# Studies on Human Resource Management Practices for Flexibility

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# Abstract

Flexibility is a term that recalls many different aspects in the life of organizations and employees. This thesis explores two different forms of flexibility to understand whether it can be strategically used by Human Resource Management as a tool to increase the performance of organizations. The first chapter of this thesis is conceived as an introduction to various forms of flexibility with a particular focus on numerical and temporal flexibility, which are at the core of Chapter 2 and Chapter 3.

Chapter 2 analyzes aspects linked to numerical flexibility, namely the possibility of organizations to adjust workforce. The wider use of non-standard forms of employment of the last two decades and the economic crisis that characterized the last fifteen years changed the paradigm of the standard open-ended contract. As employers more frequently resort to more flexible arrangements to adjust to changing market conditions, it is crucial to understand the drivers of these choices and whether atypical contracts are distinctive to low skilled jobs or HRM practices can make a difference. Chapter 2 specifically explores the linkages between specific characteristics of job and the deployment of atypical contracts. While previous literature highlighted the effects of single characteristics in the choice of employers towards permanent or atypical contracts, we bring together various characteristics that create configurations that can explain these choices using fuzzy set qualitative comparative analysis (fsQCA). We found evidence that firms limit the deployment of atypical contracts not only in case of firm-specific and complex tasks, but also in case of simple and non-specific tasks when supported by HRM practices aimed at increasing internal flexibility. Firms can take advantage of a stable workforce by strategically using HRM flexibility practices as an alternative to numerical flexibility.

Chapter 3 deals with the issue of temporal flexibility and is addressed in this thesis as a kind of flexibility that brings together the needs of both employees and employers. On one hand, the stronger request for autonomy and an increased work-family balance of employees brings organizations to increase the availability of programs and benefits to accommodate workers' needs. On the other hand, these programs have proved to have positive effects on various job outcomes such as job satisfaction, motivation and performance and reduced absenteeism and turnover and therefore might be used by organizations to increase individual performance.

Especially in a context like the public sector, that doesn't allow great monetary incentives due to budget constraints, flexibility programs should be considered important tools to increase job outcomes. The implementation and the real effects of these programs, however, remain important topics that need to be addressed, as if not specifically tailored, these measures might not lead to the expected result. Chapter 3 deals with the effects of a flexitime program on absenteeism, overtime and hours worked using panel data from an Italian public health agency. We use a conditional DiD model and a flexible conditional DiD model to investigate how employee's behavior changed in a four-year time period and the year right after entering the program. We found no results supporting the idea that the mere implementation of the program helps to reduce absenteeism. We argue that because individual motivational aspects might be the reason behind our results, organizations need to consider individual characteristics in order to obtain positive results from flexibility programs.

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# Introduction

In 2020 the world began to face the worst health emergency of the last century, which affected many parts of people lives and seriously challenged the notion of what will from now on be considered "normal". The strict rules imposed by governments all around the world to avoid the spreading of the Covid19 forced employers in what are considered non-essential activities to either stop their activity or change drastically the ways in which jobs are carried out, which lead to an economic crisis even worse than the 2008 global financial crisis. In the first three months of the pandemic GDP in OECD countries fell by 15%, hours worked fell ten times more than the same period in 2008 and the unemployment rate gained three points in five months, reaching 8.4% in May 2020 (OECD 2020).

The world pandemic highlighted even more how employees are crucial for the good functioning of organizations and the rapid changes of the 21st century, linked for example to the use of technology and AI or the constant growth of contingent work, are also changing the nature of work itself (Barley et al. 2017). In this new context human resource management (HRM) needs to adapt its strategies to attract, develop and retain employees, as human capital is a major source of competitive advantage for firms (E. Starr et al. 2018). One of the strategies implemented by organizations is work flexibility, which is also highlighted in the European employment strategy (European Commission 2010).

This thesis, hence, addresses two very different aspects connected to work flexibility using both different databases and both qualitative and quantitative methods to answer specific research questions. It is comprised of three essays which explore work flexibility matters in Italian firms, belonging to both the private and the public sector.

The first chapter of this thesis is an overview on the different forms of flexibility that firms can resort to, namely the flexibility which can be gained by adapting workforce and the

flexibility given to employees when carrying out their daily tasks. Since the third chapter focuses on the analysis of flexibility tools in the public sector, the first chapter also includes an important section as an introduction to New Public Management and the main differences with the private sector. The aim of the entire chapter is to focus on why flexibility is considered an important matter in labor related issues and can be used as a strategic HRM tool by organizations, thus laying the background context for the subsequent chapters, which present two distinct applications of flexibility in the workplace.

Two distinct work flexibility issues affecting firms' decisions and employees' organization of the job and well-being are at the core of the second and third chapter of this thesis. Specifically, the second chapter addresses the numerical flexibility theme analyzing how the combination of different job characteristics may limit the deployment of atypical contracts. chapter 3 will investigate temporal flexibility through the analysis of the effects of a flexitime program in an Italian public health agency from 2015 to 2018.

The following are the detailed summaries of the two chapters.

(a) The second chapter focuses on the drivers that brings firms to hire employees with an atypical or standard contract. As previously mentioned, firms often make use of numerical flexibility to adapt to market volatility that comes at the expense of unskilled and unspecific labor, which is easier to draw from the market because of its lower costs. This chapter investigates how it may be possible to trade off flexibility costs and long-term competitiveness by using better HRM strategies. Much has been written on the relationship between single HRM dimensions and the deployment of atypical contracts, while this study suggests that it is not a matter of single job characteristics but rather a combination of characteristics that determines firms' choices towards one of the two kinds of arrangements. Moreover, we try to identify which combinations of characteristics are able to limit the deployment of atypical workers.

We conducted 39 interviews across 17 service sector firms in North-East Italy, focusing on different aspects of several occupations inside the selected firms. In particular, we gathered information on six aspects, namely job rotation, firm-specificity of tasks, the simplicity or complexity of the job, working time flexibility, market stability and predictability and the overall deployment of atypical contracts. We identified 34 occupations and used fsQCA for the analysis. First, we turned data on each occupation and for all the variables of interest into

a four-value fuzzy set, where the coding process (called calibration) was based on previous knowledge and researchers' judgement. The final step was the analysis of sufficient conditions that measures to what extent a reduction in the use of atypical contracts is casually related to our variables. The result was the identification of three configurations that are able to limit the deployment of atypical contracts. While the first and the third configurations confirm the idea that more complex and firm-specific jobs are carried out by permanent workers, the second highlights how even simple, non-specific jobs, which however make a strong use of job rotation, may be more easily carried out by permanent instead of atypical workers. This result sheds new light on the drivers of firm' choices implicating that complexity or specificity of jobs may not be enough to guarantee a permanent contract. Instead, it is the combination of different factors and a strategic use of HRM practices such as job rotation that are able to encourage firms to hire employees permanently, even in the presence of unskilled workers. Therefore, well-designed HRM practices are able to change the trade-off between numerical flexibility and the preservation of human capital, as our results show how firms can respond to changing market conditions with specific HRM practices according to different jobs, instead of adjusting their labor force.

(b) The third chapter focuses on temporal flexibility and in particular the effects of a flexitime program on absences and hours worked. In paragraph 1.3 it was discussed how the benefits of temporal flexibility are mainly due to higher autonomy perceived by workers, which translates in positive outcomes for job satisfaction, motivation, absenteeism, turnover and performance. Because autonomy also reduces work-family conflict, HRM practices that allow workers to manage part of their job themselves have become increasingly popular among firms and employees. Especially in a context such as the public sector, which is subject to budgetary constraints that don't allow big monetary rewards, HRM practices should be taken in high consideration in order to improve workers outcomes and ultimately performance.

Using a panel dataset of workers belonging to an Italian public health agency from 2015 to 2018, this study observes the changes in absences and hours worked of workers who joined a flexitime program and the differences with changes of workers with a standard schedule. The analysis was carried out in three different steps that allow to gain an increasingly detailed picture of the effects of the program. First, we conducted a Wilcoxon sign-ranked test on

people who entered the program to see whether outcomes in hours worked, overtime, sick leave, training hours, holidays, other absences and overall total absences changed in the year just after entering the program. Second, after matching people who joined the program and people who did not, we analyzed the changes in outcome results along 4 years in a difference-in-difference framework, finding only relevant changes in holidays. Finally, we refined the second step by allowing the DiD framework to take into account the fact that we have people entering the program in different years and checking for significant differences in the year after entering the program. The results in this final step are significant only for overtime hours and are robust with both exact and non-exact matching. Given these results, the contribution of this study is twofold. First, we use longitudinal data and a quasi-experiment setting to perform our analysis, whereas previous studies usually make use of self-reported answers to capture the effects of working time flexibility measures. Therefore, we are able to provide a different take on the existing literature. Second, we argue that the significant changes in holidays and overtime hours might be a result of different motivation levels of employees who enter the program. When given the possibility to have more control over their working schedules, less motivated employees might decide to use flexibility tools to accommodate their personal needs and become less inclined to answer organizations' needs. Therefore,flexibility measures alone may not be enough to exhibit positive organizational outcomes but need to be carefully designed taking into consideration also personal characteristics in order to guarantee overall better performances of firms.

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# Chapter 1

# Work and Flexibility

## 1.1 Forms of Flexibility

Labor market flexibility is a broad term which refers to very different aspects and can take different forms depending on how it is conceived. De Hann et al. (1995) recognized four different forms of flexibility resulting from the intersection of two couple of dimensions: external/internal and qualitative/quantitative flexibility. The external/quantitative flexibility is called numerical flexibility and refers to the possibility to adapt workforce by resorting to different types of contracts, while the external/qualitative flexibility is called productive or geographical flexibility and deals instead with different options of external production, such as outsourcing or subcontracting. Internal/quantitative flexibility is the so-called temporal flexibility, which distinguishes the various working time arrangements such as part-time work or flexitime, and internal/qualitative flexibility is called functional flexibility, which deals with the organization of the job in terms of job rotation or job enrichment (Goudswaard and Nanteuil 2000). These four categories of flexibility identify possible needs and preferences of employers and employees. On one side we find employers' demand for flexibility when they find themselves in the need of adjusting workforce or relocate to follow market demand, but also to deal with different flows of customers during the day or week or to make the most out of employees' capabilities. On the other side instead, we have employees' demand for flexibility when they wish to adapt their contract or schedule to their own needs or preferences, or when they ask for richer job experiences that allow to change tasks performed and have more control over their job. Thus, it is crucial to understand how different needs can be

met and whether HRM practices can match flexibility demands of employers and employees in a bundle that leads to positive overall performances. The term flexibility linked to labor market and workplace issues and the idea that forms of flexibility can be created for both employers and employees leading to increased performance (Spreitzer et al. 2017) is very popular. However, according to the subject analyzed in research, flexibility issues are developed in different streams of literature largely separate from each other (Bal and Jansen 2016). When dealing with numerical and geographical flexibility, research focuses on the ability of organizations to adapt to changing environments, emphasizing the aspects linked to how operations and decisions change as the general belief is that increased flexibility allows to compete in the market at a higher level. In this stream of literature, the focus is mainly on the demand of flexibility from organizations, where the external factors affecting organizations' practices are crucial. Those aspects are largely investigated in strategic management research, which analyzes for example contractual flexibility, pay, relocation or distribution strategies. The literature on internal flexibility instead, focuses its attention on workers' demand for flexibility and work conditions inside organizations. Differently from research on external flexibility, research on internal flexibility is developed in the field of strategic human resource management where flexibility is considered either a skill that workers can develop to better meet organizations' demands or part of a pool of practices that employers can resort to in order to improve working conditions and expecting better individual or group performance (Bal and Izak 2021). The different perspective on the meaning and use of flexibility have therefore distinct frameworks and require separate background concepts in order to be addressed. Considering the four categories previously mentioned, this thesis focuses on numerical and temporal flexibility, investigating how HRM practices can bring organizations' and employees' demand for flexibility closer to each other. In chapter 2 we deal with firms' need to adapt to market pressures and employees' need of stability, while in chapter 3 we deal with a public agency's need to improve output performance measures with employees' need for an improved work-family balance. In both chapters we stress the idea that the different needs of employers and employees in terms of flexibility can come together to create a win-win situation for both parties. Moreover, the use of HRM practices can better answer to changing environment conditions, allowing interventions without resorting to the market. On one side, by internally adjusting workforce with the use of HRM practices,

employers won't need to hire or fire employees to meet their demand; on the other, employees will increase their work experience because of an increased fit between personal preferences and tasks demands. The following sections each provide the framework for the subsequent chapters, that reflect the heterogeneity in the literature around different forms of flexibility. In section 1.2 we focus on the concepts linked to numerical flexibility presenting different contractual forms and the debate around flexibility of the labor market. Section 1.3 instead, deals with aspects of internal flexibility, specifically on the link between autonomy and flexible working arrangements, which is one of the most popular explanations of the success of flexibility practices in the workplace. As the third chapter of this thesis analyzes the case of temporal flexibility in the public administration, Section 1.4 is dedicated to the evolution of Public Management that led to significant changes in HRM practices in this sector, and how flexibility can be integrated in those practices to achieve better performance.

## 1.2 Flexibility and the Labor Market

The issue of numerical flexibility arises from the departure from the classical standard form of employment which existed for the major part of the twentieth century and consisted in a "stable, open-ended and direct arrangement between a dependent, full time employee and their unitary employer" (Stone and Arthurs 2013). Nowadays it is harder to find people who enter the labor market and maintain their position with the same company until retirement. According to Schoukens and Barrio (2017), the main features of the standard contract are "the standard employment relationship, labor stability, income security and the protection of labor legislation and collective agreements", which have been increasingly challenged by several factors such as technology advancements, the rise of Non Standard Forms of Employment (NSFE) (also due to an increased attention to work-family balance) and decreased employment protection (OECD 2013). In particular NSFE cover the wide spectrum of employment possibilities that allow firms to practice numerical flexibility. According to the International Labor Organization (ILO) it is not possible to give a single definition of NSFE, but it is considered as such "any arrangement which falls out of the standard model of employment" (ILO 2015). Even though the rules governing these kinds of arrangements are usually different according to the country in which the contract is signed, some of the most widely known NSFE are the following. First, temporary employment (or

fixed term contracts), which distinguishes contracts with a fixed duration period including project- or task-based contracts, seasonal and casual work. Then, there is temporary agency work, which refers to arrangements in which employees are formally employed by an employment agency, but actually work for one of its client firms. Part-time contracts instead, are contracts in which the hours worked are reduced compared to a full-time contract. Lastly, there are ambiguous employment relationships, indicating arrangements allowed by particular country legislations that open to different interpretations which make them difficult to classify. An example could be that of dependent self-employment: workers follow the directions of one firm in order to perform their job and are dependent on that firm or on specific and limited clients for their income, which is a form of subordination that distinguishes these arrangements from standard self-employment.

The existence of this wide range of NSFE provides firms with the possibility to adapt their workforce according to their needs, the most common of which is market volatility. The need for higher labor market flexibility has become an increasingly widespread view starting from the 1980s (Monastiriotis 2006) based on the idea that rigidities imposed by national legislations prevent markets from finding their equilibrium, thus creating distortions in employment and growth. In this sense, labor market flexibility is seen as a solution to both improve overall competitiveness of countries, especially for those with a relatively low level of labor market freedom such as European countries (Zemanek 2010), and reduce unemployment (Di Tella and MacCulloch 2005). In practice, increasing labor market flexibility involves reforms in several areas such as employment and unemployment protection legislation or collective bargaining (Liotti 2020). A broader set of options when hiring new workers also offers several advantages for firms. First, a less rigid labor market allows firms to gain more control on the employment relationship and allows them to adjust their overall costs in case of negative shocks (DiPrete et al. 2006). In this way, not only the costs related to hiring, firing or training atypical workers are usually reduced (Nesheim et al. 2007), but firms are able to adjust to business-cycle fluctuations such as lower seasonal demand that requires lower workforce (Harrison and Kelley 1993). In fact, if firms hired using mainly permanent contracts, they would bear higher costs for substituting sick workers or paying salaries during periods of low demand. Other advantages include the reduction of recruitment or supervision of workers because of the possibility to outsource these tasks to specialized firms (Kalleberg,

Reynolds, et al. 2003), and the ability to screen candidates before hiring them permanently. Finally, flexibility of the labor market creates the possibility to better cope with technological changes. Some jobs have drastically changed, new ones were created because of emerging needs of firms and customers, while others can be carried out in virtual mode, making the standard employment relationship harder to apply.

The effectiveness of labor market flexibility is still a debated issue. Lazear (1990) in his study on 22 developed countries, found that the presence of severance pay is negatively related to the employment rate and positively related with the unemployment rate. Similar results were reached by Di Tella and MacCulloch (2005) even though the evidence of the relationship between flexibility and unemployment is less evident. Bernal-Verdugo et al. (2012) highlighted how unemployment levels usually reached after a financial crisis are generally lower but long lasting in countries with rigid labor markets. Instead, in countries with more flexible labor markets unemployment levels tend to fade in the medium-long term, even if they reach higher levels in the beginning. These results are also consistent with the 'unified theory' (F. D. Blau and Kahn 2002), which argues that institutional differences among developed countries are able to explain the different trends when facing macroeconomic shocks. While rigid labor markets such as the ones we find in European countries are able to maintain relatively stable real wages and relative wages while experiencing high levels of unemployment, more flexible labor markets like the US experience lower levels of unemployment at the expense of lower real wages and higher wage inequality.

In Europe, this translated in an increased use of in contingent jobs, particularly for low skilled jobs (DiPrete et al. 2006). Figure 1.1 displays the number of standard and atypical contracts in Italy in the last 25 years. Atypical contracts increased more than standard contracts as an effect of the "pacchetto Treu" in 1997 and Biagi law of 2003, which increased labor market flexibilization. In particular, it is worth noticing how after the 2008 financial crisis the labor market shrank starting from 2009, but in 2010 atypical contracts increased even though employment was still decreasing, meaning that in order to cope with the effects of the crisis, employers were shifting from standard contracts to atypical contracts. For firms, it became easier to draw new labor force from the market especially for those tasks which are neither difficult to perform or firm specific, which, for example, is the case of most seasonal jobs. Unskilled workers became the ones more easily hired with temporary

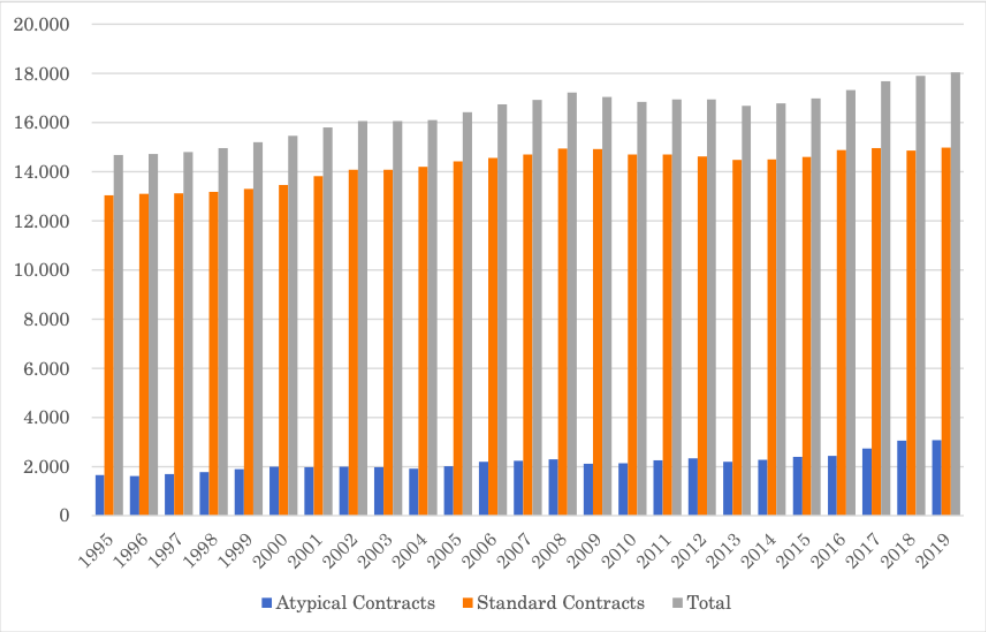


Figure 1.1: Types of contracts in Italy from 1995 to 2019 (thousands) Source: ISTAT (http://dati-congiuntura.istat.it/)

contracts and in time the use of these contracts became more commonly associated with a low skilled job (Cappelli and Keller 2013). In Italy atypical workers are in general better educated compared to workers holding a standard contract, mainly because most atypical workers are young and because they have a low experience (Bardazzi and Duranti 2016; Caroleo, Pastore, et al. 2007). Barbieri and Scherer (2009) in their study of the Italian case, found that it is especially young workers who risk to remain stuck in atypical employment and that market flexibilization did not create new jobs, but only substituted secure jobs with cheaper and non-unionized jobs. Liotti (2020) argued that flexibility measures in Italy did not increase employment among young workers, but increased unemployment rates instead. Labor market flexibility also seems to affect firm productivity. There is evidence of the negative impact of atypical work on productivity (Boeri and Garibaldi 2007; Lotti and Viviano 2012), but this might occur because of different reasons. Workers with temporary contracts might be more willing to put more effort in their jobs in order to increase their chances to be hired permanently, but if the chances are very low, effort may decrease as an effect of discouragement, with a consequent negative impact on productivity (Ghignoni

2009). Contingent workers will also develop less firm specific skills and will go through a lower amount of training (Cabrales et al. 2014) because of the lower willingness of employers to invest in training when the duration of the contract doesn't allow to exert its positive effects. However, (Bardazzi and Duranti 2016) found that motivational issues and lower training are only present in small firms, where employers are more prone to using atypical contracts in pursuit of a cost-cutting strategy, while larger firms usually use them as steppingstone in order to obtain a permanent contract, which means higher investment in training and higher worker motivation.

Chapter 2 specifically addresses the issue of atypical contracts and their deployment in Italian firms. We investigate whether the general idea that atypical contracts are used as part of a cost cutting strategy holds or whether a strategic use of HRM practices allows firms to make use of numerical flexibility in a different way and potentially limit the deployment of atypical contracts especially for low skilled jobs, which are more often associated with this type of contracts. The paper analyzes an external from of flexibility starting from the characteristics of jobs, which are typical elements also considered in the internal forms of flexibility, bringing together streams of literature that often remain separated (Bal and Jansen 2016). The chapter will give an example of how employers' demand for flexibility who typically adjust workforce according to their needs, is in this case matched with employees' demand for stability resorting to HRM practices that also affect individual work outcomes. The next section specifically introduces the link between work flexibility and the Job Characteristics Model developed by Hackman and Oldham 1976 and how it opens to practices that can increase organizations' performance.

## 1.3 Flexibility in the Workplace

In the previous section internal flexibility was defined as flexibility measures available for employees in the organization of their job. This concept suggests that flexibility can be implemented through a variety of different measures dealing with different aspects of jobs, namely time, space and organization. This form of flexibility is what Hackman and Oldham (1976) define as the Autonomy dimension in their Job Characteristics Model (JCM): "The degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in

carrying it out.". The important outcome of their study is the connection between job characteristics and several outcome variables such as job satisfaction, motivation, quality of work performance, absenteeism and turnover, that the authors integrate in a single concept of meaningfulness of the job. This includes job flexibility in its various forms. Strictly connected with the JCM there are the concepts of job design, defined as the contents, methods and relationship of jobs that are assigned to individuals in an organization (Ilgen and Hollenbeck 1991) and job crafting that directly involves employees in shaping their jobs, which both allow to increase meaningfulness of jobs and consequently improve employees' and firms' outcomes. In particular, job crafting shares the traits of the autonomy dimension of the JCM as there are three different forms of job crafting (J. M. Berg et al. 2013). The first is task crafting, in which employees are able to alter the responsibilities prescribed by their job description by adding or dropping tasks, altering the nature of tasks or changing how much time, energy and attention are allocated to various tasks. Then, there is relational crafting in which employees can change how, when or with whom they interact in the execution of their jobs. Finally, cognitive crafting which involves employees' change in their way of perceiving their own jobs. A recent study by Muecke et al. (2020) theorizes that job autonomy affects work engagement mediated by challenge demands. In particular, the authors argue that job autonomy increases challenges on the workplace which might lead to positive effects, such as employees displaying higher work engagement, but also negative effects as for some individuals increased challenges lead to emotional strain. As previously mentioned, autonomy therefore can touch several task elements such as methods of working, pace of work, procedures, scheduling and work criteria (De Jonge 1995). Possenriede and Plantenga (2011) distinguish three types of Flexible Working Arrangements (FWA): flexibility in scheduling, location and length of work (part-time) and conclude that these different types act independently to improve job satisfaction, with autonomy acting as a mediator.

Flexibility in the workplace that can be reached thanks to an increased autonomy, is now becoming an important factor for employees when they need to decide whether to maintain a job or not. In the 2017 report on the State of the American Workplace, the analytics and consulting company Gallup highlighted how flexibility is now one of the most important elements for employees: 51% of workers report they would be willing to change job to get flexible working time, and 37% would change job to get a flexible working location for part

of their working time. Among the office features, flexible work time is the most sought after, and employees working remotely not all, but at least part of their time report higher levels of engagement than colleagues who never work remotely. Moreover, flexibility preferences seem to be higher among millennials, who are generally more interested in benefits that highly impact their lives and those of family members. In a recent study on smart workers in Italy Angelici and Profeta (2020) discovered that employees who were able to decide their working time and space for one day per week put more effort and displayed higher levels of job satisfaction. Because earnings were not affected by the program, these results show that employees were willing to exchange more effort for more flexibility, in order to increase job satisfaction levels. Flexibility also seems to be able to limit work-life conflict and reduce emotional exhaustion, even with small adjustments on the firm's side, for example like leaving the workplace for a few hours or having flexible break arrangements (Buruck et al. 2020).

However, flexibility measures also come with some difficulties and challenges. First, the relationship between flexibility and several work performance outcomes is not always positive. The literature reports mixed results (De Menezes and Kelliher 2011), although these measures are becoming more and more popular among firms and employees. One of the possible explanations of the contrasting results might be the essential misfit between personal and task demand with flexible arrangements (Wessels et al. 2019). In fact, the flexibility demanded by workers might be incompatible with the tasks assigned by employees, resulting in decreased overall performance. This indicates that if firms wish for employees to perform well, jobs need to be matched not only to employees' skills, but also to personal flexibility demands. Thus, for FWA to be more effective it would be convenient not to consider them as standard measures to apply indistinctively to all employees, but rather as measures that need to be understood and selected together with employees in order to find the right fit for each individual. Moreover, several studies reported difficulties by both employees end supervisors in implementing flexitime, which is one of the most popular forms of FWA. Employees might find it challenging to maintain productivity, managing time or set boundaries between work and personal life. At the same time, managers might face new challenges in communicating with subordinates and measure performance, with possible consequent impact on organizational outcomes (Downes and Koekemoer 2011). The third chapter of this thesis analyzes the effects of a flexitime program in the public sector where the choice of entering

the program is left to single employees. This means that except for general guidelines there was no particular selection of employees based on their preferences or their specific tasks, and in the case employees are eligible, supervisors must adapt, facing potential challenges linked to the new arrangement. However, due to higher budgetary constraints, the public administration should consider improving their service through HRM practices (Tuan 2019), also based on the different motivation drivers of public employees (Buelens and Van den Broeck 2007; Perry 1997).

The next section explains the evolution of Public Management and provides an overview of the effects of monetary incentive schemes and why, considered the context, the use of non-monetary incentive schemes such as FWA might lead to even better performances.

## 1.4 Flexibility Plans as an Incentive: the Case of PA

The pressure to remain competitive represent an incentive for organizations to provide worker friendly programs and benefits that can attract high skilled employees (D. E. Schmidt and Duenas 2002). For these employees, the presence of such programs or benefits, such as the ones increasing flexibility, can become a real incentive when choosing an organization over the other. The existence of differences between the private and the public sector in providing and implementing incentives, but also their ultimate effectiveness, needs to be closely addressed before stating that flexibility can play an important role in motivating and increase employees' performance in the public sector.

The main approach to public administration, which was adopted for much of the 20th century, follows the ideas of sociologist Max Weber and is based on the principles of hierarchy and meritocracy (Robinson 2015). This approach implies not only the rational usage of procedures but also of people who need to be organized to pursue objectives in the interests of the public. Public administration is therefore hierarchically divided into trained administrators appointed on the basis of qualifications at the top of the organization and public servants with clear guidelines and the goal to implement decisions taken by governments (McCourt 2013; Minogue et al. 2001). These characteristics altogether were supposed to make the public administration both efficient and effective in the management of tasks and people (Robinson 2015). However, the model proved its limitations in meeting the demands of the competitive market economy. The efficiency of public administration started to be

questioned and the belief that the adoption of private sector managerial techniques would lead to an increased efficiency of services started to rise (Thatcher 1995). The theoretical foundations of New Public Management lay in public choice and the principal-agent theory according to which it is individual preferences that drive bureaucratic behavior. Thus, the private sector, with its focus on competition, delegation and performance, was considered able to provide good standards for public administration regulation and to improve outcomes (Dunleavy and Hood 1994; McCourt 2013). Osborne (2006) summarized the main points as follows:

- an attention to lessons from private sector management
- the growth of both "hands-on management", in its own right and not as an offshoot professionalism, and of "arm's length" organizations where policy implementation is organizationally distanced from policymakers
- a focus upon entrepreneurial leadership within public service organizations
- an emphasis on input and output control and evaluation, and on performance management and audit
- the disaggregation of public services to their most basic units and a focus on their cost management
- the growth of use if markets, competition and contracts for resource allocation and service delivery within public services

In the new paradigm, the public administration is supposed to carry out only the crucial tasks, outsourcing those which can be outsourced, guiding the actions of external parties; to be managed by objectives which need to be measured through performance evaluations; to monitor the resources invested to attain these objectives; to promote organizational learning and the involvement of employees in decision making processes; to make use of pay for performance measures to reward public servants based on evaluations and performances of single workers (Pollitt and Bouckaert 2017). Therefore, also the public sector should follow the rules of competition just like the private sector, even though the final goal should not be profit, but rather the efficiency of the services provided and the satisfaction of citizens, who are considered as final customers of these services. Moreover, the policy implementation structure

of public administration needs to be organizationally distanced from policymakers, separating the implementation functions of the former from the regulation and control functions of the latter. Those principles brought to significant changes in the public administration management, with particular attention to marketization processes and the contracting out of core services to private companies. As a consequence, performance management practices started to be widely used in the public sector (Dunleavy and Hood 1994).

The governance methods which have been used to reach the new goals, however, have been different among countries: the Anglo-Saxon countries placed a bigger importance to the market, focusing more on privatization programs aimed at saving public funds and safeguarding the interests of citizens. Continental Europe countries instead, gave more importance to decentralization issues also according to the subsidiarity principle of the EU (Van de Walle and Hammerschmid 2011).

The different experiences of reforms based on the new paradigm in different countries all have one common trait, which is that of improving the quality of services within the public sector and increase the competitiveness of the system. The public administration therefore shifted from the idea of an organization which performs tasks of public interest to an organization more similar to a firm providing services to citizens, which means that efficiency and efficacy became much more important in the reform process. Individual and organizational performance become crucial in order to reach such goals and measurements of performance become a direct way to understand whether these goals are reached or not.

One of the measures introduced in the public sector as part of the new management system is pay for performance schemes. More than two-thirds of OECD countries and a number of developing countries adopted this practice (OECD 2005) drawing from principal-agent theory, for which a monetary incentive should increase efficiency (S. Burgess and Ratto 2003; Jensen and Meckling 1976). Pay for performance is however not always easy to put into practice also in the private sector, as nowadays most jobs are carried out by teams of workers, and therefore it is hard to understand how much of the final result must be attributed to each of them. Many jobs also involve multiple tasks and, unless rewards are arranged on each task, workers will concentrate on the one that will bring them more benefit. Furthermore, if the reward system is based on relative performance, which means that they are given to a worker who performs better compared to others, the outcome may lead to workers adopting

competitive behavior towards each other in order to reach their own personal goal, rather than focusing on those of the entire firm.

However, there are two distinct views on the effects of pay for performance measures both in the private and in the public sector. The first stems from standard economic theory and behavioral management, which believes that pay for performance measures increase performance when it is correctly implemented (Lehman and Geller 2004). If people are rational, follow their preferences and are extrinsically motivated their behavior can be directed through incentives. In this view, incentives are mainly designed following expectancy and reinforcement theories under the premise that people believe that increased performance is recognized by management, and therefore adjust their work effort on the expectation of future rewards. As a result, this creates a mindset that is reinforced through repetition and establishes the new level of effort as the behavioral norm. Researchers in this area are therefore more focused on the problem of correct measurement of performance which is the key for an effective scheme.

There have been several studies in support of the argument that incentives have a positive impact on output indicators. For example, Stajkovic and Luthans (2003) meta-analysis of 72 studies on the matter found that incentives increase task performance by 23%, while other rewards such as social recognition and feedback are less effective, 17% and 10% respectively. Furthermore, in their analysis the three interventions together seem to be able to increase performance of almost 50%. Reviews on field studies focusing on individual monetary incentives generally indicate the positive relationship between incentives and performance and also between incentives and effort (Foster and Rosenzweig 1994), but not under all conditions (Bucklin and Dickinson 2001; Jenkins Jr et al. 1998). Moreover, monetary incentives seem strongly related to the quantity of output, but not to the quality. When specifically referring to pay for performance schemes, they have been only inconsistently linked to improved outcome. In fact, differences in organization's arrangements, individual preferences for performance pay and individual attitudes are all elements which can affect the final effect of pay for performance plans (Heneman 1992; Milkovich and Wigdor 1991). In addition, workers' behavior aimed at pursuing personal goals is confirmed by a number of studies which suggest that people may act in their own interests even at the cost of overall efficiency (Asch 1990; Brown et al. 1996; Healy 1985). Companies that only focus on motivating employees using

monetary incentives, may get a different outcome from the one estimated. Employees will concentrate on bonuses, but not necessarily to the company's well-being; and since firms are an important part of modern economies this may be one of the keys to understand what makes economies work or fail (Akerlof and Kranton 2010). The main issue is determined by the fact that people do not resemble the typical Homo economicus: taking it as a model on which policies are built could lead to more self-interested behaviors when incentives are introduced than in their absence (Bowles 2016). Incentives may in fact affect individual's social preferences leading to results different from those expected.

The second view stems from psychological economics and self-determination theory and mainly deals with motivation, meant as "the internal mental state pertaining to initiation, direction, persistence, intensity and termination of behavior" (Landy and W. S. Becker 1987). The source of such mental state can be both intrinsic and extrinsic. The former refers to doing something because it is inherently interesting or enjoyable, while the latter to doing something because it leads to a separable outcome (Richard M Ryan and Edward L Deci 2000). So, while in dealing with intrinsic motivation we find that people are keen to do certain activities because they spontaneously bring satisfaction, extrinsic motivation implies that people are in need of some reinforcement in order to do something. In literature, extrinsic motivation has been characterized as an impoverished, although powerful, form of motivation (DeCharms 2013). However, there is difference between completing a task which is extrinsically motivated with resentment, resistance or disinterest and doing it with an attitude of willingness that reflects the acceptance of the utility or the value of the task (Richard M Ryan and Edward L Deci 2000). Under this stream of research pay for performance schemes are believed to potentially have a negative effect which leads to a crowding out or undermining effect on intrinsic motivation especially in people performing "interesting tasks" (Weibel et al. 2010), meaning those tasks which are considered challenging, purposeful and enjoyable by individuals. These effects have been mainly studied in psychology (Amabile 1998; Edward L Deci 1971) and psychological economics. Falk and Kosfeld (2006) for example found that control and explicit incentives diminish the motivation of people to perform well. Bènabou and Tirole (2003) argue that in the case of asymmetric information it is not possible to separate extrinsic and intrinsic motivation. Therefore, when workers are unsure about their own ability, their intrinsic motivation decreases with the level of incentives and

when they are not sure about how exciting tasks are, perceptions are influenced by the size of wages and incentives. Moreover, they argue that incentives can have positive effects in the short term, but always decrease motivation in the long run.

If incentives need to be carefully designed in the private sector, an even more difficult task is implementing the right bonuses in the public sector. New Public Management contributed into bringing performance related pay into the public administration. In the public sector the identification of the relationship between incentives and performance, and consequently the measurement of performance, is more difficult. The public sector differs from the private for several reasons. Indeed, the former usually has multiple project managers, meaning that there are different groups influencing the organization's work and multiple tasks, in a situation in which there is generally a lack of competition. This is due to public sector agencies often not being able to compare their performance with other organizations. In addition, the output is not always perfectly clear as in the case of the private sector, since the same output can be produced by different agencies (or departments), and the same agency can produce different results or participate at the production of different sets of outputs. Another important feature is teamwork: when the output is dependent on the work of several individuals, there is the strong possibility of free riding. This requires even greater attention in the case of large teams and uncertainty in output measurement. Finally, outcomes can be complementary or redundant, produce positive or negative externalities and they are not sold on the market; and if it is sold, it is not at its market price (Festré and Garrouste 2007).

Previous reviews on the public sector analyzing the effects of incentives or pay for performance schemes display generally different results from those of the private sector. There seems to be little impact of these measures on motivation and organizational performance and the relationship between pay and performance is not significant (Durant et al. 2006). For example, Frey and Oberholzer-Gee (1997) conducted a field study which showed that where public spirit prevails, the use of price incentives comes at higher costs than those expected from standard economic theory because incentives crowd out civic duty. Therefore, while it might be a good strategy to use incentives in contexts where intrinsic motivation is absent or has been completely crowded out, all incentives in contexts where intrinsic motivation is present should be carefully reconsidered, especially in the public sector where intrinsic

motivation is generally higher (Buelens and Van den Broeck 2007; Perry 1997). Weibel et al. (2010), in their meta-analysis of previous experimental studies on pay for performance measures in the public sector, found that these measures cause a cognitive shift that increases extrinsic motivation for behavior, which they call a price effect, but at the same time reduces the intrinsic motivation: the crowding out effect. The strength of the two effects then determines the overall effect on effort. The more intrinsic motivation is present in the beginning, the higher the risk it can be destroyed. They also found that if the price effect is stronger than the crowding out effect, hidden costs can arise, because if people cannot be further motivated intrinsically, there is always the need of extrinsic rewards to compensate the loss of intrinsic motivation.

Chen (2018) instead, focused on the size of incentives using data from the US General Social Survey, which gathers data from all sectors. His findings reveal that while the view of "paying little is better than zero" can explain the impact of performance payment size on work effort, the "pay enough or don't pay at all" view can explain the impact on work attitudes. Thus, because it is both effort and attitudes that determine the actual performance of workers, pay for performance measures might not be enough to cause an increase in performance. However, results differ according to the sector, especially in the negative impact of small incentives on work attitudes. In fact, the ideal size of pay for performance measures is much higher in the public and non-profit sector than the private one, 30% and 10% respectively, confirming that in these sectors it would be often best to "pay enough or don't pay at all", showing that public sector workers are more intrinsically motivated than private sector workers. Moreover, the size of performance pay is often little when compared to the private sector, first because the public administration deals with budgetary constraints, which don't allow big rewards; second, because public employees are expected to work for the community and giving high rewards would generate outrage from the public (Miller and Whitford 2007). Another interesting issue is raised by Eremin et al. (2010) who argue that it is also important for public employees to believe in the fairness of the system, as the fairness of the evaluation and rewards also have an impact on overall performance, keeping in mind that people tend to compare evaluations and rewards of others doing similar work (Adams 1965). In their study, results show that people employed in higher levels have a higher probability to get higher evaluations and therefore receive more rewards than workers

employed in lower levels, thus affecting beliefs of fairness of employees, which in turn will affect performance. Even though pay for performance doesn't seem to always have positive impacts on performance and motivation, these measures are not likely to be replaced, mainly for two reasons. First, they help to increase employer control over employees and create accountability for the public sector, which is often accused of incompetence and inefficiency (Kellough and Selden 1997). Second, the New Public Management approach reinforces the idea that because those measures are effective in the private sector, they will also be effective in the public sector, which is not always true.

The differences between the public and the private sector, the different characteristics of public employees and the previous experiences with the implementation of reward systems should be taken into account in the design of effective incentive schemes. When dealing with motivational and performance issues the possibilities offered by job design and job crafting, as proposed by the JCM, represent a valid alternative in the public sector, which often deals with budget constraints, and is less able to motivate, incentivize or create a worker friendly environment with the use of money. Programs and practices that enhance worker's experience in the workplace and better match with their preferences have proven to lead to positive job outcomes. Therefore, they identify as an alternative that matches organizations' need for high performance with employees' need for a better work environment. Moreover, HRM practices allow to better answer not only to employees' demands for flexibility, but also to external flexibility demands (such as those coming from citizens who need access public offices at different times or need access to services even during peaks in workload). The prosocial attitude of public employees should allow them to answer more strongly to practices which support their service to citizens (Garcıa-Chas et al. 2016), which in turn should affect their attitude towards their job, with positive outcomes for the organization. Thus, the introduction of programs and practices aimed at increasing flexibility in the workplace would prevent organizations from resorting to contractual adjustments, while adapting to both employees' and citizens' requests. The design of such programs however, is not straightforward and presents particular challenges as we will see in Chapter 3, in which we discuss the effects of flexitime in the public administration.

# Appendices

## 1.A Methodological Aspects

This thesis explores two distinct aspects regarding flexibility with different methods: the Chapter 2 tries to answer the research question using fsQCA, Chapter 3 uses a matching technique. While in the first case the study is heavily based on qualitative data, in the second case the data is purely quantitative. The choice between qualitative and quantitative methods is often addressed as a verbal vs. numerical issue, however, this distinction is too simple, and might lead to the thought that qualitative methods are less reliable compared to quantitative methods. M. A. Starr (2014) pointed out that the main difference between the two approaches lies in the open-ended character of qualitative data. When dealing with quantitative data researchers make questions and gather information using predetermined knowledge on the variables and instruments they use; data are precise, and it is not possible to understand the reasoning that lead to that particular data or result. Qualitative data instead, assume that the phenomenon being studied is complex in a way that a meaningful insight can only be obtained through the use of a more flexible tool. In this case the information gathered is usually richer, thus making qualitative methods more appropriate when in-depth analysis and background details are necessary for the understanding of the subject matter. The main issue is to determine which of the two approaches is better able to answer the research question that is being addressed, because the research method used must be coherent to the problem. The issue of numerical flexibility addressed in chapter 2, is faced as the exploration of a phenomenon, where the main focus is to understand why employers may choose a standard contract over an atypical contract, and to build configurations that connect different experiences and give meaning to what we observe in the choices of firms. In this context it seemed important to grasp as much detail as possible from the firms selected for the study, as

there exists a great variety in specific characteristics of jobs, and reasons that drive choices can be complex and difficult to summarize in a standardized form. Therefore, the method chose was one that allowed to include the variety of cases and to learn from the information gathered before moving to the analysis. FsQCA is a method that suited well with the purpose of this study because it is able to bring the logic of a case-oriented investigation to a larger $N$ (Ragin 2009). Instead of focusing on independent variables that each bring a contribution to the final outcome, fsQCA focuses on exploring the connections among relevant factors and the outcome in order to find common causal conditions that generate the presence or the absence of a result. Moreover, the choice of fsQCA over standard QCA is given by the fact that fsQCA allows factors to take multiple values instead of only two, which was useful in dealing with the variety of job characteristics. Temporal flexibility instead, is approached in a different way in Chapter 3. The main goal of the study is to capture the net effects of a flexitime program on absenteeism, hours worked and overtime. In this case after an initial analysis of the problem and of the variables at stake it is possible to formulate a hypothesis to test through a matching technique. The exercise is numerical and aims at determining whether the program leads to some clear differences in terms of hours. In this second study data come from a non-experimental setting, so it was necessary to find a method that allowed to compare and analyze data from a large quantity of people. Moreover, it was not possible to integrate the data gathering specific background information or understand the reasons that lead each person to the choice of entering or not the flexitime program. A matching method seemed the appropriate tool as it allows to use background information (covariates) to balance the distributions between treatment and control groups and create a setting that resembles a randomized experiment. In this way it is then possible to draw some conclusions on the behavior of the two groups.

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# Chapter 2

# Trading Off Flexibility: Contingent Workers or Human Resource Practices? A Configurational Approach

## 2.1 Introduction

Atypical workers usually earn low wages, incur lower hiring and firing costs for companies and have poorer career prospects than permanent workers (Barbieri and Cutuli 2016; Kalleberg 2003). While helping firms respond to market volatility, nonstandard workers impair productivity, quality standards and innovation capabilities and do not help firms compete in the higher quality market segments (De Stefano et al. 2019; Guillaume et al. 2019). Nevertheless, most firms adjust to volatile demand and variable market conditions by hiring nonstandard workers (Storey et al. 2002). This is believed to be particularly true for low-skilled jobs and tasks that do not require firm-specific knowledge (Håkansson and Isidorsson 2012). The link between atypical contracts and a low added value of jobs is consistent with the principles of core-periphery theory (Atkinson 1984), which distinguishes between simple, non–firm-specific tasks that are easily done by nonstandard and temporary workers and highly specific, complex tasks that only permanent workers can accomplish.

Consistently hiring a number of temporary workers is not, however, the only way to adjust to market demands and competition pressure (M. M. Allen et al. 2017; Sacchetti and Borzaga 2020). Several studies have examined the relationship between specific dimensions of work organisation, human resource management (HRM) and the use of temporary workers. By employing temporal flexibility (Doellgast and P. Berg 2018; A. J. Wood 2016), job rotation and training (Cappelli and Neumark 2004), job design (Cappelli and Keller 2013) and investment in firm-specific skills (Shire et al. 2009), firms can address flexibility needs without relying on temporary workers, with a positive impact on quality and productivity.

While previous studies have offered useful insights into atypical work, they have left two research gaps. The first regards whether firms confronted with volatile markets should limit permanent work to complex and specific tasks and maintain flexibility by resorting to atypical workers for simple tasks as argued by core-periphery theory (Martin and Scarpetta 2012).

The second research gap regards the use of HRM practices to moderate the use of atypical workers. Usually, individual HRM practices have been considered. By contrast, we suggest that employers' reliance on atypical workers does not result from a single management practice but rather depends on a bundle of practices and conditions. This view is founded on organisational theory, which describes how several factors affect organizational practices (Ouyang et al. 2016). Several studies have highlighted the role of organisational complementarities in shaping the advantages of management practices and technological choices (Brynjolfsson and Milgrom 2013; Milgrom and Roberts 1990; Misangyi et al. 2017). Business performance is not a matter of a single or a few management tools but involves several concurrent management practices.

Proceeding from these theoretical principles, we rely on a fuzzy-set qualitative comparative analysis (fsQCA) to analyse companies' use of atypical workers. Our first research goal, therefore, was to find typical configurations that lead to an extensive use of permanent work. FsQCA, with its underlying configurational perspective (Ragin 2008), provides a sound methodological basis for identifying configurations of factors that reduce the use of atypical workers. Moreover, fsQCA is consistent with the principle of equifinality. Using this approach, we can assess various combinations of causal conditions capable of generating the same outcome (Misangyi et al. 2017).

Our focus is on the service sector, in which the use of temporary workers is widespread.

Examples of service firms include restaurants, hotels and retail enterprises (Knox and Walsh 2005; Townsend et al. 2013; Whitehouse et al. 1997). By definition, part of the service must be rendered in the presence of clients (front office), and must adapt to irregular flows of clients (Künn-Nelen et al. 2013). This component of service cannot be buffered by inventories. Firms must also respond to demand that is characterised by both regular variations (at particular times of the day or particular days or seasons) and irregular variations (e.g., clients' arrival for a special event) (J. Burgess et al. 2013). In this context, businesses want to maintain a high reversibility of resources and avoid freezing operational capacity; consequently, they are under strong pressure to employ contingent workers.

Our results show that three configurations lead employers to hire permanent workers under unstable market conditions. Within such configurations, the HRM dimension plays a pivotal role in boosting the hiring of permanent workers, but it requires the concomitant and interconnected presence and/or absence of various organisational factors. The firm specificity of tasks turns out to be relevant, but it needs to be integrated with HRM practices to encourage the hiring of permanent workers. With regard to core-periphery theory, we show that, even in the case of simple and nonspecific work activities, appropriate HRM practices lead managers to hire workers permanently.

This chapter proceeds as follows. The next section describes the predictors of the hiring of nonstandard workers, and the third section presents the data, methods and procedures of analysis. The fourth section illustrates the results, while the fifth discusses our contributions to theory and highlights the managerial implications.

## 2.2 Theoretical Background

Demand volatility, which makes accurate predictions difficult, encourages firms to make extensive use of short-term employment arrangements (J. Burgess et al. 2013). In general, firms face specific market challenges shaped by the combined action of two market characteristics: variability and unpredictability (Ghosh et al. 2009). Variability describes uneven demand that can, however, be anticipated on the grounds of experience and stochastic calculations. Conversely, unpredictability means that consumer choices within specific markets cannot be foreseen, producing further uncertainty (Drago 1998). Several managers and companies have characterised their reliance on contingent workers as being necessary to survive

in fluctuating markets (Kalleberg and Marsden 2005). Essentially, they argue that they cannot hire people permanently unless demand is stable.

Various theoretical strands have highlighted several factors that limit the use of nonstandard workers when addressing flexibility needs resulting from market pressures. On one side, structural perspectives have paid attention to the nature of tasks, with core-periphery theory considering the complexity of tasks. A second determinant of the preference for permanent employment is firm task specificity and the associated costs sunk in training. On the other side, several studies highlight how HRM practices can moderate reliance on the labour market to attain flexibility. HRM practices aim to cope with market volatility through the internal adaptation of labour resources. Building on these strands of literature, which are presented in detail in the following sub-sections, we propose to extend the strategic view of flexibility by means of HRM practices, hypothesising that bundles of complementary practices can better describe configurations resulting in a high incidence of permanent workers.

### 2.2.1 The structural view and the nature of tasks

From a structural perspective, the use of nonstandard workers is positively correlated with the nature of the tasks designed by employers. An initial study highlights the role of work simplicity and well-defined elementary tasks (Cappelli and Keller 2013). According to the core-periphery hypothesis, simpler and easily learned jobs that are not firm specific are carried out by short-term workers, while more complex, company-specific activities are assigned to permanent and better-trained employees (Atkinson 1984). Thus, to satisfy demand peaks, firms can assign simple jobs to unskilled, temporary workers, while cognitive and relational tasks that require problem-solving and creativity demand well-trained workers (Autor 2015; Autor and Dorn 2013).

The task content of jobs is affected by the type of occupation. For example, supermarket cashier tasks and hotel cleaning jobs can be easily learned by newly hired workers, as these tasks are not complex. Conversely, maintenance workers or sales office employees need cognitive and/or relational skills that make them not easily replaced by temporary workers. Based on these studies, it is hypothesised that temporary workers performing simple jobs can easily be hired and fired to accommodate market fluctuations. By contrast, the most complex jobs require highly skilled workers who must be hired and retained through permanent contracts,

limiting employers' opportunities to rely on contingent work arrangements.

A partially different view derives from human capital theory and highlights the role of the firm specificity of tasks. When human capital is highly firm specific, the tasks require tacit skills and knowledge that workers must acquire in the workplace over time through training and experience (G. S. Becker 1964). Thus, the greater the specificity of tasks in a firm, the greater the sunk investment in human resources and the greater the irreversibility of hiring choices. After spending time and resources in training workers, entrepreneurs are willing to retain the workers to recoup their investments (Cappelli 1998). Firm specificity adds one more dimension to the complexity of tasks considered by the core-periphery model. This is particularly true in the context of customer services, in which firms can make a strategic choice about the type of service they wish to provide (Shire et al. 2009). A hotel can adopt cost-cutting policies by using nonstandard contracts for check-in and check-out operations, but this is hardly a solution if the competitive strategy is to offer tailored relational services that demand knowledge of client preferences. Companies can strategically decide whether they aim to serve a general customer or to cultivate a particular organisational culture by offering tailored services to well-defined categories of customers (Batt et al. 2009). Companies that pursue firm-specific approaches to customers are inclined to develop long-term relationships with their employees and hire them permanently (Shire et al. 2009).

We suggest that the firm specificity of tasks (Shire et al. 2009) can affect the use of atypical contracts in interaction with the tasks' simplicity/complexity (Autor 2015) and vice versa. At one end are simple tasks that are not firm specific and can be performed by unskilled workers, favouring atypical work. In the middle are tasks that require cognitive and relational skills that are not firm specific as well as easy tasks that require firm-specific skills. In this case, companies will be more inclined to hire workers permanently. At the other end are complex tasks that require firm-specific skills. Simultaneously, market variability and unpredictability can drive companies to rely on contingent employment contracts for simple and not organisation-specific tasks.

### 2.2.2 Towards a strategic view: HRM practices as moderator

The literature on the service sector highlights how several HRM practices enable firms to respond to market pressures without relying on contingent employment contracts (Boxall and

Macky 2009). HRM flexibility practices help workers adapt in terms of tasks and working time, thus reducing firms' need to employ temporary workers to meet variable market demand (Knox and Walsh 2005). Through job rotation, managers encourage workers to learn to perform diverse tasks, thus allowing them to adapt their workforce to volatile demand or to the need to replace absent workers, reducing reliance on temporary contracts (Cappelli and Neumark 2004; MacDuffie 1995). Implementing job rotation systems requires proper training to equip workers with the necessary knowledge (Bonavia and Marin-Garcia 2011). These findings are relevant for temporary workers' employment, as companies that invest in worker training have a strong incentive to hire them permanently(Davis-Blake and Uzzi 1993). HRM practices related to flexible working schedules, such as overtime and part-time work, are increasingly adopted by companies and can also limit a firm's reliance on nonstandard contracts (Lambert 2008). Regarding part-time contracts specifically, overlapping shifts of part-time workers can be employed in businesses such as retail shops and supermarkets to meet market demand that cannot be satisfied with buffers (Künn-Nelen et al. 2013). Therefore, firms can respond to variability in markets by increasing the temporal flexibility of regular workers.

### 2.2.3 Interconnecting diverse theoretical strands

Previous research has focused primarily on how individual or only a few market, structural and HRM factors and underlying theoretical principles are related to the use of atypical workers (Batt et al. 2009; Cappelli 1998; Cappelli and Neumark 2004; Martin and Scarpetta 2012; Shire et al. 2009). These theoretical reflections and empirical outcomes have offered useful insights into how and why employers resort to atypical contracts. However, as an alternative to market exchange, we argue for the importance of advancing our understanding of the strategic nature of policies aimed at increasing flexibility through HRM practices. To this end, we follow the organisational complementarities theory (Brynjolfsson and Milgrom 2013; Misangyi et al. 2017) and the coherent principles of set-theoretical, configurational thinking (De Vos and Cambré 2017; Farivar and Richardson 2020). Because organisations can be best understood as interconnected practices, we suggest that the market, the nature of tasks and HRM practices be analysed in their mutual relations within a set-theoretical approach to clarify their overall influence on the use of nonstandard workers. For instance,

job rotation strengthens firms' flexibility in simpler jobs (MacDuffie 1995; Pulignano and Signoretti 2016). Nevertheless, workers performing complex jobs gain learning opportunities by concentrating on the same activities, so, in such circumstances, job rotation would limit rather than increase employee knowledge and skills (Hsieh and Chao 2004), hence possibly hindering and not encouraging employers' reliance on permanent positions. Additionally, HRM practices and job complexity should be viewed in their mutual relations with market characteristics and the firm specificity of tasks (Shire et al. 2009). Therefore, we argue that it is necessary to combine these various theoretical strands, which embrace market-based approaches, organisational job design, human capital theory and HRM flexibility, to better understand firms' reliance on atypical contracts.

To gain an overall view of the strategic interplay of the market, the structure of tasks and bundles of HRM practices, we adopted a configurational approach. Through this methodological choice, which is described in Section 3, we pursue a twofold goal. First, we investigate whether and what combinations of factors encourage employers to hire workers permanently, acknowledging the importance of considering several elements at once to understand the organisational phenomena related to the use of atypical workers. Second, by drawing on the configurational results, we confirm whether firms, even in the case of simple and non–firm-specific jobs, are not inevitably bound to hire nonstandard workers to adjust to volatile markets.

## 2.3 Methods

### 2.3.1 Data and Procedure

The data were collected in 2018–2019 and consisted of 39 interviews from 17 different service sector firms located in north-eastern Italy. We identified 34 occupations, such as waiter, security guard, and shop assistant, for which proper information was collected on all our variables of interest. All the jobs considered are operative, meaning that we did not consider coordination or management jobs. North-eastern Italy was selected because of its economic vitality, which possibly captures sophisticated HRM and organisational courses of action. We involved firms of different size. We relied on an intermediate N-sample (i.e., between 10 and 40 cases) to deal with our five predictors derived from our theoretical background: job rotation, firm-specificity of tasks, simplicity/complexity of the job, working time flexibility

and market volatility (Kosmol et al. 2018). Jobs vary in terms of complexity as, for example, a maintenance worker fixing complex machinery performs more specialised work activities than an employee who hangs blankets up to dry. We tried to consult firms that presented differences among the factors of interest to address possible issues linked to limited diversity (Su et al. 2019).

Before interviewing the managers, background information about the company was collected. We interviewed owner–managers, members of the executive boards, and heads of HRM and/or commercial operations departments. Managers were chosen based on their knowledge of the themes under scrutiny. We interviewed more than one manager within larger enterprises to triangulate information and reinforce the robustness of the available data (Yin, 2014). In small companies, it was sufficient to consult with the owner-managers. Table 2.1 presents the type of people interviewed, and basic information about the firms. Enterprises are only numbered to ensure the anonymity of the participants. We conducted all interviews face-to-face and, in some cases, asked for further information by phone and/or e-mail (Geary et al. 2017)[1]. Interviews were recorded and transcribed.

We relied on semi-structured interviews (see Section 2.A) because they ensured a certain degree of consistency while also ensuring that the interviewees expressed the mechanisms underlying their choices and the interconnections among the variables of interest. To facilitate an open expression of the manager's ideas and facts, we guaranteed anonymity to all interviewees (Bader et al. 2019). Interviews were centred on the content of the independent and dependent variables, which constituted the data of this study and were also explored through indirect questions. In particular, they focused on the firm's HRM practices, on the structure of tasks inside the firm and the characteristics of different jobs, whether atypical work is used to face market pressures and professional development opportunities for atypical workers.

### 2.3.2 Configurational Perspective

We consider all predictors simultaneously in relation to the employment of non-standard workers by following the set-theoretic approach of fsQCA (Ragin 2008). Configurational

[1]In the few cases where task description by different interviewers did not agree, additional information or a second round of interviews were used to reach a unique codification of the task.

| Company | Business | Province | Number of employees | Manager interviewed |
|---|---|---|---|---|
| 01 | Clothing shops | Venice (Italy) | 6.320 | HRM Director, Administrative HRM Manager, Commercial Director |
| 02 | Supermarket chain | Venice | 7.219 | HRM Director, Administrative HRM Manager, Commercial Director Supermarkets, Commercial Director Superstores |
| 03 | Supermarket chain | Verona | 20.921 | HRM Director, HRM Manager Northern Italy, Commercial Director |
| 04 | Electronic shops | Brescia | 150 | Commercial Director, Commercial Manager Northern Italy |
| 05 | Hospitality | Verona | 41 | Owner–manager, Finance Director, Operations Manager |
| 06 | Hospitality | Treviso | 15 | Owner–manager in charge of HRM, Owner–manager in charge of commercial activities, Finance Manager, |
| 07 | Entertainment | Verona | 752 | HRM Director |
| 08 | Hospitality and bar/food | Verona | n.d. | Owner–manager |
| 09 | Restaurant | Verona | 6 | Owner–manager |
| 10 | Restaurant | Verona | 15 | Owner–manager |
| 11 | Restaurant | Verona | 10 | Owner–manager |
| 12 | Pizzeria and restaurant | Verona | 22 | Owner–manager |
| 13 | Security | Bergamo | 1.205 | HRM Director, Industrial Relations Manager, Administrative HRM Manager, Industrial Relations Employee, Commercial Director |
| 14 | ICT and marketing | Verona | 71 | CEO, HR Director, Creative Office Manager |
| 15 | Laundry | Parma | 1.851 | HRM Manager (Laundry Business), HRM Manager (Sanitation Business), Plant Manager |
| 16 | Warehouse | Verona | 464 | Owner–manager in charge of commercial activities, Owner–manager in charge of operations, Shift Manager |
| 17 | Commercial and catering | Venice | 1500 (Italy) | HRM Director |

Table 2.1: Information on Case Study Firms and Managers Interviewed

comparative methods represent a valid approach in studies with small samples (Fiss 2007). In particular, fsQCA enables identifying common causal conditions that generate a certain result when complex inter-relations among variables are present. FsQCA is based on fuzzy logic, which, unlike binary logic, allows variables to be any real number between 0 and 1. By assigning these membership values to variables for each case, fsQCA then identifies specific combinations of variables that lead to the outcome using Boolean algebra: cases sharing specific combinations of variables and exhibiting the same outcome signal causal-relevant conditions. Related configurational thinking has attracted growing attention in the HRM literature (De Vos and Cambré 2017; Farivar and Richardson 2020). The configurational approach is based on three forms of causal complexity that are particularly relevant for our purposes: conjunctural causation, equifinality, and asymmetry (Misangyi et al. 2017; Schneider and Wagemann 2012). Conjunctural causation is viewed as a 'causal recipe', in which sets of factors interact to generate the outcome. Equifinality means that different causal recipes can be functionally equivalent; thus, non-competing paths can yield the same outcomes (Goyer et al. 2016). Asymmetry means that one factor can influence the outcome within one configuration and be absent within others, depending on its combination with other factors (Ragin 2008). From a practical point of view, this implies several steps, the first of which calibrate the variables by creating a table that maps each variable's characteristics through graded membership within a scale of 0 (full non-membership) and 1 (full membership). The second step assigns each case fuzzy set membership value for each variable and checks the relationships among variables and the outcome. This step allows identifying possible conditions, and, in some cases, reducing the number of characteristics to be considered in the analysis. The third step is to create the truth table for fuzzy data, which identifies sufficient relationships among variables and the outcome, clarifying the combinations of variables that lead to the outcome. Based on the number of cases, consistency, and knowledge of the matter, relevant combinations are selected to continue the analysis and obtain the final configurations.

### 2.3.3 Measures

We converted the data into a four-value fuzzy set with 1 = fully in, 0.67 = more in than out, 0.33 = more out than in, and 0 = fully out. The four-value fuzzy set was especially

useful in our study because managers who were interviewed were not always able to provide detailed answers on all the subjects explored, and interpretation of HRM practices differed between businesses (Ragin 2008).

In the fsQCA coding process (calibration), cases were assigned membership scores based on the four values previously highlighted. As our study was based on qualitative data, calibration of independent variables was based on researchers' judgement, while the dependent variable was calibrated according to predefined thresholds (Kosmol et al. 2018). The calibration is reported in Table 2.2. Some clarifications are needed. Regarding the independent variables, we considered the predictability of fluctuations along with market variability. Variable markets with regular fluctuations present fewer managerial issues in limiting temporary work employment than variable markets with unpredictable fluctuations. Second, the column related to job rotation should be read by considering the peculiarity of workplaces. A waiter who regularly handles clients works in the kitchen and serves tables performs a complete job rotation. Third, the time required to learn a job was an important criterion in defining the specificity of a job. We considered the deployment of atypical workers as dependent variables. We referred to contingent employees as those hired by all contracts other than permanent contracts. Regarding the calibration of the dependent variable, we referred to commonly used thresholds of atypical workers to grade membership (European Commission 2018; Pulignano and Doerflinger 2013; A. J. Wood 2016). Moreover, if the interviewed reported that non-standard contracts were considered an entry point for permanent employment[2] (Mitlacher 2007), we systematically asked how many temporary workers have ensured a regular contract out of the total of contingent employment contract used[3].

All three researchers were involved in coding activity, given the importance of relying on more than two coders whenever possible to strengthen data reliability (Krippendorff 2004). The calibration frame was discussed and elaborated on before and after reading a couple of cases together (i.e., all three researchers). We then tested the coding frame's applicability using the intraclass correlation coefficient ($ICC$) parameter, which is suitable when there are more than two coders and when a subset of cases is rated by multiple coders and the

[2]We considered permanent employment only open-ended contracts, both full-time and part-time. All other forms of temporary employment are referred to as contingent employment

[3]We do not report this criterion in Table 2.2 as it did not change what is determined by the proportion of nonstandard employees deployed.

| | Job rotation | Firm-specificity of tasks (time required to learn the job inside the firm) | Simplicity/complexity of jobs | Working time flexibility | Market stability and predictability | Deployment of atypical workers |
|---|---|---|---|---|---|---|
| 0.0<br>Fully out | No job rotation or sporadic (e.g., in case of operations emergencies) | None (1–7 days) | Repetitive and non-cognitive tasks | No part-time and overtime or limited use of one of these tools | Completely or very variable and unpredictable | 40% |
| 0.33<br>More out than in | Occasional rotation on some work activities | Few specificities (2–4 weeks)/ Not very specific (1–3 months) | Mainly or quite repetitive tasks entailing some cognitive skills | Limited use of both part-time and overtime | Variable but with the possibility of foreseeing fluctuations in which the amount remains unpredictable | 21–39% |
| 0.67<br>More in than out | Quite periodic or periodic rotation on some or several work activities | Good (4–9 months) or high specificity (9 months–1 year) | Mainly irregular and non-repetitive tasks entailing cognitive tasks | Frequent reliance on either part-time or overtime | Variable but with quite or very foreseeable fluctuations | 11–20% |
| 1.0<br>Fully in | Periodic rotation on many or all work activities | Very high specificity (more than 1 year) | Irregular and non-repetitive tasks requiring high cognitive skills | High use of both part-time and overtime | Stable and predictable | 5–10% |
| Example quotation | 'Organisation here works like this: if I'm a warehouse worker and I'm done with my activity, I can go help customers or fold clothes.' 01 | 'It generally takes two months to be independent; for a fast learner, it can be half of that time.' 09 | 'There are written protocols and procedures which need to be followed. Workers always have them available in front of them, and that helps.' 15 | 'Overtime is widely used here; together with the management of shifts, it guarantees the presence of employees when it's most needed.' 13 | 'On average, we have few customers from Monday to Thursday. On Friday, customers start growing, and almost 50% of our revenues come from the weekend.' 02 | 'We always offer a fixed-term contract up to 36 months to new employees, which also serves a trial period. They are around 15–20% of total employees.' 04 |

Table 2.2: Fuzzy Set Scores for Independent and Dependent Variables

rest by one coder (Hallgren 2012). We achieved good intercoder reliability ($ICC = 0.78$) (Cicchetti 1994) in eight cases and 19 interviews and assigned the remaining ones equally to single researchers. Exemplary quotations of our calibration are presented in Table 2.2.

## 2.4 Results

As fsQCA focuses on sufficient conditions, following (Ragin et al. 2017), we first tested the necessary conditions. In fsQCA, necessary conditions are able to singlehandedly produce the outcome, and therefore constitute a superset of the outcome. As such, they must be tested before continuing with the analysis. We tested each variable individually for its presence or absence. The consistency must generally be higher than 0.9 to consider the condition necessary for the outcome (Schneider and Wagemann 2012). As scores for our conditions all remained below 0.9 for both the presence and absence of single variables, we concluded that there were no necessary conditions. We proceeded to identify sufficient conditions, which instead constitute a subset of the outcome. This enabled equifinality, meaning that the same outcome can be achieved through different combinations of factors.

The analysis of sufficient conditions measures the extent to which the reduced deployment of atypical contracts is causally related to the external and internal factors previously described. To assess the sufficiency of causal combinations, we used the fsQCA truth table algorithm. The sufficiency condition was also supported in the analysis because, in further steps, no condition alone was able to predict the outcome.

We created the truth table for fuzzy sets by following a two-step procedure. In the first step, we created the truth table from fuzzy data. We specified the outcome (i.e. our dependent variable of deployment of atypical workers) and determined the conditions to include in the analysis. In the second step, we selected relevant cases based on the frequency and consistency of the subsets. Given the small dataset, the recommended frequency threshold based on the number of cases was equal to two (Ragin et al. 2017). For consistency, we selected a threshold of 0.8. We then applied the standard analysis and reduced the truth table analysis rows into more simplified combinations using the intermediate solution. The results in Table 2.3 show the three configurations that led to a reduced deployment of atypical workers. The resulting three paths, summarised in Table 2.3, are different in terms of present or absent conditions but equally, lead to atypical workers' low deployment. We

| Configuration | Task-driven configuration | HRM configuration | Firm-driven configuration |
|---|---|---|---|
| Causal condition | | | |
| Intra-organisation factors | | | |
| Job rotation | ○ | ● | ● |
| Specificity | ● | ○ | ● |
| Simplicity/Complexity | ● | ○ | |
| Temporal Flexibility | ○ | | ● |
| External factors | | | |
| Market | ● | ● | ● |
| Consistency | 0.880723 | 0.897409 | 0.864198 |
| Raw Coverage | 0.337022 | 0.399262 | 0.290456 |
| Unique Coverage | 0.093592 | 0.171047 | 0.107884 |
| Empirical Cases | 4, 21, 24 | 1, 5, 12, 13, 14, 23, 27, 31 | 2, 6, 8, 11, 25 |
| Overall Solution Consistency: 0.932561 | | | |
| Overall Solution Coverage: 0.631166 | | | |

● Presence of a condition, ○ Absence of a condition

Table 2.3: Analysis of Sufficient Conditions

dubbed them: task, HRM, and firm-driven configurations.

In the task-driven configuration, workers are at the deli counter of a supermarket, cooks in restaurant #12 (see Table 2.1), and waiters in restaurant #11. All these workers share jobs that require a great amount of time to be performed autonomously; however, they focus on their tasks without covering different positions inside their firm. In particular, they develop relevant skills to run highly firm-specific tasks and are difficult to replace. Regarding cooks, the restaurant owner stressed that there is no possibility of adding to these workers' activities because they need to focus on their tasks. Describing the kind of requirements needed to perform the job, he stated:

> To become a pizza chef requires one year or so because you need to understand how to make dough. Because I also want my dough, that is it. What we do in our pizzeria was done by the former owner for ten years, and by the former owner again for eight and nine years. Thus, it is 40 and 35 years that a specific dough

> is prepared. I want that. [...] Because if a person has been coming here for ten years to eat pizza and I change the dough he/she does not come anymore. We have experienced this various times.

People working in these jobs are found in organisations that rarely use temporal flexibility. This absence represents a co-predictor for the low deployment of atypical workers within the 'task-driven' configuration. Drawing from within-case knowledge, it emerges that the difficulty and firm-specific character of jobs requires hiring full-time employees, while the low reliance on overtime seems related to the proper internal organisation of shifts.

The 'HRM configuration' is the most frequent solution (coverage 0.399 and unique coverage 0.17). This configuration identifies different jobs characterised by high job rotation and associated (mainly on-the-job) training and the simplicity and non-firm-specificity of the jobs. Concurrently, employees follow standard procedures when performing their jobs, while temporal flexibility decisions are not relevant in this configuration. In these cases, employers prefer to have regular workers to offer good and reliable services, despite the simplicity of and low firm-specificity of the tasks. This category included all three jobs conducted in a warehouse company. The employees were involved in different steps of warehouse operations, with different levels of difficulty, but managers stressed that people could be assigned to different jobs, both because the jobs themselves are easy to learn and because people often rotate for emergency reasons and can learn different activities:

> Yes, we have a good number of people who can perform different jobs. Including us, of course, I worked in different areas of the warehouse myself, so I know how things get done. We expressly trained a lot of people for this need... We have this possibility... and it helps a lot. When we have an emergency, we know we can take resources and place them in other units – perhaps not all of them, but a great number. Some people can perform two activities, and some can perform all of them.

In the same configuration, there are employees of an industrial laundry, performing different tasks including monitoring washing machines and spreading the sheets after they were washed:

> The strategic aspect here is not in the individual worker as the professional

> content of the job is not high: it's essentially loading and unloading the machines and monitoring that they work properly... training on the machines does not require more than a week, it's extremely easy from this point of view. People are trained by someone doing the same job. How long does the training last? Three days may be less for unloading sheets.

In addition to these jobs, which can be considered non-specialised, we find employees in the reception at a small family hotel #5 and waiters in restaurants #6 and #12. From interviews with the operations manager of the hotel, we learned that the possibility of having people who can cover different positions when the firm is in need, even if the job is not difficult, seems to encourage employers to rely on the same people instead of searching for temporary workers. In this particular case, receptionists also helped with bar and room service (e.g., making the beds) when needed. Therefore, such employees are more easily hired with standard contracts than with atypical arrangements.

In the firm-driven configuration, all predictors are present, except job complexity, which does not seem relevant. Jobs in this configuration are highly firm-specific, include periodic rotation on many activities, and are subject to high use of part-time or overtime work. The latter represents the main form of temporal flexibility within the most specialised working activities. Within this configuration, jobs included maintenance workers in an industrial laundry company and an amusement park. Employees with visual merchandising duties in shops that were part of a large clothing company, stock clerks in a supermarket, and cooks in restaurant #10. In the first case (maintenance workers in an industrial laundry company), the firm's operations are generally stable over the year, in the second case (maintenance workers in an amusement park), the amusement park is seasonal and closed in the winter. Maintenance workers were very busy when the park was closed and only performed emergency adjustments when the park was open. The importance of these workers to the park is mostly highlighted by the fact that in the high season, only one-sixth of the company's employees are hired with a standard contract, and almost all are maintenance workers. Further, stock clerks in a large supermarket were included in this configuration. However, interviews with directors highlighted how these particular workers undergo long training and perform many different tasks. Supermarket management chose to have only two distinct operative jobs inside the supermarket: butchers assisting customers at the deli counter and workers covering all other

duties. This choice allows the second category of employees to rotate very often and be ready to cover positions whenever needed; this is why we find them in this configuration.

Regarding this category of workers, the company uses several part-time contracts to make employment compatible with market demand and, thus, with consumers' flow. Concurrently, overtime is requested for part-time workers to adjust to small additional fluctuations. Finally, the presence of cooks in this configuration indicates a business that, in contrast with those belonging to the task-driven configuration, trains its employees to cover different activities and makes use of temporal flexibility in terms of overtime, because of the internal organisation and the specific flow of clients. Workers who have firm-specific skills and the ability to perform many different tasks but are also temporally available to perform their job causes employers to reduce atypical contracts.

## 2.5 Discussion

This study first aimed to examine the combinations of factors that encourage employers to hire workers permanently. Contrary to previous studies that focused on a single or a couple of factors, we followed the idea that multiple factors influence organisational practices at once (Ouyang et al. 2016). Our configuration analysis provides insights into the combinations of several factors and underlying theoretical strands that cause employers to reconsider hiring through temporary contracts and select permanent contracts instead. This configurational view goes beyond simpler combinations of factors highlighted by other mentioned research. In our analysis, the factor that identifies the external conditions of the market is always present. This results from the fact that all firms interviewed, except one, faced similar market conditions: variable but predictable demand. However, we were able to notice how firms reacted in a different way to the same external environment. It was also confirmed that firms manage different workers differently (J. A. Schmidt et al. 2018).

Our results show that the HRM dimension and related practices play a strategic and pivotal role in permanent employment, importantly mediating market pressures (Boxall and Macky 2009). They are relevant both within the HRM and firm-driven configurations when present and within the task-driven configuration when absent. However, this influence requires the concomitant and interconnected action of other factors. Job rotation leads to the hiring of permanent workers when jobs are simple and non-firm-specific. Therefore, HRM practices

help workers in the lower ranks acquire valuable skills. Temporal flexibility makes workers more relevant for companies when integrated by other HRM practices and job characteristics in terms of structure of tasks (Pulignano and Signoretti 2016), assuring qualified flexibility in terms of the variety of jobs performed (job rotation) and peculiar knowledge of company processes and customers (firm-specificity). Thus, workers' flexible presence configures itself as crucial (A. J. Wood 2016) only when in co-occurrence with more than one other factor. In contrast, in the case of firm-specific and complex jobs, the HRM practices of job rotation and temporal flexibility limit learning and knowledge acquisition in more complex working activities (Hsieh and Chao 2004). Part-time work operates in the same direction. Thus, in specific situations, some HRM flexibility practices, such as job rotation and part-time, can configure themselves as 'double-edged swords'.

Our results are also relevant in the light of human capital theory. We observed broader linkages between firm-specificity of working activities and permanent contracts than those hypothesised by human capital theory. The investments in training for firm-specific working activities and the related difficulties of finding adequate people in the labour market is insufficient to encourage firms to hire permanent employees. Firm-specific human capital alone is not sufficiently valuable for companies. It should be accompanied by the complexity of jobs, or HRM practices, to obtain further and qualified flexibility. Thus, further joint investments in human resources are required beyond firm specificity.

Our second research question involved investigating how to trade off the costs of flexibility and long-term competitiveness, at the lower ranks, to meet market fluctuations. Our configurational results contradict the core–periphery model and similar analyses focusing on the sheer nature of tasks to forecast the deployment of atypical or permanent workers. In fact, the strategic use of proper HRM practices, particularly job rotation, lead to higher skills in workers and flexibility that encourages managers to permanently hire them, even in non-specific and simple work activities. Employers appreciate the flexibility and constant quality of these workers. In this vein, HRM practices have become means of increasing the value of unskilled workers by upgrading the skills of this potentially marginalised workforce.

Concerning managerial implications, this study suggests that well-designed HRM and job design practices can modify the trade-off between the quantitative adaptation of the workforce and the preservation of human capital. Such practices can make it easier to keep

permanent workers and avoid the shrinking of human capital invested in the firm while coping with volatile demand. Moreover, it stresses the importance of considering a combination of job characteristics in choosing which contracts to adopt, specifically when trying to reduce the deployment of atypical contracts. It is not only the specificity of jobs or the number of tasks one is supposed to perform which should be considered when choosing an employee's contract, but also temporal flexibility demands. Second, the configurational approach allows managers or business owners who are in charge of similar jobs to understand which elements it would be useful to work on reducing the deployment of atypical contracts. The analysis has shown that structure of tasks and HRM practices, or their proper mix, might also help contain the use of atypical labour contracts when tasks are simple and non-firm-specific.

This study has some limitations. The first relates to the specific context in which data were collected. Different contexts with different labour laws and incentives might lead to different results (Liu 2015; Richbell et al. 2011). Therefore, further studies should focus on configurations in a modified framework to understand the actual importance of national labour laws. Concurrently, although set-theoric principles are useful in showing causal relations (Fiss 2007), we relied on cross-sectional data hence further longitudinal studies would be particularly valuable to inquire changes over time (Farivar and Richardson 2020). Second, while the low reliance on atypical contracts can positively contribute to service quality, employee stability, and career prospects, we also considered the utilisation of part-time contracts and overtime in our configurations. Research has shown that such contracts and extra time at work can have detrimental effects on employees' economic capacity and life organisation when their use and regulation are unilaterally determined (Doellgast and P. Berg 2018; Scholarios et al. 2017). Further, as mentioned above, the patterns of demand that we observed are similar: they are highly variable, but predictable. We do not have enough observations on highly unstable or non-predictable markets. Further studies might include firms with higher variability in terms of market conditions, which might bring out configurations that could not be detected.

## 2.6 Conclusion

This study provides insights into firm strategies concerning the deployment of atypical workers in the service sector (Knox and Walsh 2005; Townsend et al. 2013). Hiring permanent

workers has positive influences for both workers' employment conditions and companies' productivity and innovation capabilities. First, by drawing on configurational theory (De Vos and Cambré 2017; Misangyi et al. 2017), our findings underline that there is no single condition, but a combination of different conditions lead to more stable jobs. Considering a single or a couple of factors can be misleading for understanding organisational practices that require weighing several relevant aspects (Farivar and Richardson 2020). Second, our results corroborate previous studies that argue that firms do not need to hire a consistent number of temporary workers to adjust to volatile markets (M. M. Allen et al. 2017). This is also true in the case of lower-ranked jobs. Even when tasks would suggest contingent contracts as a cheaper way to accommodate unstable demand, HRM practices can modify the trade-off in favour of stable arrangements.

# Appendices

## 2.A Semi-structured interview with Managers

We report the subjects and questions whose answers have been used for the manuscript.

**General characteristics of the company and related market** The interview starts with questions that aim to understand the structure of the firm in terms of plants/units and people employed, the products/services offered and the quality requested, and the variability and predictability of the market.

1. An illustration of the company's structure (sites, etc.) is asked, as well as of its products/services and related markets by paying particular attention to the variety and variability of consumer demand in temporal and quality terms.

2. Particularly, are there monthly, weekly, or daily peaks or strong reductions in consumers' demand?

3. Are you able to foresee these variations and to what extent?

4. What is the flow of the production process?

5. How many people are employed?

6. In the latest 5 years, did you undertake off-shoring operations and why?

**Work organization and human resource management** This section of the interviews aims to understand the organizational and human resource management systems used by firms.

7. In general, how are working activities organized in terms of rotation and autonomy? For instance, are workers able to perform different tasks and are they able to make autonomous decisions with respect to clients' complaints, requests, products' prices, etc.?

8. Is rotation among tasks structured?

9. Do people need specific technological, linguistic, and relational competences?

10. How long does it take for a person, on the average, to learn the different tasks they should perform with adequate productivity?

11. As regards working time, do you use part-time contracts? In which departments/offices are such contracts used?

12. Is overtime used? To what extent?

13. Do you arrange training activities and on what subjects?

14. Do you have contingent pay systems and/or monetary incentives for workers?

**Demand of atypical workers** This part of the interview is devoted to understanding in detail the use of atypical contracts in the latest years by also considering different types of atypical contracts, the reasons underlying their use, etc.

15. How many people hired with open-ended contracts have worked in the company in 2016 and in 2017?

16. How many people have been hired with atypical contracts in 2016 and in 2017? What is their proportion out of the total workforce?

17. Do you use these contracts especially within specific departments/offices/occupations?

18. What type of atypical contracts do you use?

19. In which departments/offices are these contracts concentrated?

20. How come you rely on these atypical contracts?

21. Is specific education and/or previous working experience required for workers hired with atypical contracts?

**Introduction of atypical workers in the organization** These questions are bound to inquire how atypical workers start working within the organization and their eventual defined path over time.

22. What are the responsibilities and the autonomy assigned to atypical workers?

23. How much training do atypical workers carry out? On which subjects?

24. Do you have specific paths of stabilization for atypical workers?

25. How many atypical workers have been promoted into permanent positions, in percentage terms out of the total atypical workers hired, in 2016 and in 2017?

## 2.B Fuzzy-set QCA

Qualitative Comparative Analysis (QCA) is a method based on set theory which enables to model equifinality, namely the principle by which multiple solutions or paths may lead to a certain solution (Fiss 2007). In contrast with traditional quantitative analysis techniques, QCA assumes causal complexity and concentrates on asymmetric relationships that create configurations that lead to a specific result. A configuration is a combination or variables or conditions which are minimally necessary and/or sufficient to cause a specific outcome.

In a set theoretic perspective, a condition can be necessary, if it needs to be present in order to see the outcome, or sufficient, if its presence alone enables to see the outcome. Necessity and sufficiency are often considered together as the combination of the two are significant. We say that a cause is necessary and sufficient if it is the only one that produces the outcome. We say that a cause is sufficient but not necessary if it is able to produce the outcome, but it is not the only one, and that a cause is necessary but not sufficient if it can produce the outcome together with other causes, and we find it in all the combinations.

Configurational comparative methods represent a valid approach in studies with small samples (Fiss 2007). In particular, QCA enables to identify common causal conditions that generate a certain result when complex sets of inter-relations among variables are present. Quantitative methods like regression are more appropriate to isolate independent net effects

of variables on a dependent variable (the outcome), while QCA identifies specific combinations of variables that lead to the outcome. Moreover, QCA identifies multiple valid paths to the outcome, and since non-valid paths can be much different from the valid ones and not just their opposite, this enables asymmetric causality.

The two alternatives in using QCA are determined by choosing a crisp set QCA or a fuzzy set QCA. The first employs dichotomous variables, meaning that a case can be either "fully in" or "fully out" of the set, much like binary variables. Fuzzy-set QCA (fsQCA) instead, is based on fuzzy theory (Zadeh 1996) which can be considered half-way between qualitative and quantitative methods, while transcending many of the limitations of both (Ragin 2008). In this case, variables are assigned different membership values between 0 and 1. The set can consist of three values $(0, 0.5, 1)$, four values $(0, 0.33, 0.66, 1)$, six values $(0, 0.2, 0.4, 0.6, 0.8, 1)$ or be continuous in the interval between 0 and 1. Therefore, the choice of using fsQCA instead of a traditional crisp set one, is more appropriate when variables considered are ordinal or continuous. With fuzzy sets a calibration process is required in order to assign values to each case. Calibration involves choosing known standards for variables which make them directly interpretable (Mello et al. 2019).

QCA consists in different steps. After calibration of variables and the scoring of each case, researchers must construct the truth table for fuzzy data. The truth table contains $2^k$ rows, where $k$ is the number of causal conditions in the analysis. Each row represents a different combination of specific scores, while columns represent conditions. Cases are assigned to the range of possible configurations according to their scores, which involves the possibility of not displaying cases in each possible configuration contained in the truth table and having more cases assigned to the same configuration. The next step is to reduce the number of rows in the truth table. Although there are different algorithms which are able to logically minimize a truth table, the one used by the `fsQCA 3.0` software we used for our analysis, employs the Quine-McCluskey algorithm which is based on Boolean algebra. The results given by this algorithm are a series of combinations of minimally sufficient causal conditions that lead to the outcome. Each solution is displayed with its coverage and consistency. Coverage indicates how much of the outcome $Y$ is covered by the solution $X$, analogous to

the $R^2$ in regression analysis, computed as follows:

$$C_{XY} = \frac{\sum \min(x_i, y_i)}{\sum y_i} \tag{2.1}$$

However, coverage doesn't necessarily coincide with theoretical significance. It is possible to have solutions with high coverage which are theoretically less interesting than one with lower coverage. Therefore, it is important not to focus on minimum coverage values and read results in light of the theoretical framework of the study instead (Schneider and Wagemann 2010).

Consistency defines the "degree to which the cases sharing a given causal factor or combinations of causal factors agree in displaying the outcome in question" (Leischnig et al. 2016) indicating the degree to which the solution is sufficient to produce the outcome and is analogous to a correlation coefficient:

$$I_{XY} = \frac{\sum \min(x_i, y_i)}{\sum x_i} \tag{2.2}$$

where $X$ is the predictor configuration, $Y$ is the outcome set, $x_i$ indicates the membership score of each case in a combination of conditions $X$ and $y_i$ indicates membership score of each case in the outcome set $Y$. For medium sized $N$ (between 30 and 60) consistency values in the solution should be higher than 0.7. It is however worth noticing that unlike statistical significance thresholds, consistency largely depends on the research design, meaning that quality of data, number and knowledge of cases, specificity of theories can influence the final consistency scores (Schneider and Wagemann 2010). Therefore, levels of consistency should be explained considering the research framework and design, rather than a conventionally accepted level of significance.

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# Chapter 3

# An Impact Analysis of A Flexible Work Time Plan in a Public Health Agency

## 3.1 Introduction

Flexible working time arrangements generally refer to programs, policies and practices implemented by employers which allow workers to gain a certain level of discretion over their working schedule (Golden 2012). These kinds of arrangements are usually conceived as HRM practices or work benefits aimed at improving employees' work experience and work-life balance, which have positive effects on job satisfaction, absenteeism, commitment and turnover (Kocak et al. 2018; D. E. Schmidt and Duenas 2002). In particular, absenteeism, both when belonging to the excused and non-excused category (G. J. Blau 1985) has important direct and indirect costs for organizations (Navarro and Bass 2006). If the costs of absenteeism, and consequently ways to reduce such costs by improving the workplace experience, need to be considered in all sectors, an even more careful approach needs to be implemented in the public sector. In a context where goals consist typically in achieving efficiency and some measure of equity instead of profit maximization, it creates a situation in which individuals are difficult to incentivize and difficult to monitor (S. Burgess and Ratto 2003). Moreover, because the public administration deals with budgetary constraints, it doesn't allow big rewards (Miller and Whitford 2007). Yet, incentives are present in the public sector, for ex-

ample in Italy they are part of the DL15/2009 in which the legislator incentivizes individual performance by creating rankings that correspond to different monetary rewards. However, studies confirm the idea that public sector workers are more intrinsically motivated than their counterparts in the private sector (Buelens and Van den Broeck 2007; Perry 1997), and as suggested by self-determination theory (E. Deci and R. Ryan 1985), extrinsic rewards can undermine intrinsic motivation with potential negative impacts on performance. In particular, the effects on workers engaged in activities that have a prosocial impact seem to have a crowding out effect on motivation, while symbolic rewards don't seem to have an impact on motivation (Bellé 2015). In order not to impact intrinsic motivation, but still manage to improve working outcomes such as absences at work, job design could be a valuable alternative to monetary rewards. Therefore, in order to improve the working experience and reduce absenteeism rates, job design could be one of the starting points to better understand the mechanisms that lead to this result. Thus, given the importance for employers to reduce absenteeism and the positive effects on workers of working time flexibility, which is both in the job design and work-life balance toolbox, we should consider working time flexibility as an effective tool to improve productivity and performance of organizations (P. Berg et al. 2004).

Although there already is a large literature investigating the benefits of specific practices aimed to improve work-family balance including working time flexibility and its positive effects in reducing absenteeism, research designs still need to be improved to understand the real impact of these initiatives. In particular in their review, Kelly et al. (2008) suggest the use of longitudinal studies and experimental or quasi-experimental designs to tackle these issues from a different perspective.

This study examines the impact of a specific form of flexible work schedule on absenteeism and hours worked. We use panel data of a public health agency in Italy which introduced a flexitime program for employees in recent years. The contribution of the paper is twofold. First, we wish to approach the analysis of absenteeism using a quasi-experimental design, and in order to understand the effects of the program, we analyzed the data using the statistical technique of matching in different consecutive years. Second, we try to understand whether the use of a job design tool such as flexitime, has a positive impact on work outcomes, confirming the idea that the use of non-monetary incentives in the public sector, where

workers display higher levels of intrinsic motivation, can be a valuable alternative to monetary incentives.

The chapter proceeds as follows. In Section 3.2 we provide a review of the existing literature on absenteeism in the public sector, the relationship between absenteeism and work-family conflict focusing on flexible working time arrangements as a tool to reduce absenteeism and the role of motivation in designing and implementing these practices. Section 3.3 presents the methodology of this study and the data used for our analysis. We present our results in Section 3.4 and the discussion of this study in section Section 3.5.

## 3.2 Literature review

Absenteeism should be considered a crucial point for organizations as it can be a source of direct and indirect costs (G. J. Blau 1985). Among direct costs we find overtime and replacement costs: when a worker is absent, others might need to cover for the missing worker and employers can choose between extending working hours of present workers or hiring another worker to maintain the same level of output. There are also important indirect costs of absenteeism: organizations face loss of productivity linked to worker replacement, and loss of productivity of co-workers and supervisors. In the case of worker replacement, organizations will lower productivity because a new worker might need time to learn the job or get accustomed to organizations' practices. Moreover, an absent worker could add extra responsibilities to existing co-workers, which might add stress and damage productivity. Supervisors instead, might need to take time off their main responsibilities to deal with the absence of a single worker in terms of rearranging jobs under his supervision to maintain the same output.

Although there is no specific definition of absenteeism, in this paper it is useful to use the framework provided by Beil-Hildebrand 1996 who recognized that absences can be either voluntary or non-voluntary and planned or unplanned, bringing to four different types of absenteeism. While a planned absence creates no difficulties to employers, who expect workers not to come to work and are able to plan activities accordingly, as in the case of holidays or training, it is unplanned absences that bring to the direct and indirect costs previously mentioned. If not voluntary, unplanned absences are related to sickness, injury or contingent problems. If voluntary instead, employees not showing up at work either fail to

provide a valid reason for their absence or make use of other types of absences for personal matters (e.g., self-reporting minor illness to carry out personal duties). Previous research suggests that sickness absences can be detrimental on firm productivity (Selekler et al. 2015), nonetheless there are peculiar aspects linked to the different kinds of absences. Ford 1981 found that holiday absences systematically increased with reductions in sick leave absences, while Vahtera et al. 2001 found that it is easier to find one day absences on Monday and Friday compared to other days of the weekend. Moreover, Böheim and Leoni 2020 show that employees tend to use vacation days rather than sick leave on "bridging days" (i.e., days between weekend and holiday) highlighting how even if theoretically different, absences can be interconnected and strategically used by workers.

### 3.2.1 The Job Characteristic Model and Evidence from the Public Sector

Hackman and Oldham (1980) developed the idea into what they called Job Characteristics Theory which says that "the presence of certain attributes in jobs increases the probability that individuals will find the work meaningful, will experience responsibility for work outcomes, and will have trustworthy knowledge of the results of their work" (Oldham and Hackman 2010). These attributes should be able to contribute to the meaningfulness of the job increasing levels of intrinsic motivation, leading to both higher job satisfaction, higher productivity and lower absenteeism and turnover (Rentsch and Steel 1998). In practice, job design is carried out in two main ways: job rotation and job enrichment, which have positive impacts on both job satisfaction and motivation. Job rotation is a system which allows employees to rotate from one job to the other, taking into account their knowledge, skills and capacity in order not to place them in inappropriate positions. This system seems to have several advantages among which increased productivity, training possibilities and motivation. It also seems to foster employee learning and help employees to gain a better insight on the organization's operations. Job enrichment instead, refers to those practices which motivate people to perform better, by the use of personal abilities, feedback and enhanced autonomy on the workplace. Job enrichment has been found to be positively correlated with motivation, feedback seeking behavior and higher involvement of employees in decision making processes (Belias and Sklikas 2013). Linked to the concept of job design there is job crafting which departs form the idea that the design of work can only be top-down and leaves

the possibility that it is directly employees who participate in shaping and customizing their own work or at least to discuss with their managers on how the job might be modified. This way of organizing jobs is supposed to bring meaningfulness to the job which in turn leads to positive work attitudes which affect performance.

Effects of job design practices have been addressed by researchers leading to interesting results. Golembiewski and Proehl (1980) specifically reviewed results of empirical studies connected to the introduction of flexible work hours in the public sector. The adoption of such system according to their analysis led to changes in various indicators such as sick leave or absenteeism, tardiness, turnover, trending costs and productivity. In specific, all indicators seem to decrease, while productivity, where captured, seems to be positively impacted by programs of this kind. However, other researchers found that positive effects of job design seem to be more effective in the private sector, where extrinsic reward systems are much more used, while in the public sector workers don't seem to respond in the way job characteristics theory would suggest. The presence of the attributes mentioned above doesn't seem to be able to make up for the lack of extrinsic rewards (Locke et al. 1976). Moreover, a recent study form Chen (2018) suggests that in the public and non-profit sector it would be often best to "pay enough or don't pay at all", and further confirms the idea that public sector workers are more intrinsically motivated than their counterparts in the private sector. However, because the public sector usually faces budgetary constraints, it is difficult for these organizations to provide satisfying reward systems, which poses a significant problem as employees with favorable job content perceptions, but low performance-rewards expectations seem to have higher absenteeism rates (Hirschfeld et al. 2002).

### 3.2.2 Work-family balance programs and Motivation

Programs and practices aimed at improving employee well-being have shown to be related to organizational performance to the extent to which they contribute to improve the so-called work-family conflict (Kelly et al. 2008; S. Wood et al. 2012), and can be considered as employee benefits specifically provided by organizations (Gallup 2017; D. E. Schmidt and Duenas 2002). When these practices are able to improve the conflict which arises in workers who feel that pressures from one role are incompatible with the pressures from the other role (Moen et al. 2008), they have positive impacts on a number of work attitudes

such as job satisfaction, organizational commitment and turnover intentions (T. D. Allen 2001). Workers displaying high levels of work-family conflict often display also high levels of burnout and stress (Bacharach et al. 1991), which in turn affects absenteeism rates (Hendrix et al. 1994). The relationship between stress and absenteeism was first thought to direct, with researchers suggesting that it is stress that causes absenteeism (Hill and Trist 1953), and researchers suggesting the other way around (Manning and Osland 1989). However, the study of Hendrix et al. (1994) on civilian employees working in public agencies in the United Sates proposes the indirect effect of stress on absenteeism through its effect on well-being factors such as emotional exhaustion, somatic symptoms or cold/flu episodes. Their study also suggests that women usually experience higher levels of stress, lower wellbeing and higher absenteeism rates compared to men. This result may be linked to the traditional role of women who spend more time dealing with child and home care responsibilities. Thus, practices that improve work-family conflict by reducing stress should take particularly into account the needs of women and should have a stronger impact on their absenteeism rates. One of the tools aimed at this result is Employee Assistance Programs analyzed by Nunes et al. (2018). Their work underlines how these programs can be beneficial for workers who experience mild-to-moderate levels of stress both if they were seeking help for coping with stress issues at work or not. Results seem however to be less effective for workers with severe psychological difficulties or illnesses but prove that providing programs designed to improve the experience of employees on the workplace is able to reduce absences.

Another interesting link between flexible working schedules and absenteeism is perceived autonomy. The fact that when workers are granted higher working hour flexibility, and consequently improve work attitudes and behaviors such as job commitment, job satisfaction, performance and absenteeism (Pierce and Newstrom 1980) led some researchers to believe that the perceived autonomy of managing part of one's own schedule, or in other words, the autonomy workers perceive, plays an important role in improving worker's attitudes and behaviors (Hackman and Oldham 1980). Researchers' findings suggest that there is a positive relationship between the level of autonomy of time and organizational performance, and placing employees in positions that match their preferences towards time can become a source of competitive advantage for organizations who can expect better performances form their workers (Lim and Seers 1993). Pierce and Newstrom (1983) in their study of insurance

employees working with different working schedules provided evidence that autonomy acts as a mediator between flexible working time arrangements and attitudes at work. Moreover, they strengthen the idea that employees should always be able to identify and experience the degree of autonomy given by their arrangements, suggesting an employer-employee joint effort in schedule designing. Edwards (2017) also identifies the important role of perceived autonomy in determining public employees decision to attend work, while public service motivation, which is often cited as one of the motivations that drives workers that feel a sort of alignment with public sector goals (Perry 1997), seems to have no role in shaping workers' decisions to attend work.

Particular attention should also be given to the view delineated by psychological economics and self-determination theory which argues that there are different types of motivation. In this view it is believed not only that people have different levels of motivation, but also that context and task characteristics are able to influence motivation of workers (Richard M Ryan and Edward L Deci 2000). According to these researchers one important distinction to be taken into consideration in the design of incentive and benefit schemes is the one between intrinsic and extrinsic motivation. The former stems from objectives that are related to the individual's sense of the right thing to do, while the latter derives from their interest in obtaining rewards offered by others. The cognitive evaluation theory tries to explain the effects of external factors on internal motivation. The theory suggests "social-contextual events (including rewards) that conduce towards feeling of competence during action can enhance intrinsic motivation for that action" (Richard M Ryan and Edward L Deci 2000). However, this is not enough, as intrinsic motivation will show only if people perceive their behavior as self-determined. When external factors such as extrinsic rewards, but also deadlines or pressured evaluations, facilitate the perception of a more external locus of causality, they can undermine intrinsic motivation. Thus, being able to have more control over working schedules should preserve intrinsic motivation levels.

The importance of absenteeism is not just a matter of workers well-being, but is a crucial point for organizations, which should try to reduce absenteeism rates in order to avoid costs and increase performance. Yet especially in the public sector, which struggles to provide employees with satisfying extrinsic rewards, the effects of flexible work arrangements on performance related outcomes are still ambiguous (De Menezes and Kelliher 2011). Wessels

et al. (2019) argue that the negative results of flexibility measures are due to an essential misfit between flexible arrangements and task demands. If work tasks do not match with increased flexibility, results will not be effective.

Previous research mainly relies on self-reported answers in surveys, which makes it harder to understand the real effects of such programs on the employer's side. Also, Kelly et al. (2008) highlighted the need for more rigorous analyses to capture the effects on attitudes of work-family balance initiatives using experiments, quasi experiments and longitudinal data. This study aims at understanding the effects of a flexitime program for workers in a public healthcare agency in Italy. Data used regards the actual absence of workers over a four-year time period. In addition, we have absences classified in different categories belonging to both the planned and unplanned categories, which allows for a more specific understanding of the decision to attend work of public workers. The positive effect on unplanned absence rates would further confirm that in the public sector in which levels of intrinsic motivation are different from the private sector, tools different from monetary incentives are able to influence work outcomes.

## 3.3 Methods

### 3.3.1 Sample and description of the flexitime program

This study was developed using data from a public health agency in Italy, which implemented a flexitime and telework program as a pilot project in 2009 and perfectioned it until it became fully operative in January 2015. The main objective in developing this program was the improvement of workplace employee satisfaction which in turn should have positive effects on the quality of life of employees. In particular, by adopting this program the agency aimed at improving employee-supervisor relations and encouraging a stronger involvement of workers in decision making processes. Employee satisfaction is strongly linked to customer satisfaction (Heskett et al. 1997) and a motivated staff is shown to perform better, to be able to provide a higher quality service to customers and to have lower turnover rates (Koys 2001).

The flexitime program allows all agency employees to apply except for those working on shift schedules or in particular areas due to organizational or structural reasons. Working schedules can be customized for entire units or for single employees and does not imply

any change in remuneration or total amount of working hours during the year. In order to guarantee the correct operation of all units, employees and supervisors not only agree on the new schedule but set goals and KPIs for an entire year. After 12 months (and indicatively each year around March/April) the agreement expires and employees either renegotiate the agreement for the next year or quit the program and return to a fixed standard schedule.

The dataset used for this study contains information for 8082 public employees who could potentially apply to the program and worked for the local health agency analyzed between 2015 and 2018. Because of the program design the employees in the dataset are various in both demographics and tasks with a stronger presence of clerical workers as most healthcare professionals work on shift schedules. Employees participating to the program are each year a subset of the total of observations and will be hereon considered as our treatment group while the rest of workers form our control group. We collected data on the number of yearly absence hours of each worker divided in different categories. The agency in fact, classifies absences according to the different reasons that bring to an absence. In particular the different categories are holiday, sick leave, training and other absences.

### 3.3.2 Data analysis

The analysis of the effectiveness of a voluntary flexitime program must consider that very like employees participating in the program are not randomly selected. To address this problem, we should ensure that the two groups we are going to compare are similar. Therefore, we first analyze the composition of the two groups of employees in the sample, namely those who participated in the program and those who did not. Since our dataset contains all employees present in each year including those hired and retired during this period, we will also check the distributions of variables in the subpopulation of workers always present during the four years considered compared to the entire population. The choice to concentrate on workers present in all years for our analysis allows us to control for experience. In fact, time management for newly hired employees, who still need to get accustomed with the environment, and people close to retirement may be different from employees who are already accustomed to organization's environment and workload and are not planning to leave in the short term. We will then perform three different tests that allow to check the effects of the flexitime program during the selected period.

As a first simple test we will perform a Wilcoxon signed-rank test to check whether the distribution of new entrants in the program in each year display significant differences in outcome variables compared to the year before. This step only tells us whether the distributions have different means before computing a more detailed analysis to assess the magnitude and direction of the differences. As a second step, we propose two difference-in-differences (DiD) models combined with matching approach. The first will estimate effects using Propensity Score Analysis, allowing to test the effects of the program in 2018 compared to 2015. With this step, we provide a long-term result of the program, which is however not very precise, as we don't consider the different years in which employees enter the program. The second, will be carried out using `flexpaneldid`, a Stata toolbox that allows to take into account the peculiar aspect of this dataset, namely the fact that employees can start the program in each of the years considered. With this last step, we will test the effects of the program one year after the start, providing short term yet more precise results of the program.

**General profiles of workers and descriptive statistics of the sample** Table 3.1 displays employees who participated in the program during at least one of the four years considered. In each year we see how many people entered the program and how many quit, not considering retired employees in the quit column, as they did not quit due to a specific decision linked to the program.

| | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Flexitime program | 23 | 649 | 625 | 626 |
| New | - | 632 | 51 | 83 |
| Quit | 0 | 6 | 38 | 28 |
| Others | 6756 | 6271 | 6324 | 6422 |
| Total employees | 6779 | 6920 | 6949 | 7048 |

Table 3.1: Total number of employees in the dataset. Note: New row counts employees who entered the program at the beginning of the year, Quit row counts how many employees quit the program at the beginning of the same year for reasons other than retirement.

Figures 3.1 to 3.4 display for each year the general profiles of workers in the two groups.

The year 2015 shows the most differences in proportions between the treatment and the

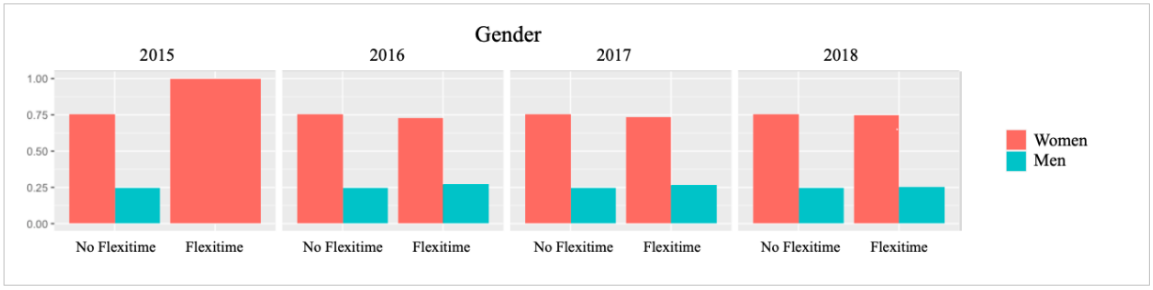



Figure 3.1: Gender distribution of employees participating in the flexitime program and of all other employees in the whole dataset, divided by year

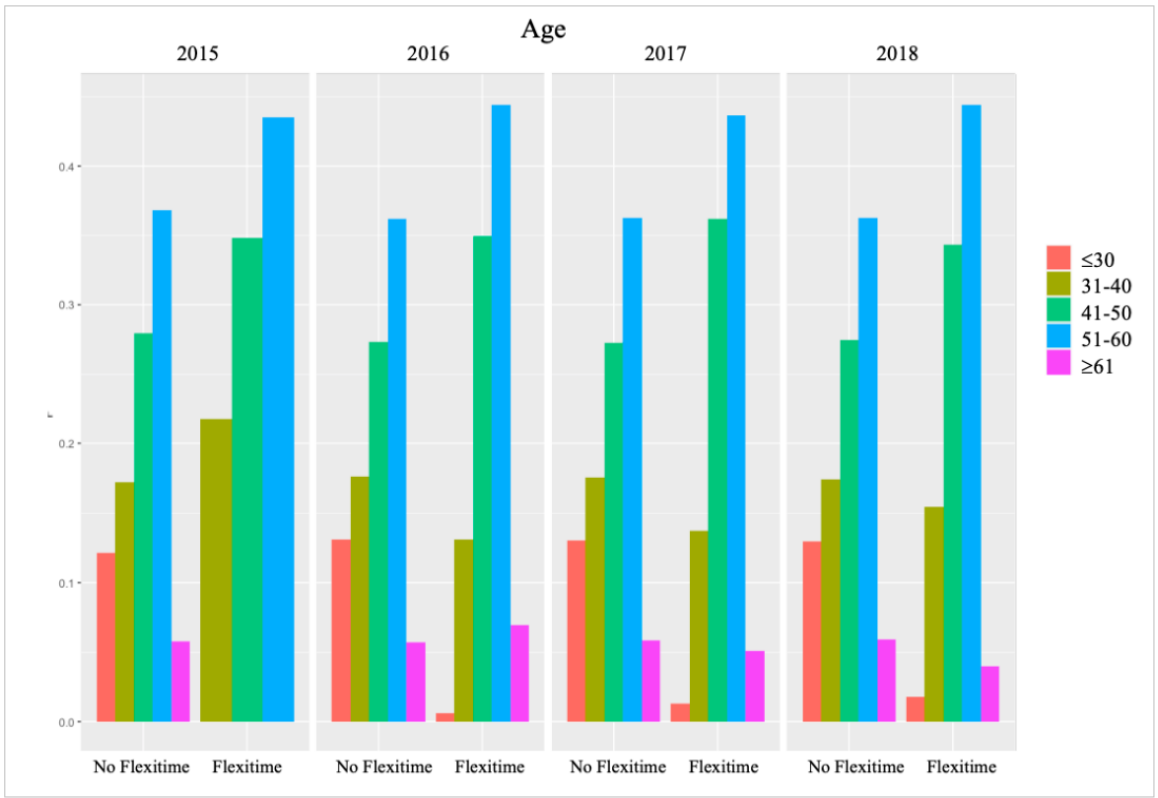



Figure 3.2: Age distribution of employees participating in the flexitime program and of all other employees in the whole dataset, divided by year

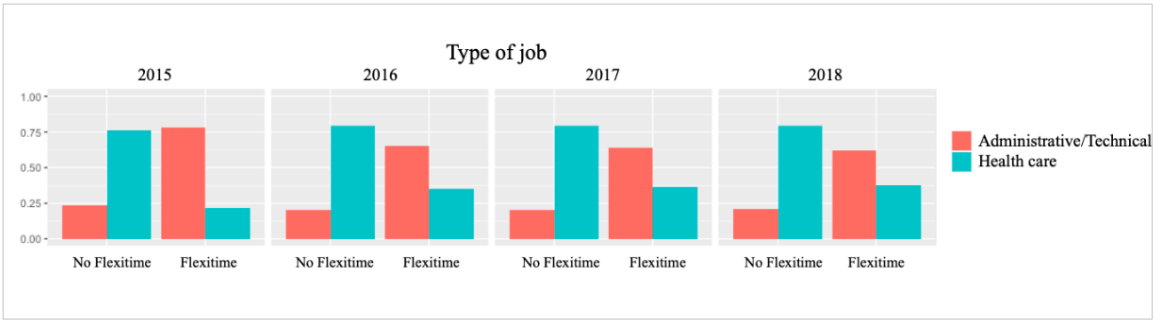



Figure 3.3: Type of job distribution of employees participating in the flexitime program and of all other employees in the whole dataset, divided by year

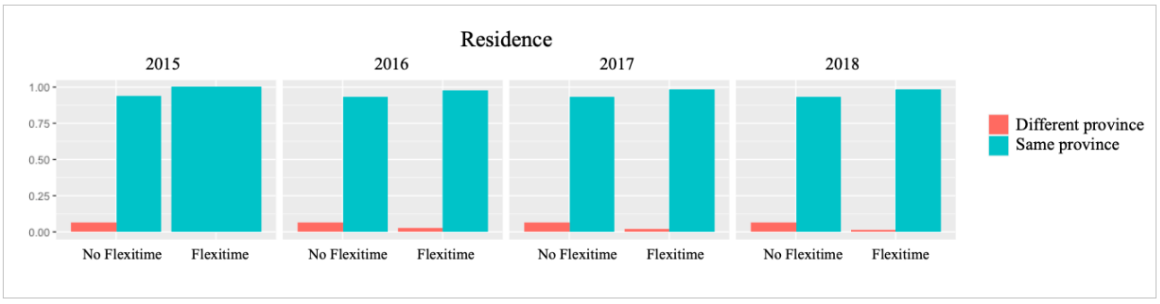



Figure 3.4: Residence distribution of employees participating in the flexitime program and of all other employees in the whole dataset, divided by year

control group probably because it was the first year in which the flexitime program was available for all eligible employees, and the people who applied were relatively few. As a matter of fact, the number of people who applied is significantly higher in the following years. In other years the two groups don't seem to differ in significant ways except for the type of job they performed. As previously stated, we will use for our analysis only the employees who worked for the agency for four consecutive years (Table 3.2) and therefore we checked the distributions of this subset of the population (Figures 3.5 to 3.8 and table 3.2) and overall the distributions don not significantly differ from those of the entire population, indicating that as far as general characteristics are concerned, the subgroup analyzed is quite similar to the whole sample.

| | 2015 | 2016 | 2017 | 2018 |
|---|---|---|---|---|
| Flexitime program | 17 | 556 | 561 | 593 |
| New | - | 544 | 42 | 58 |
| Quit | 0 | 5 | 37 | 26 |
| Others | 5796 | 5257 | 5252 | 5220 |
| Total employees | 5813 | 5813 | 5813 | 5813 |

Table 3.2: Total number of employees present in each of the four years. Note: New row counts employees who entered the program at the beginning of the year, Quit row counts how many employees quit the program at the beginning of the same year for reasons other than retirement.

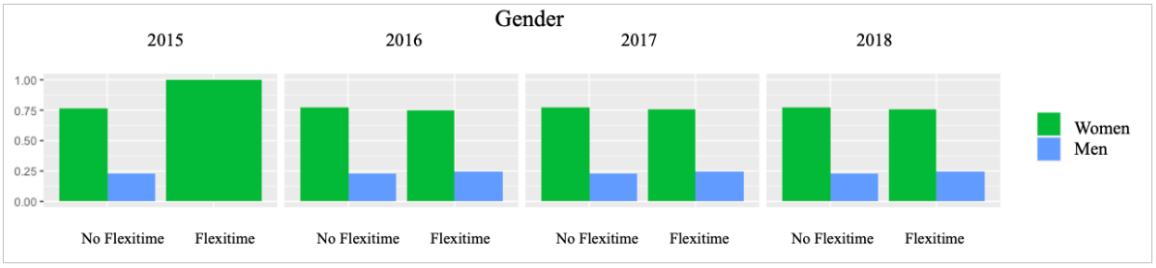



Figure 3.5: Gender distribution of employees participating in the flexitime program and of all other employees present in each of the four years, divided by year

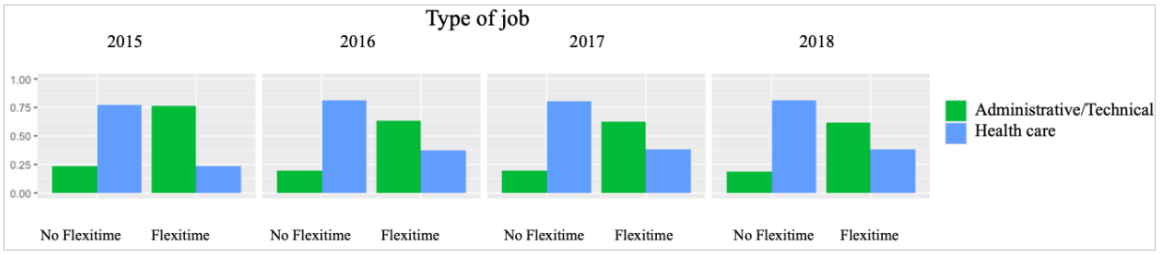



Figure 3.6: Type of job distribution of employees participating in the flexitime program and of all other employees present in each of the four years, divided by year

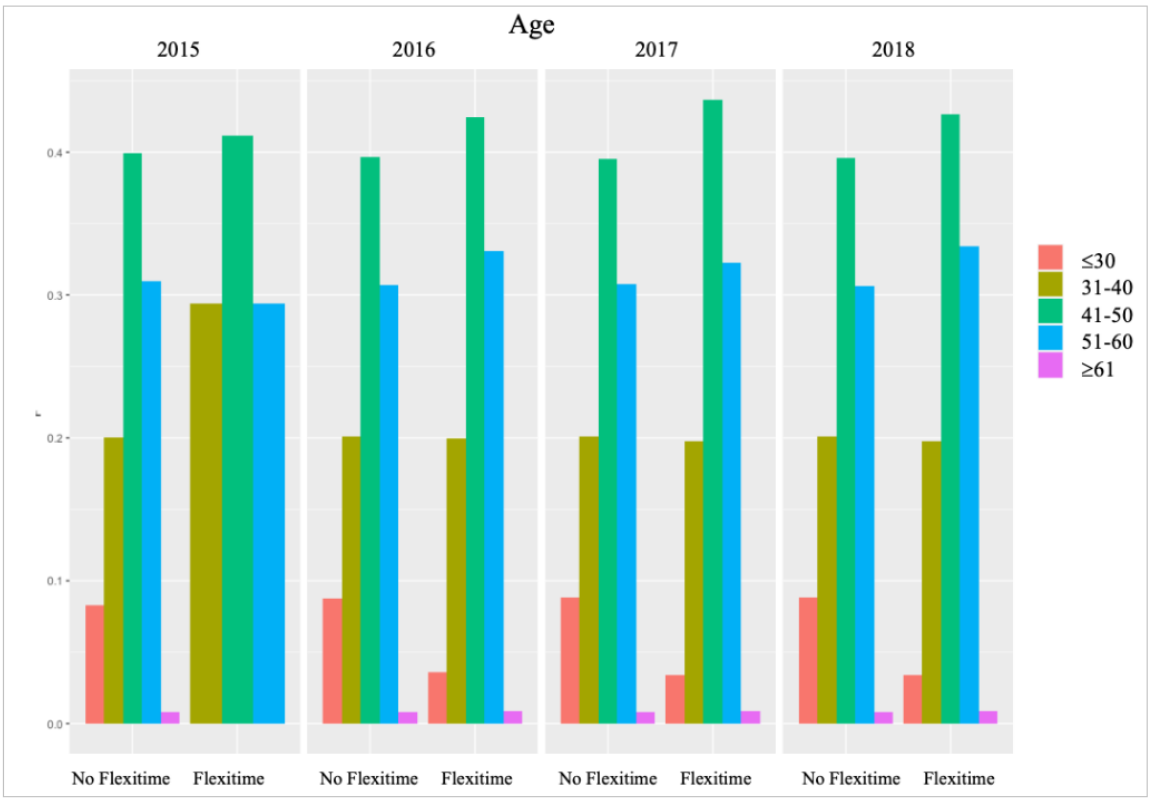



Figure 3.7: Age distribution of employees participating in the flexitime program and of all other employees present in each of the four years, divided by year

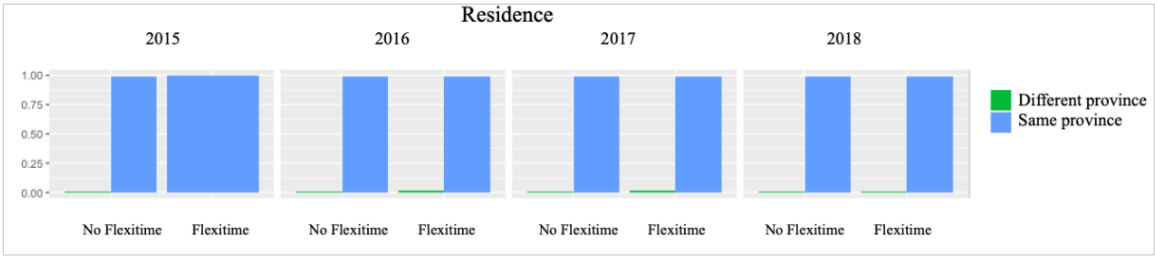



Figure 3.8: Residence distribution of employees participating in the flexitime program and of all other employees present in each of the four years, divided by year

Tables 3.3 and 3.4 displays descriptive statistics on the variables related to absenteeism in the treated and control group, by year.

| | Mean | Median | SD | Min. | Max. | 1st Quart. | 3rd Quart. |
|---|---|---|---|---|---|---|---|
| 2015 | | | | | | | |
| Total Absences | | | | | | | |
| Treated | 383.9 | 307.6 | 264.03 | 0.0 | 1821.6 | 254.0 | 397.0 |
| Control | 371.8 | 281.8 | 310.64 | 0.0 | 1828.8 | 221.1 | 396.3 |
| Sick leave | | | | | | | |
| Treated | 48.25 | 21.6 | 88.83 | 0.0 | 1117.6 | 0.0 | 55.12 |
| Control | 54.74 | 20.0 | 113.95 | 0.0 | 1821.6 | 0.0 | 57.6 |
| Holidays | | | | | | | |
| Treated | 210.0 | 219.6 | 54.22 | 0.0 | 453.6 | 180.0 | 241.2 |
| Control | 192.4 | 201.6 | 70.04 | 0.0 | 552.0 | 156.0 | 234.0 |
| Training | | | | | | | |
| Treated | 12.31 | 4.0 | 20.32 | 0.0 | 159.9 | 0.0 | 18.0 |
| Control | 10.1 | 4.4 | 15.76 | 0.0 | 161.5 | 0.0 | 14.4 |
| Other Absences | | | | | | | |
| Treated | 54.345 | 16.583 | 131.35 | 0.0 | 1821.6 | 5.875 | 38.246 |
| Control | 40.73 | 6.0 | 129.73 | 0.0 | 1821.6 | 0.0 | 21.82 |
| Hours Worked | | | | | | | |
| Treated | 1317 | 1447 | 326.37 | 0.0 | 1879 | 1173 | 1542 |
| Control | 1294 | 1433 | 404.34 | 0.0 | 2138 | 1105 | 1578 |
| Overtime Hours | | | | | | | |
| Treated | 10.745 | 4.025 | 25.4 | -151.0 | 147.4 | 0.0 | 17.033 |
| Control | 11.59 | 3.35 | 29.09 | -109.93 | 427.17 | 0.0 | 18.52 |
| 2016 | | | | | | | |
| Total Absences | | | | | | | |
| Treated | 386.5 | 297.6 | 276.2 | 72.8 | 1814.4 | 245.6 | 416.1 |
| Control | 384.1 | 289.6 | 304.51 | 7.0 | 1830.0 | 230.3 | 404.6 |
| Sick leave | | | | | | | |
| Treated | 50.4 | 21.6 | 100.92 | 0.0 | 1062.5 | 0.0 | 55.0 |
| Control | 56.54 | 17.5 | 119.12 | 0.0 | 1814.4 | 0.0 | 59.0 |
| Holidays | | | | | | | |
| Treated | 199.2 | 208.8 | 50.68 | 0.0 | 352.8 | 174.6 | 230.4 |
| Control | 203.2 | 208.8 | 65.47 | 0.0 | 576.0 | 168.0 | 237.6 |
| Training | | | | | | | |
| Treated | 10.87 | 1.5 | 18.07 | 0.0 | 132.12 | 0.0 | 14.5 |
| Control | 9.703 | 1.5 | 15.04 | 0.0 | 120.93 | 0.0 | 15.2 |
| Other Absences | | | | | | | |
| Treated | 64.81 | 16.62 | 156.22 | 0.0 | 1814.4 | 5.75 | 47.7 |
| Control | 44.08 | 7.0 | 132.29 | 0.0 | 1830.0 | 0.0 | 24.0 |
| Hours Worked | | | | | | | |
| Treated | 1313 | 1430 | 332.46 | 0.0 | 1824 | 1153 | 1545 |
| Control | 1311 | 1442 | 375.99 | -0.85 | 2278 | 1131 | 1576 |
| Overtime Hours | | | | | | | |
| Treated | 12.6636 | 4.8917 | 27.5 | -154.13 | 204.68 | 0.2292 | 16.06 |
| Control | 12.506 | 5.417 | 30.08 | -776.93 | 608.283 | 0.0 | 19.783 |

Table 3.3: Descriptive statistics of outcome variables for treated and control group by year (2015-2016)

| | Mean | Median | SD | Min. | Max. | 1st Quart. | 3rd Quart. |
|---|---|---|---|---|---|---|---|
| 2017 | | | | | | | |
| Total Absences | | | | | | | |
| Treated | 378.04 | 304.07 | 248.68 | 99.92 | 1792.8 | 246.47 | 411.12 |
| Control | 379.24 | 285.6 | 302.88 | 22.95 | 1812.0 | 227.15 | 402.25 |
| Sick leave | | | | | | | |
| Treated | 49.92 | 21.6 | 122.06 | 0.0 | 1447.2 | 0.0 | 50.4 |
| Control | 59.92 | 20.0 | 136.37 | 0.0 | 1792.8 | 0.0 | 60.0 |
| Holidays | | | | | | | |
| Treated | 205.4 | 211.3 | 52.71 | 0.0 | 550.8 | 176.2 | 234.0 |
| Control | 199.1 | 204.0 | 62.93 | 0.0 | 547.2 | 162.0 | 234.0 |
| Training | | | | | | | |
| Treated | 10.435 | 1.917 | 17.10 | 0.0 | 106.6 | 0.0 | 14.1 |
| Control | 10.65 | 4.0 | 15.88 | 0.0 | 152.58 | 0.0 | 16.5 |
| Other Absences | | | | | | | |
| Treated | 69.179 | 19.917 | 164.41 | 0.0 | 1792.8 | 7.017 | 57.638 |
| Control | 43.523 | 6.367 | 136.95 | 0.0 | 1806.0 | 0.0 | 23.05 |
| Hours Worked | | | | | | | |
| Treated | 1309 | 1413 | 312.43 | 0.0 | 1815 | 1180 | 1533 |
| Control | 1307 | 1429 | 369.73 | 0.0 | 2211 | 1120 | 1568 |
| Overtime Hours | | | | | | | |
| Treated | 15.561 | 8.142 | 26.39 | -69.317 | 203.95 | 1.454 | 20.337 |
| Control | 18.375 | 8.933 | 31.02 | -84.783 | 504.55 | 0.566 | 25.016 |
| 2018 | | | | | | | |
| Total Absences | | | | | | | |
| Treated | 384.73 | 305.31 | 267.73 | 55.25 | 1814.4 | 254.76 | 402.29 |
| Control | 387.7 | 294.3 | 303.95 | 27.0 | 1828.0 | 234.4 | 405.0 |
| Sick leave | | | | | | | |
| Treated | 45.46 | 14.4 | 101.65 | 0.0 | 1656.0 | 0.0 | 50.4 |
| Control | 61.36 | 17.25 | 142.97 | 0.0 | 1821.6 | 0.0 | 60.0 |
| Holidays | | | | | | | |
| Treated | 208.4 | 212.4 | 53.14 | 0.0 | 486.0 | 180.9 | 237.6 |
| Control | 204.3 | 208.8 | 64.12 | 0.0 | 651.6 | 168.0 | 240.0 |
| Training | | | | | | | |
| Treated | 12.134 | 3.675 | 19.37 | 0.0 | 166.167 | 0.0 | 17.438 |
| Control | 11.39 | 5.0 | 16.6 | 0.0 | 14.63 | 0.0 | 16.78 |
| Other Absences | | | | | | | |
| Treated | 72.676 | 18.5 | 195.95 | 0.0 | 1814.4 | 6.596 | 47.25 |
| Control | 50.111 | 7.717 | 166.25 | 0.0 | 1821.6 | 0.0 | 25.35 |
| Hours Worked | | | | | | | |
| Treated | 1320 | 1429 | 331.32 | 0.0 | 1898 | 1174 | 1550 |
| Control | 1302 | 1425 | 373.68 | -99.62 | 2065 | 1117 | 1569 |
| Overtime Hours | | | | | | | |
| Treated | 20.913 | 9.0 | 37.12 | -106.25 | 268.93 | 1.529 | 27.704 |
| Control | 22.129 | 13.267 | 34.13 | -118.3 | 455.41 | 2.617 | 31.367 |

Table 3.4: Descriptive statistics of outcome variables for treated and control group by year (2017-2018)

### 3.3.3 Estimation of effects using Wilcoxon signed-rank test

The main interest in this study is to detect significant changes in employee absences linked to the participation in the flexitime program. Therefore, the first test we performed before computing a detailed analysis was to check whether employees who participated in the program and worked for the agency in all four years considered, displayed any difference before and after entering the program. We have no information on the behavior before entering the program of employees who were already involved in 2015, therefore we checked only the subsequent years. We performed a Wilcoxon signed-rank test which is a non-parametric test that can be used in presence of matched groups and when data does not follow a normal distribution[1]. By analyzing the differences between sets of pairs this test is able to determine whether the two matched distributions are significantly different from each other, therefore have different means. The results of the Wilcoxon test (Table 3.5) show that in all years we find some significant differences in absences. Except for sick leave, absences of each type and hours worked display a significant change in the distribution mean compared to the year before. This means for example, that total absences in 2018 of employees who entered the program in the same year, were significantly different from the absences of the same people in the previous year. We may continue in our analysis trying to understand the magnitude and direction of such changes and how this behavior compares to that of employees who never entered the program.

**DiD combined with matching on employees present in all four years** The effectiveness of work-family balance initiatives has been previously addressed using surveys and or cross-sectional data which allow to capture effects in a specific point in time and lack the random assignment necessary to make strong causal claims. In this step we propose a difference-in-differences (DiD) combined with propensity score matching to analyze the effects of the flexitime program using data regarding employees from 2015 to 2018. Since we are interested in the effect after 3 years and our dataset contains all employees present in each year including those hired and retired during this period, in the next parts of the

[1]The use of a parametric test such as the t-test may not be appropriate in this case, as the sample in 2017 and 2018 is both small and skewed. In presence of skewed distributions a sample size of 200 would be recommended in order to avoid Type I error (Nguyen et al. 2016)

| | 2015-2016 | | 2016-2017 | | 2017-2018 | |
|---|---|---|---|---|---|---|
| | V | p-value | V | p-value | V | p-value |
| Hours worked | 73726 | 0.9735 | 569 | 0.1448 | 1233 | 0.003513*** |
| Overtime hours | 80080 | 0.04319** | 525 | 0.2232 | 1016 | 0.2154 |
| Sick leave | 47012 | 0.8779 | 400 | 0.4643 | 372 | 0.3231 |
| Holidays | 47626 | 3.659e-08*** | 375 | 0.48 | 770 | 0.8257 |
| Training | 29497 | 0.05318* | 248 | 0.3109 | 487 | 0.3007 |
| Other absences | 71221 | 0.1344 | 394 | 0.48 | 969 | 0.1643 |
| Total absences | 67478 | 0.07018* | 264 | 0.01827** | 765 | 0.4859 |
| Number of obs. | 544 | | 42 | | 58 | |

Table 3.5: Wilcoxon signed-rank test for new employees participating in the flexitime program for employees present in each of the four years. Note: $*** p < 0.01$, $** p < 0.05$, $* p < 0.1$. Significantly different distribution of outcome variables of each year compared to the previous year.

analysis we will use only data from employees present in each of the four years. Therefore, we checked again the distributions of variables in the subpopulation . Overall the distributions are quite similar to those of the entire population.

In this study, the treatment could not be randomly assigned, meaning that the rule by which people are assigned to treatment is not casual and the treatment and control group could have different key characteristics which affect the ultimate treatment effect. In this framework, Propensity Score Analysis (PSA) can be used in case of non-randomized studies to balance treatment and control groups in order to recreate the conditions of a random study using baseline characteristics (or covariates). The propensity score is an index that represents the probability of being treated conditional to some characteristics:

$$p(x) = Pr\{w = 1|x\} = E\{w|x\} \tag{3.1}$$

Rosenbaum and Rubin (1983) suggested that if it is possible to perfectly match on the propensity score then also the covariates of the treated and control group are expected to be balanced which implies that conditioned to $p(x)$, treatment and covariates are independent. Therefore, when comparing differences in mean between the treated and control group

matched using the propensity score allows to estimate Average Treatment Effect on Treated (ATT) which captures the average causal effect of the treatment assignment:

$$ATT = E(Y_1 - Y_0|W = 1) \tag{3.2}$$

The estimation of the ATT using propensity score matching requires different steps in order to be performed. The first step is the estimation of the propensity score for both the treatment and control group, which can be computed using a probit, logit or linear model specifying the covariates taken into account in the model. The second step consists in matching individuals in the two groups based on their propensity score, which can be done using different matching techniques such as Stratification, One-to-one nearest neighbor, Multiple nearest-neighbors, Kernel and Radius. Then a DiD will be performed by taking the differences between the treatment and control groups before and after entering the program. Specifically, in this step we apply propensity score matching using multiple nearest neighbors combined with a DiD for the different types of absences and hours worked separately.

### 3.3.4 Measures

The choice of covariates is crucial as propensity score analysis is based on the unconfoundedness assumption which requires that the treatment is independent of the outcome given the covariates included in the model. In this study, we use both personal characteristics and job's characteristics (ten Brummelhuis and Van Der Lippe 2010) related to participation in the program and absence rates and are well able to approximate the basis for selection into the treatment group. We use as baseline characteristics the information on individual's age, gender, residence place and type of job to create the propensity score and match people with similar propensity scores in the treated and control group. Age divides individuals in five categories: $\leq$ 30, 31-40, 41-50, 51-60, $\geq$ 61 [2]. Residence specifies whether the individual works in the same province as the health care agency or not. Type of job describes whether employees are health care workers from workers or have administrative or technical jobs.

We assess the effectiveness of the flexitime program through the absence hours of employees during the year. Previous research suggests that flexitime programs should reduce absenteeism rates among workers, we observe whether the program (the treatment) is able

[2]Due to privacy reasons we were not able to work with specific information about age or residence place.

to produce significant differences in absences, overtime work and total hours worked among people who participated between 2015 and 2018. First, we observe whether participants in the program display differences in total absences, which gathers all the office hours in which an employee is not in the office. Second, we breakdown absences in three different categories: holidays, sick leave and other absences in order to understand the effects of the program on different types of absences. Third, because one of the program's aims is to improve employees' quality of life by increasing job satisfaction, we also observe differences in labor input and overtime. Employees not showing up at work because of work-family conflict issues should be able to better organize their time when participating in the program, with positive effects on labor input, measured as the total amount of hours worked during the year and a reduction in overtime hours. However, those not showing up for motivational issues may use the autonomy of the flexitime program for selfish reasons which might translate in a lower availability to meet organizations' contingent need for extra effort. Thus, we might observe the same result, i.e. a reduction in overtime hours, for two distinct reasons.

### 3.3.5 Estimation of the ATT using Propensity Score Analysis

Following the steps previously described we first calculate the propensity score for both the treated and control group using a probit model, which predicts for each individual the probability of being treated given the covariates in our model. Then we perform Multiple Nearest-Neighbor Matching on propensity scores of individuals in the two groups with replacement and common support restriction[3]. The replacement option allows an observation in the control group to be used as a match for multiple observations in the treated group, in case its propensity score is close to the one of a treated observation. The common support restriction instead, allows treated observations to be matched only if their propensity score lies between the minimum and the maximum propensity score of the control observations. For each employee in the dataset we also calculate changes in the outcome variables. For employee $i = 1, 2, \ldots, I$ as $\Delta Y_i = Y_{i,t+k} - Y_{i,t-1}$ and we compare the outcomes after entering the program compared to the ones before the treatment. We are then able to calculate the average treatment effect on treated (ATT) which describes the average effects of the

[3]We used $N = 75$ considering the number of individuals we had in our dataset and after checking for the point in which A.I. standard errors were lower. We tried with several different levels of $N$ and results did not change in terms of sign or significance and did not differ much in terms of hours results.

work-family balance program.

### 3.3.6 Estimation of the ATT using `flexpaneldid`

The structure of the dataset required particular attention in the choice of the most fitting tool for the analysis. In our panel dataset the start of the treatment is not the same for everyone. As the flexitime program was fully implemented in 2014 and employees can choose to enter or quit the program on a yearly basis, the treatment can start and also end in each of the years we considered. Since the environment might be heterogeneous over time and this might influence workers' outcomes, it is important to compare workers who started the program in the same year, in order to avoid the so called "calendar time effect". The aim of this final step in the analysis is indeed that of including the information given by the time of entry and exit in the program in the matching process. Therefore, when finding a match for each treated unit we add another element which is time and look for potential partners in the moment the treatment starts, changing the standard conditional DiD model into a flexible conditional DiD model. The `flexpaneldid` toolbox for Stata (Dettmann et al. 2020) allows to deal with panel datasets in which the treatment start and the treatment period is not the same for all observations. We first pre-processed our data to match treated and non-treated workers. The matching variables used are the same we used in the previous model (i.e. Gender, Age, Residence, Type of job) plus the year of the observation. Preprocessing creates a pool of potential controls for each treated observation, necessary to continue the analysis (Table 3.6).

| | |
|---|---|
| Number of treated | 660 |
| Number of treated dropped during preprocessing | 3 |
| Number of treated after preprocessing | 657 |
| Mean size of selection groups | 486.364 |

Table 3.6: Results of the preprocessing step using `flexpaneldid`

Moreover, to correctly implement the `flexpaneldid` toolbox it was necessary to use exact matching. After preprocessing, we are able to compute the ATT using flexible conditional DiD which compares individual differences in outcomes between the treated workers $i$ and their controls $j$. The final estimator, which is the mean of individual comparisons, includes

the start of the treatment $t_{0i}$ and the duration of the treatment $t_{0i} + \beta_i$.

$$ATT = \frac{1}{I} \sum_{i=1}^{I} [(Y_{i,t_{0i}+\beta_i} - Y_{i,t_{0i}}) - (Y_{j,t_{0i}+\beta_i} - Y_{j,t_{0i}})] \tag{3.3}$$

Since the dataset contains four years of observations and therefore it is hard to find employees who joined for several years before testing the outcomes, we selected options that best suited our case. First, we matched employees in the exact year of the treatment start, in order to control for context and policy changes that might have occurred in those years. By doing so, we assume that potential changes affected all employees in the same way. Second, we tested the outcomes one year after the start of the treatment in order to test the effects of the program after the very first year of treatment and to include also observations from the last years available, which would have not been possible if we observed outcomes after 2 or more years, because we then would be considering only workers who joined the program in 2015 or 2016. In this way, data from 2018 only serves as the outcome for employees entering in 2017, as missing data from 2019 does not allow to use entrants of 2018. Furthermore, we applied the option ties, which allows all non-treated observations with equal distance from the treatment observation to be used as partners for the counterfactual. The results of the two models developed using standard conditional DiD and flexible conditional DiD are presented in the next paragraph.

## 3.4 Results

### 3.4.1 Model 1

Here we present the results for the model Table 3.7, balance tests Table 3.8 and the relative balance plots Figures 3.9 and 3.10.

These are results obtained comparing outcomes of employees working in the health agency for four consecutive years in 2015 and 2018. In this four-year period, we notice that only in one case the model returns significant results: the case of holiday absences. For all the other outcome variables we don't detect any significant difference that might lead to the thought that the flexitime program implemented is in effective in reducing the absences of workers. The ATT result for total absences, which gathers all the types of absences considered, displays a negative sign and a coefficient of $-13$. This means that the average effect on those who were treated is a reduction in total absences of 13 hours compared to the average in 2018,

| Outcome | ATT | A.I. robust S.E. | z | P> \| z \| | 95% Conf. Interval | |
|---|---|---|---|---|---|---|
| Total Absences | -13.0109 | 12.37823 | -1.05 | 0.293 | -37.27178 | 11.24999 |
| Sick leave | -4.90744 | 5.842255 | -0.84 | 0.401 | -16.35805 | 6.543169 |
| Holidays | -8.650696 | 2.908085 | -2.97 | 0.003** | -14.35044 | -2950954 |
| Training | -1.03477 | 0.8440803 | -1.23 | 0.220 | -2.689137 | 0.6195966 |
| Other Absences | 5.011989 | 8.574441 | 0.58 | 0.559 | -11.79361 | 21.81758 |
| Hours worked | -5.586111 | 13.35249 | -0.42 | 0.676 | -31.75651 | 20.58429 |
| Overtime hours | 0.8126027 | 1.601278 | 0.51 | 0.612 | -2.325844 | 3.95105 |
| Number of observations: 5813 | | | | | | |
| Matches requested:75 | | | | | | |

Table 3.7: Changes in hours by conditional DiD 2018 vs 2015 of employees present in each of the four years. Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

| | Standardized differences | | Variance ratio | |
|---|---|---|---|---|
| | Raw | Matched | Raw | Matched |
| Age | 0.1352942 | -0.0164485 | 0.795394 | 00.9854923 |
| Gender | 0.0137484 | 0.0093586 | 1.018831 | 1.011892 |
| Type of work | -0.9496782 | -1.05e-15 | 1.577044 | 1 |
| Residence | -0.0844849 | -0.0331051 | 1.041884 | 1.328229 |

| | Raw | Matched |
|---|---|---|
| Number of obs | 5813 | 11626 |
| Treated obs | 660 | 5113 |
| Control obs | 5153 | 5813 |

Table 3.8: Balancing test: 2018 vs 2015

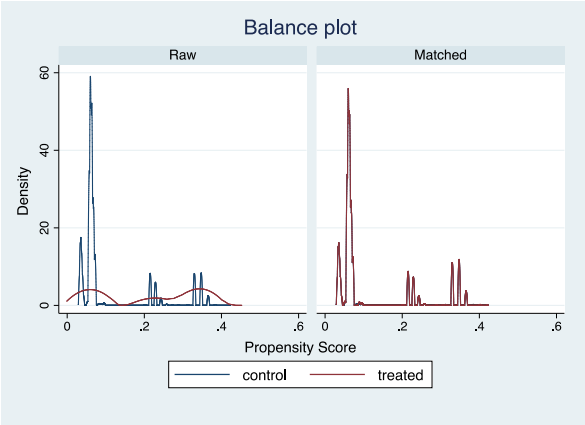
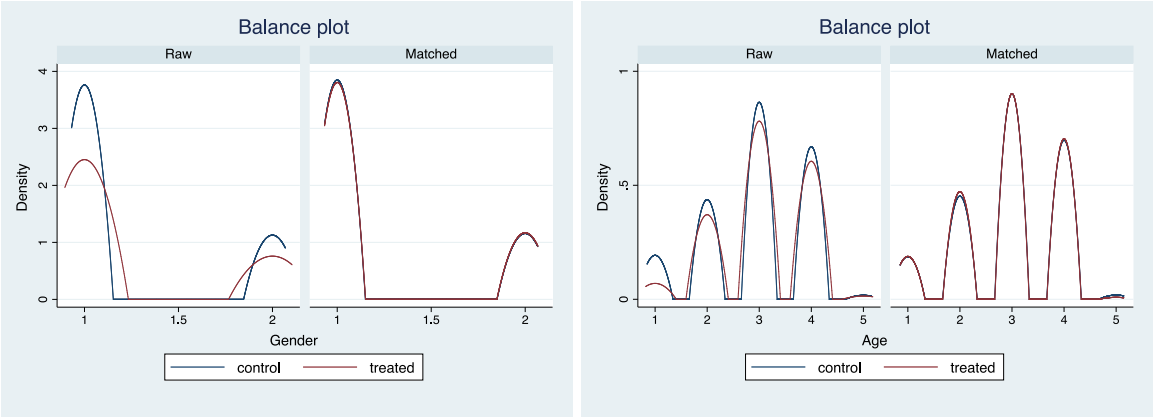


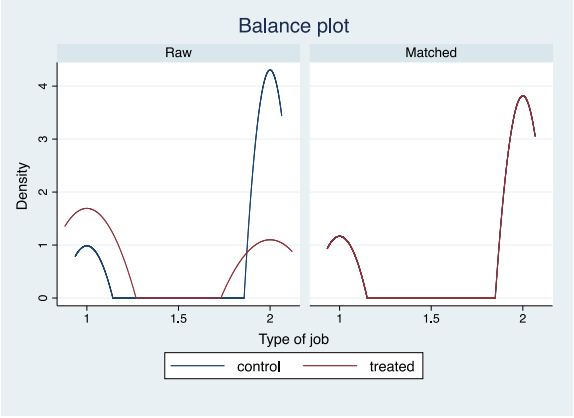

Figure 3.9: Propensity scores for treated and controls before and after match: 2018 vs 2015



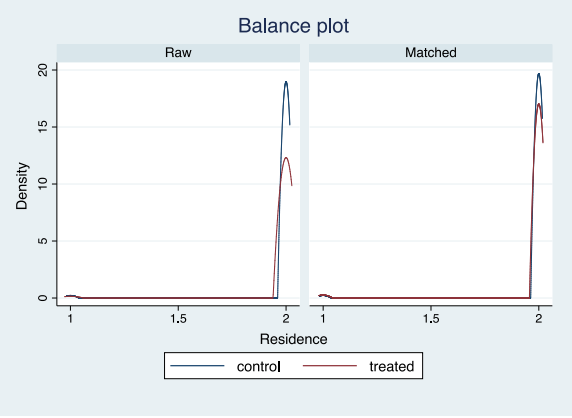

(a)




(b)




(c)




(d)

Figure 3.10: Diagnosis of the balance after matching for covariates: (a) Gender, (b) Age, (c) Type of job, (d) Residence

which, even though not significant for the model, are the equivalent of almost 2 full days of work for the agency. Breaking down the results for the other types of absences the ATT result always displays a negative sign except for the category 'other absences', with sick leave exhibiting a reduction of only 4 hours which corresponds to a little more than a half of an entire workday. The same pattern is shown for training absences and overtime work with an overall difference of one hour, that basically highlights how training hours or overtime are not affected by the program. The only significant result is the one concerning holiday absences. Employees participating in the flexitime program seem to reduce on average of an amount of 8 hours, more or less an entire day of work. For these subjects other absences instead seem to increase of 5 hours compared to the average in 2015. Similar to absences also the hours worked coefficient displays a negative sign indicating that people on average worked 5 hours less than 2015. However, even this result is not significant, which means that we can't really affirm that employees changed their behavior on the workplace.

One main issue at the end of this step of the analysis needs to be addressed in order to understand the possible reasons of these results and how the analysis can be perfectioned to get more specific results. Employees considered in this phase are only the ones who worked for the agency for four continuative years, which means that we did not consider all those who actually took part in the flexitime program, so that some relevant information might be missing. This choice, however, provides several advantages. First, it gives the chance to observe employees over a longer period, highlighting trends in behavior which might be useful for the agency. Second, we considered a four-year period in which employees did not enter in the program at the same time nor remained all for the same period of time. Our database contains people who entered in each of the years we analyzed, and few cases of people who left the program for one year and entered for a second time right after. This model doesn't allow to keep track of these particular cases, as for example the effects on employees who remained in the program for a greater amount of time might be different from the ones of employees who only participated in the program for of a single year. Because we have no information specific information concerning the experience of workers, by analyzing the behavior in four consecutive years without considering workers who are just hired or close to retirement, we can assume that workers are already accustomed with their tasks and don't plan to retire in the near future, elements which might affect absence management.

### 3.4.2 Model 2

The flexible conditional DiD model allows to match employees according to their entrance in the flexitime program and analyze absence hours one year after the entrance. Results of this model are described in Table 3.9, and balance tests in Table 3.10.

| Outcome | Mean differences | | ATT | A.I. robust S.E. | z | P> \| z \| |
|---|---|---|---|---|---|---|
| | Treated | Control | | | | |
| Total Absences | 3.5371 | -2.7437 | 6.2808 | 14.9906 | 0.4190 | 0.6754 |
| Sick leave | 1.3751 | 4.4601 | -3.0849 | 7.7036 | -0.4005 | 0.6890 |
| Holidays | 6.3501 | -1.2364 | 7.5865 | 3.5405 | 2.1428 | 0.0325** |
| Training | -0.6556 | 0.2276 | -0.8833 | 0.8382 | -1.0537 | 0.2924 |
| Other Absences | 5.3098 | 2.9259 | 2.3839 | 7.5342 | 0.3164 | 0.7518 |
| Hours worked | -9.4428 | -2.1454 | -7.2974 | 17.0073 | -0.4291 | 0.6680 |
| Overtime hours | 2.6639 | 6.0963 | -3.4324 | 1.7073 | -2.0104 | 0.0448** |
| Number of treated obs: 600 | | | | | | |
| Unmatched: 57 | | | | | | |
| Number of unique controls: 5106 | | | | | | |
| Mean number of matches: 473 | | | | | | |

Table 3.9: Changes in hours of employees present in each of the four years at t+1 using `flexpaneldid`. Note: $^{***}$ $p < 0.01$, $^{**}$ $p < 0.05$, $^{*}$ $p < 0.1$.

| Variable | Mean | | | t-test | |
|---|---|---|---|---|---|
| | Treated | Control | %bias | t | p> \| t \| |
| Age | 1.24 | 1.24 | 0.0 | 0.00 | 1.00 |
| Gender | 3.1717 | 3.1717 | 0.0 | -0.00 | 1.00 |
| Type of work | 1.3867 | 1.3867 | 0.0 | 0.00 | 1.00 |
| Residence | 1.9917 | 1.9917 | 0.0 | 0.00 | 1.00 |

Table 3.10: Balancing test using `flexpaneldid`

Total absences also in this case are not significantly affected by the participation to the flexitime program. Treated employees show a mean increase of 3.5 absence hours after entering the program, while in non-treated employees they slightly decrease ($-2.7$). However, the increase is not enough to determine a significant difference compared to employees who do not take part in the flexitime program. This result is not consistent with previous research finding positive impacts of flexible working arrangements on absenteeism, as an effect of higher autonomy and consequent lower stress of workers. The same trend can be observed

in holiday absences in the 'other absences' category. The average treatment effect on the treated (ATT) in terms of hours at year $t+1$ is 7.5 and it is statistically significant. It means that one year after entering the flexitime program, holiday absences of treated employees are 7.5 hours greater than that of non-treated employees net of the initial difference in absences between the two groups. In the 'other absences' case, employees seem to increase their absences if they have flexitime arrangements, but the difference is not significant, and in this case the increasing pattern is followed also by non-treated individuals.

We continue to check changes in other types of absences. We found no statistical reduction in sick leave, training hours or overall hours worked during the year. Training hours display a difference equal to $-0.8$, which means that the two groups have almost identical hours devoted to training, which is expected, considering that the program does not affect employees training plans. When considering sick leave, we notice that in $t+1$ it seems to be lower for the treated compared to the non-treated group, with a difference equal to $-3.08$. This means that people participating to the program generally display lower absences due to health problems, which is consistent with previous research claiming that flexibility reduces stress and therefore diminishes absenteeism, but our results are not significant to sustain this claim.

Also results concerning overall hours worked are not significant. Even though employees with flexitime arrangements work on average fewer hours than people with standard schedules the effects of the program are not remarkable. However, we found a significant impact of the program on overtime hours with an ATT equal to -3.4. Thus, we found evidence that employees who choose to enter the flexitime program work less overtime hours compared to workers who don't participate in the program, which might be considered a positive result for the agency, that will consequently reduce its costs, but might also indicate lower effort in the job[4].

[4]We checked for effects in specific gender and age target groups to identify possible particular groups of individuals driving the results of the overall population, but we were unable to find specific groups with particularly different results from others

## 3.5 Discussion

Flexible working arrangements have been proven influence public employees' decisions to attend work thanks to increased perceived autonomy (Edwards 2017). Moreover, previous studies have investigated the effects of flexibility on the workplace mainly by means of surveys filled with self-reported answers, but effects are rarely analyzed using performance measures in an experimental or quasi-experimental setting and longitudinal data (Kelly et al. 2008). The results of this study on a panel dataset of public employees after a more specific analysis seem to contradict previous research on the positive effects of flexibility on absenteeism rates. We found no clear evidence that after working with a flexible schedule, absences were significantly reduced compared to workers with standard schedules.

When analyzing the data using a Wilcoxon signed-rank test, and estimating the effects of the program calculating the ATT using propensity score and flexpaneldid, we obtained different significant results with each of the three methods used. However, by using the Wilcoxon signer-ranked test, we are not able to identify the exact difference in terms of hours, we only had an indication that the distribution of absences for new entrants was different from the distribution of the previous year. In the DiD model that uses propensity score instead, we obtained these results only observing absences in 2015 and comparing them to those of 2018 regardless of the moment in which employees started the program. It provides no specific information on how much time it might take for workers to adapt their behavior to the new schedule nor it considers the different starting points of the program for each person who decides to participate, increasing issues related to possible different environment conditions in the years considered in this study.

The limitations of the first two analyses were dealt with by analyzing matching employees at the time of their start of the program and checking their output results one year after participating for all, thus eliminating calendar time effects. The fact that employees have the possibility to enter the program each year makes it difficult not to consider the potential differences that might arise due to changing environment factors, which might explain the contrasting results when analyzing effects after three years without taking into account the different starting moments. Thus, in order to obtain more precise results, it was important to use a model which allowed to control for these factors. This led to the identification of

different effects, no more concerning the reduction in holiday hours, but on the contrary to an increase in holiday hours and the reduction in overtime work. An adjustment of the method used and a more specific consideration of the characteristics of the program, namely the possibility to enter and exit on a yearly basis, brought to an opposite result compared to the previous model. Therefore, we found no clear evidence supporting the JCT. While the reduction of overtime work implies a reduction of costs for employers, results on absenteeism rates indicate no impact of increased autonomy on job outputs and consequently on job satisfaction. The fact that no absence category was affected as expected from the use of flexible working hours suggests that there has to be in our analysis an unexplored link between flextime and absenteeism. Investigating this aspect would imply the introduction in the model of a variable detecting motivation, which, however, is not available. The literature suggests that motivation is affected by incentives, benefits and reward systems, and different levels and types of motivation might explain workers behavior in our setting. Since employees self-select themselves into the program there is the possibility that less motivated employees decide to enter in order to better adapt their work hours with their preferred activities. These workers, having lower intrinsic motivation and enjoying less their daily tasks, will seek an extra holiday whenever possible or when they most need it, thus explaining the higher holidays detected in our analysis. Moreover, these employees will be less inclined to answer employer's requests for an extra effort to complete assignments, consequently displaying lower levels of overtime work. These conclusions indicate that individual motivation is stronger than perceived autonomy in shaping employees' responses to benefits and that the misfit created between the flexibility tool and task demands might be the element preventing flexible working schedules from obtaining the positive work outputs predicted by the JCM.

**Managerial implications** This study suggests that although HRM practices such as the flexitime programs generally increase employees' satisfaction and work outputs by increasing perceived autonomy and lowering stress and work-family conflict levels, the simple use of these benefit plans does not grant a positive result. The effectiveness of flexible working arrangements also depend on personal motivation levels of individual workers and employers and managers should be able to strategically make use of flexibility tools in a way that can increase employees' performance. A substantial difference between the needs of employees

and task demands might otherwise turn benefit and work-family balance programs into ineffective tools that don't improve the performance of organizations. On the contrary, they might attract less motivated workers who might make use of these programs for their own interests.

Moreover, it may be useful to combine the analysis of output measures and other self-assessment tools such as surveys, in order to test the effectiveness of these programs both on employees and on organization performance measures and possibly improve their implementation.

## 3.6 Conclusion

This study contributes in understanding the effects of flexible working arrangements and in particular flexible working schedules on employees' output, focusing on the public sector, where monetary incentives or rewards are more difficult to design. The use of a panel dataset provides a different approach in assessing the results of increased flexibility compared to previous studies, which rely on surveys and self-reported answers (Kelly et al. 2008). By directly using employees' absences it is possible to observe the effective behavior of individuals in managing their time, instead of exploring behavior intentions. While at first data seem to confirm that increased flexibility has a positive impact on absenteeism, at a closer look the relationship is not as straightforward as predicted by the JCM (Hackman and Oldham 1980). The results of this study suggest that there may be other factors different from autonomy playing an important role in determining whether flexibility programs are effective or not. The positive effects of flexible working arrangements can be undermined by an imbalance between individual needs and task demands, which might lead less motivated employees to gain more flexibility to accommodate their needs, with potential loss of effort for the employer.

There are two main limitations to this study. The first regards the information in our dataset. Because of privacy reasons it was not possible to obtain detailed information regarding each worker. More accurate information might be able to detect different effects of the program. Second, the analysis conducted in this study only relies on output data provided by the health agency. In order to better understand possible motivation issues behind the results we obtained it would be useful to investigate using a more flexible tool

such as interviews. A combination of tools would have helped to gain a better insight in the dynamics among employees participating in the program, the reasons that lead them to enter, how they perceive the increased autonomy given by flexible working schedules, the way they manage their time, and the possible difficulties they face that can explain why the results we obtained are not consistent with the JCM. Further studies might combine an experimental or quasi experimental design with surveys in order to verify the consistency of results and gain a deeper understanding on the efficacy of flexible working arrangements.

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