments used to realize social policies could make these policies more easily applicable to different situations and, thus, more effective. The second consideration refer to the structure of the policies. Structural reforms that coherently influence many aspects on individual lives should be preferred to isolated actions focused on specific life course turning points. If life course turning points are part of a process, policy makers need to influence the entire process and only what happen before or after the turning point. For example, our analyses of parents' careers around a childbirth clearly show the need for policies that both reduce the constrains to parenthood (before the childbirth) and help parents to conciliate their job and their new family duties (after the childbirth). In addition to the longitudinal dimension, structural reforms are more effective as they influence the life course domains that are strictly correlated. For example, our discussion on women potential vulnerably around life course turning points is also linked to a mismatch between family and labor market policies. Large structural policies are very risky, and solutions that fits all the contexts are utopian. Nevertheless, the example of other countries can provide useful indications of precise elements. Similarly to what it is done in the literature on maternity leaves (see chapter 4), reforms with similar objectives can be compared to identify few concrete elements that are essential to reach the pre-defined objectives, and overcome the social inertia.

What we have just discussed are general issues that are not strictly linked to the Swiss context. Next to these elements, our results give also few specific indications that can be useful for Swiss policies. First, in chapter 3, we have observed a flow of workers among Swiss local labor markets. These movements are not random but linked to individual and labor market characteristics. The more the labor market is connected with international economies, economic activities with high added value, and dynamic labor markets, the more high-qualified workers move to it. At the contrary, areas with opposite characteristics weakly attract workers, especially among the best qualified. These dynamics reinforce the differences among Swiss areas generating potential geographical inequalities. If a reduction of territorial disparities is in the intentions of the legislator, this result suggests the implementation of rebalancing policies could prevent a trend toward future severe disparities among Swiss regions. A second cue refer to the potential vulnerability of highly-educated workers. Few researches (Korber 2013; Li et al. 2000; Oesch and Baumann 2015; Weber 2006) have already observed that highly-educated workers have more difficulties in their careers with respect to workers

with a medium-level education (especially vocational training). Our results (chapter 2) confirm that highly-educated workers have a stronger likelihood to fall in long-term unemployment. This is a group that is not traditionally considered exposed to potential vulnerability. Consequently, new welfare policies have to reconsider their target groups and adjust their measure to include highly-educated workers and, possibly, others new groups. A third and final element refers to women vulnerability in the labor markets. As we have largely discussed in this conclusion, women are more vulnerable than men around life course turning points, especially, if they are on unusual work patterns. Eventual new social policies have to consider this cleavage in the population and, if it is considered excessive, act to reduce it. In this last case, more incisive policies to sustain women choices across their life courses (and, especially, their employment trajectories) has to be implemented.

In this thesis, we have used the analysis of work trajectories as a privileged point of view to observe the relation among different life-course domains and the socio-economic contexts. Specifically, we have analyzed the changes around two life-course turning points, unemployment and childbirth. These transitions reveal elements of the individual agency and the relations among different life-course domains and between individual life-courses and the surrounding social context. Our analyses confirm many results previously observed and, especially, added new elements that contribute to life course studies and provide empirical evidence for future social policies.

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