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# AGE DISCRIMINATION IN THE LABOUR MARKET: A QUANTITATIVE ANALYSIS


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# Introduction

This dissertation addresses age discrimination of older workers in the labour market in Italy. It consists of three papers: one theoretical, which provides the state-of-the-art in this domain, and two empirical, with the first examining the role of policy in dealing with age discrimination and the second considering age discrimination experimentally through a laboratory experiment.

This is not the first study on discrimination. Indeed, various types and forms of discrimination (i.e., gender, ethnic or age) have been subject to serious scrutiny since the 1930s and 1950s in various disciplines, from psychology to sociology and economics to legal studies (e.g., Robinson, 1934; Ross, 1948; Allport, 1954 (1979); Becker, 1971; Phelps, 1972; Arrow, 1973, etc.). However, although it is persistent in many social and economic domains and in various cultures and has been intensively studied, discrimination escapes from clear-cut definitions and semantic boundaries. Not only disentangling discriminatory practices from non-discriminatory attitudes and behaviour is difficult; it also is hard to measure any possible empirical instance of these and considering only one particular theoretical or methodological approach is not sufficient to account for the subtle nuances of the phenomenon, which can even be context-specific.

The first chapter has tried to reconstruct these definitional problems. On the one hand, discrimination consists of any attitude, behavior or practice that implies to deny a person equal treatment due to the fact that he/she belongs to a certain group, without any reference to his/her own objective characteristics. Simple at a first glance, this definition gradually becomes more and more complicated the longer we consider it and try to apply it heuristically to understand the empirical reality. For instance, separating objective aspects (i.e., a given characteristic or quality of a person) from subjective motivations (i.e., based on stereotypical and/or prejudiced beliefs about a person as a member of a particular group) is very hard. Often, subjective motivations are difficult to reconstruct, while identifying the boundaries between penalties determined by social or economic inequality from 'real' discrimination leads to either overestimating or underestimating discrimination (Lucas, 2008, 2013).

There is also another, specifically, age-related factor that complicates the study of age discrimination specifically. While gender and race discrimination has been addressed by legislators and scholars since at least the past century, age discrimination has mostly received attention only after the retirement age has been increasing in most European countries and the USA, i.e., in the past three-four decades. Although some pioneering studies have been published already at the end of the 1970s (e.g., Haefner, 1977; Connor et al., 1978), this domain of research is relatively new.

Moreover, age is considered an exceptional case even according to the Council Directive 2000/78/EC of 27 November 2000 (Employment Equality Framework Directive), which was introduced by the European Parliament, where age discrimination, among other forms of discrimination in employment, is sanctioned. However, the law itself does not set strict boundaries on what is age discrimination and what is not. The clause 25 states:

> "The prohibition of age discrimination is an essential part of meeting the aims set out in the Employment Guidelines and encouraging diversity in the workforce. However, differences in treatment in connection with age may be justified under certain circumstances and therefore require specific provisions which may vary in accordance with the situation in Member States. It is therefore essential to distinguish between differences in treatment which are justified, in particular by legitimate employment policy, labour market and vocational training objectives, and discrimination which must be prohibited".

It is worth noting that the list of possible justifications is vague. For example, age, seniority and professional experience are considered similar when allowing for minimum required age, while fixing maximum age is allowed if it is based on some training requirements or "the need for a reasonable period of employment before retirement". Additionally, the differences in treatment are allowed if they serve to protect workers of certain ages.

Therefore, the law implies that if there is a legitimate, reasonable reason for unequal treatment of people of different ages, this treatment is not discriminatory. In principle, this makes sense as differences in ages mostly mean differences in experience, education, physical abilities and health status. However, it must be noted that "objectivity" here relates more preferably to younger ages. Indeed, it is literally impossible to have 20 years of experience at 25, but it is possible to be physically fit at 50 even if age increases the probability of having some diseases, provided that a person leads a healthy life. Furthermore, considering younger people, research often attributes unequal treatment to different economic cycles or the education-job market mismatch without any discriminatory reasons (e.g. Barbulescu, 2012; Refrigeri, Aleandri, 2013; Gontkovičová, Mihalčová, Pružinský, 2015).

However, understanding the mechanisms behind stereotypes that prevent employers to evaluate older people objectively is more difficult. Considering older workers less motivated, less healthy, less prompt to learn new methods and dealing with new technologies is typical (e.g., Riach & Rich, 2007). All these stereotypes result in discrimination as a person's characteristic is simply transposed from the simple fact that he/she is considered as a group member, merely due to categorization rather than concrete individual characteristics.

Therefore, the reasons behind younger people's high risks of unemployment are more often than not connected to the reasons not related to discrimination.

On the other hand, the situation of older people is less clear, with subjective and objective dimensions often conflated to the detriment of understanding (Wood et al., 2008). This makes almost impossible to distinguish between discrimination and justified unequal treatment, especially because research about older people's abilities and their link to productivity did not produce consensual findings (e.g., Fyock, 1991; Warr, 1994; Chaparro et al, 1999; Kang, Yoon, 2008; Zancada-Menendez et al, 2015, etc.).

However, this is one of the most important aspects when studying potentially discriminative outcomes, actions and settings. Finding out the grounds for unequal treatment is key to understand discrimination.

The rest of the dissertation is organized as follows.

In the first chapter, we provided an overview on discrimination in general and age discrimination specifically, delving into the history of this research and its current state. We also considered methodological issues and approaches which could enlarge and enrich research in this domain.

Among other things, in the first chapter, we have provided an overview of the literature about possible theories behind older workers being discriminated in the labour market. After analyzing them we infer that there are two main reasons behind specifically discriminatory decisions against older workers made by employers (Wood et al., 2008). First, these are cultural norms that favour "young" over "old" which can be considered as instances of the tastes-based discrimination defined by Becker (Becker, 1971). Secondly, labour market is conditioned by imperfect information, which leads employers to rely on stereotypes about older workers. This is what economists would define as "statistical discrimination" (e.g., Phelps, 1972; Arrow, 1973).

Beside these two theories, Wood and colleagues (2008) examine various others that could stand behind unfavourable treatment of older workers compared to younger ones such as older workers intentionally not undergoing necessary additional training or firms in the periods of crisis letting go workers who are closer to retirement. However, most of those theories, that are addressed in chapter one in detail, depend a lot on the circumstances behind the actions. It is almost impossible to understand whether the actions were discriminatory without digging into the reasoning the preceded the actions, be they objective or subjective. The workers could have decided themselves that they hold no interest in undergoing training that would allow them to gain up-to-date knowledge in their field or they could have been denied access to training by their employers due to their beliefs that workers will not be able to keep up with new methods because they are too

old. In the period of crisis employer could have made an older worker redundant because he/she assumed that an older worker is less motivated than a younger worker and will retire anyway in a couple of years or he/she could have made that decision because an older worker was less productive than a younger worker. The reasoning here decides everything.

Therefore, examining discrimination without considering reasoning and motivations often has little sense. Absence of an up-to-date training and health problems have constructive implications while stereotypes, cultural norms and beliefs a lot less so. The mechanisms determining unequal treatment are also key, as they are instrumental for policies. Employment problems of older workers that are linked to their health issues and/or lower competency levels require different policy measures compared to the employment problems that arise from simple discriminative behaviour from the side of employers.

Another important point that we raised in the first chapter is methodological. There is a limited number of approaches towards discrimination in the labour market: analysis of the outcomes, surveys of the employers and workers, field and laboratory experiments (Keuschnigg and Wolbring, 2015) that, obviously, have their strengths and weaknesses and, ideally, all of them should be used to get a full picture about discrimination, as separately they do not represent it. Thus, in our research, we made an attempt to look at the discrimination issue from different angles.

In the second chapter, we analyzed the role and effect of policies in fighting discrimination, with a particular interest in the introduction of the Employment Equality Framework Directive in Italy. Although previous research suggested that policies are not sufficient to eradicate discrimination, analyzing these aspects is instrumental to understand how the concept is socially constructed (Krings, Sczesny, Kluge, 2011). Even though research about age discrimination in the labour market in Italy is scarce, there is certain evidence about discrimination of older workers (Segalla, Jacobs-Belschak, Muller, 2001; Rymkevitch, Villosio, 2007; Lazazzara, Bombelli, 2011). According to some researchers, this problem is currently being solved only by the increase in retirement age, which is what many governments are doing, and which is not necessarily the best decision (Guaglianone, Ravelli, 2017). Indeed, retirement age increase does not automatically lead to an increase of older people's employment. It may also lead to an increase of unemployment among older groups if other anti-discriminatory measures are not undertaken at the same time. Therefore, in the chapter two, we analyzed the influence of the introduction of the anti-discriminatory legislation in 2003 on the employment rate of the older cohort (55-59 y.o.) compared to a control group of younger workers (35-39 y.o.) by using the difference-in-difference method of analysis on the European Union Labour Force Survey (EU LFS) data.

In the third chapter, we presented a laboratory experiment on labour market discrimination. We concentrated on the actual existence of age discrimination in hiring towards older workers by presenting various vacancies and CVs to participants (students) and asking them to choose between older and younger candidates, who also varied in terms of gender, experience and additional training. Our design was intended to help us disentangling objective (experience, training) and subjective factors (stereotypes, social influence), while considering also certain recruiters' personal characteristics (i.e., gender, age, family situation). Our ambition was to distinguish between objective, rational, non-discriminatory decisions; pure discriminatory decisions ("tastes-based") and statistical discrimination. This is why we asked participants additional questions about their attitudes towards older workers and older people in general. Here, the laboratory experimental setting was instrumental to obtain objective information about the current situation, while permitting us to remove additional unobservable factors as our best.

In the conclusion of this dissertation, we summarized our results, discussed changing trends in discrimination and certain factors influencing it. We considered mechanisms behind discriminatory actions, the best fitting theories and possible measures that could lead to the decrease of discrimination. We addressed the benefits and limitations of this research, and, finally, ways in which it could be further developed and enriched.

# Chapter 1. Literature review[1]

## Introduction

The aim of this chapter is to discuss the concept of discrimination. Attention will be paid to reconstructing the most relevant approaches in order to provide the state-of-the-art in this domain, with a special emphasis on age discrimination in the labour market. We will start with discussion of concepts and types of discrimination in general to turn then to a more specific type of discrimination — age discrimination. It is important to note that this type of discrimination has attracted a lot of attention considering the current trends in ageing population in all contemporary societies, with dramatic socio-economic implications. However, the amount of literature compared to literature on other forms of discrimination is relatively scarce.

## 1. The concept and definition of discrimination

Everyone knows what discrimination is from his or her personal experience. The notion may seem obvious and self-explanatory without further ado. Even if we do not feel victims of discrimination and/or do not consider ourselves capable of discriminating other people, we usually read newspapers and journals or see social media campaigns which show public movements or civil protests aimed to provide equal rights to certain groups, who are deprived of these by someone else. Everything seems clear and obvious. We may agree or disagree about the existence and extent of discrimination, but, probably, we will have no doubt saying that we are very well aware of the existence of this phenomenon and of what it means.

However, it had not always been the case.

Social stratification that exists to a certain extent in all societies is the division of the society in groups that differ by wealth, social status and power (e.g., Parsons, 1940; Davis, 1942). Social inequality comes as a result of this division. Division in groups, per se, can be considered normal and natural for a society (Davis, Moore, 1944). Certain level of inequality is even looked at as a positive thing by some researchers as it may stimulate people to invest in themselves and work harder to improve their position on the social ladder (Grusky, Manwai, 2008).

However, this division in groups is not always just and, thus, social inequality is also not necessarily just. It can, obviously, arise from individuals' personal qualities and abilities (Durkheim, 1892; Davis, Moore, 1944) but no less often from other factors that do not depend

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on any individual characteristics, including discrimination based on persons' belonging to specific groups (Lucas, 2008).

This attitude towards certain group characteristics is a societal thing, historically developed. These characteristics, be it gender or skin colour, are only important to the extent that society considers them important (Grusky, Manwai, 2008). The more important they are, the higher is the level of discrimination. In the past, this group approach was considered completely natural, societies were based on them. Nowadays, we are trying to move away from them, knowing that, according to recent studies higher levels of equality are better for economic growth and for the societies as a whole (Grusky, Manwai, 2008). Higher levels of equality, lower levels of discrimination benefit not only unfavoured groups but also those who do not belong to them (Lucas, 2008).

However, inequality that arises from objective individual factors and inequality that comes from discrimination are two different things that are not always easy to disentangle.

In order to understand the phenomenon of discrimination better, we will first look at its concept and origins in more detail.

We can start by giving the term a rather broad, general, dictionary definition, just to set certain wide boundaries for this review. Thus, according to Cambridge dictionary, discrimination means,

> "treating a person or particular group of people differently, especially in a worse way from the way in which you treat other people, because of their skin colour, sex, sexuality, etc.".

Oxford dictionary says that it is

> "the unjust or prejudicial treatment of different categories of people, especially on the grounds of race, age, or sex".

We will, through the course of this chapter, address other earlier and later definitions and related concepts. However, we believe that these definitions allow us to understand that if a person is *denied equal treatment* with other people *only* because he/she belongs to a certain group or groups and *not* because of objective facts regarding *this person specifically*, well, in these cases, we can surely say he/she is being discriminated.

Nowadays, in most places and societies the existence of discrimination is considered common knowledge. Most people, in theory at least, have been exposed either directly or indirectly to certain discriminative actions and know that this leads the victims to negative consequences, which is something incorrect and unjust. The existence of various anti-

discriminatory laws, regular publications and discussions in blogs and on social media, social advertising and social experiments does not permit people to forget or ignore it and helps everyone to remember.

Nevertheless, evidence indicates that discrimination is still persistent (see in detail below). This is because distinguishing discrimination from other actions based on well-founded, valid, objective reasons as well as understanding the subjective reasoning of discriminators behind their actions is considerably more complicated (Kalisch, Williams, 1983).

Probably, this is also because discrimination on closer inspection remains a relatively young field of research. On the one hand, evidence suggests that it has existed since long ago. In history, signs of discriminatory behavior can be found as early as the fifth century B.C. (Isaac, 2006, p.2) among ancient Greeks and Romans. They were proponents of environmental theory which assumed that physical environment influenced and even determined group characteristics. Moreover, they believed that these characteristics were passed on to the next generations and stayed unchanged over time. While these theories cannot be viewed as contemporary racism is viewed (indeed, Isaac himself talks about proto-racism and ethnic prejudice), they served to justify categorization of people into inferior, equal and superior, and the roots of contemporary racial and ethnic discrimination come from those, very early, periods (Isaac, 2006, p. 1; p. 55-56). Similarly, we can talk about Christians being oppressed in the third century, i.e. discriminated if put in today's words, and with scales shifting in the next century in their favour and against the pagans (Arjava, 1996, p. 3). Women in the Late antiquity in Roman society had considerably fewer rights and free will than men, be it marriage decisions or property rights. Moreover, even though Roman laws in general were gender neutral and, as Arjava states, women's position in the Roman society was rather strong in comparison with other historical societies, their role was limited to the family and they did not seem to have any independent role outside of it (Arjava, 1996, Chapter 7). Finally, while old age was often favoured in antiquity, even regarding this group there can be found signs of prejudice and discrimination as there were two extreme attitudes:

> "that old people have a definite role to play and contribution to make; and that old people are an unwelcome burden and at best must be tolerated" (Johnson, Thane, 1998, p. 34).

Therefore, we can see that unequal and unjust treatment of certain groups is a very old phenomenon.

On the other hand, the first official definition of discrimination is attributed by Oxford dictionaries only to the early 17th century (English Oxford living dictionaries, 2018). Certain

laws and acts aiming at providing some sort of equal treatment and equal rights to different groups of society can be found in earlier periods in history (e.g., Statute of Kalisz, 1264; Edict of Nantes, 1598). However, first systematic analyses are found not earlier than in the 1920s and 1930s and they mostly concerned market power side, i.e., strictly economics-based side of discrimination (Robinson, 1934; Ross, 1948; Kessel, 1958), and prejudice/stereotypes (Schneider, 2005, pp. 8-9). Later on, research explored various angles, with a particular attention to racial discrimination since the 1950s and especially the 1970s (Becker, 1971; Phelps, 1972; Arrow, 1973; Aigner, Cain, 1977; Allport, 1954 (1979).

However, it is relatively clear that discrimination as a recognized issue is only about a century old. Certain theoretical and methodological approaches trace back to about 50-70 years old. This can explain why research did not yet clearly distinguish discrimination from inequality, for instance, or did not develop robust methods to measure it.

# 2. The origins, process, types and consequences of discrimination

## 2.1 Stereotypes, prejudice and discrimination

Discrimination has negative economic, social and psychological consequences either individually or collectively. It penalizes certain individuals to benefit other ones either objectively or subjectively. When a person discriminates another one due to his/her age, ethnicity or gender, not only is he/she reducing the likelihood that this person accesses relevant material or symbolic resources (money, a job, respect and self-esteem); he/she also can benefit from keeping these resources for him/herself or for a member of his/her group. These advantages and the competitive power related to them can explain why discrimination did not cease to exist. For a long time, stereotypes, both arising from subjective and objective thinking, have been considered a reason behind prejudice and, thus, behind discriminatory behavior.

According to Schneider (2005),

> "stereotypes are qualities perceived to be associated with particular groups or categories of people" (Schneider, 2005, p. 24).

Stereotypes follow people's natural tendency of categorizing what they see, do, know and experience. Hence, dividing everything into groups and categories, including themselves and people around them, is natural. Note that many categorizations and even stereotypes arising are a necessity for humans. They make life easier, help avoid uncertainty and use experience to personal advantage. Therefore, stereotypes are not a bad thing *per se*. They are bad when

negative, far from the truth and hurting vulnerable people either directly or indirectly (Schneider, 2005, Chapter 15).

Furthermore, the relationship between stereotypes, prejudice and discrimination is not exactly straightforward. Many of the first studies in psychology and social psychology considered discrimination as a form of prejudice (e.g., Allport, 1954 (1979), Frederickson, Knobel, 1980, etc.). This is followed even by recent authors (Fishbein, 2002, who covers most of the publication on prejudice written before him; Nelson, 2009, Brown, 2010; etc.).

In his seminal work Allport wrote that prejudice is

> "an aversive or hostile attitude toward a person who belongs to a group, simply because he belongs to that group, and is therefore presumed to have the objectionable qualities ascribed to the group" (Allport, 1979, p.7).

He also argued that

> "the net effect of prejudice (…) is to place the object of prejudice at some disadvantage not merited by his own misconduct" (Allport, 1979, p.9).

In this respect, Fishbein provided another definition:

> "Prejudice is an unreasonable negative attitude toward others because of their membership in a particular group" (Fishbein, 2002, pp. 4-5).

It can be noted that these definitions have in common the idea that *prejudice is unreasonable and not based on any objective facts*. However, Brown (2010) disagreed with the part of definition about prejudice being regarded only as unreasonable, as

> "a 'false' or 'irrational' set of beliefs, a 'faulty' generalization, or as an 'unwarranted' disposition to behave negatively towards another group" (Brown, 2010, p. 5).

Firstly, according to Brown, such an approach means that there is a way to prove incorrectness of prejudiced ideas which is not necessarily the case. He presented an example of landlords' prejudice against black tenants who are "likely to create problems". Brown claimed that even if it was possible to devise some normative standard of "peacefulness" and compare people to it, there would still be many possible explanations for this predisposition to blacks "creating problems" (provocations by white people, reaction to unfair social deprivation, etc.)

that are not connected to black people's nature. Thus, as Brown stated, even if the landlords' beliefs did have some alleged proof from reality, it would make their attitudes no less prejudiced.

Prejudice may have warranty, especially in the eyes of those who are prejudiced, and, in this sense, will be reasonable from their point of view.

Prejudice typically exists towards members belonging to specific groups and usually has a negative flavour, although some researchers mentioned even cases of positive prejudice (Brown, 2010, p. 4-5; Allport, 1979, p. 6). For instance, Allport suggested that prejudice can also be positive in situations when people are

> "prejudiced in favor of others; they may think well of them without sufficient warrant" (Allport, 1979, p. 6).

However, in general, researchers are concerned with the negative side of prejudice that is usually studied as this side of the phenomenon has serious and negative consequences for the society, and this prejudice often arises from negative stereotypes.

Nevertheless, it is not as obvious. For example, as Brown (2010) stated, presenting himself as an example, he is very favourable towards everything Italian (food, cinema, language, etc.) but that this kind of preference is highly unlikely to create any serious social problems. Nevertheless, there are instances in which positive bias towards certain groups can lead to these groups staying in subordinate position. Brown cited examples from previous research. In North America, people tended to have more positive stereotypes about women than about men

> ("men are incomplete without women'; 'women, compared to men, tend to have a superior moral sensibility'; or 'a good woman should be set on a pedestal by her man" (Brown, 2010, p.6))

but these stereotypes exactly served to defining women as dependent on men and people with such views were also more prone to defending sexist notions. Thus, even positive prejudice could (indirectly) result in societal problems and create social inequality.

Therefore, agreeing with Brown, to our opinion, a more complete definition of prejudice would be:

> "any attitude, emotion or behaviour towards members of a group, which directly or indirectly implies some negativity or antipathy towards that group" (Brown, 2010, p.7).

Considering the place of discrimination here, we can state that this should be an action resulting from prejudiced attitudes. As Allport (1979) indicated, prejudice does not necessarily equal discrimination. It only turns into discrimination when people start acting in accordance with their personal misconceptions about certain groups. In his theory, discrimination is formed in five steps. The first step is people talking about their prejudices (antilocution). A lot of people do not go beyond it. The second step takes place when people start to avoid those who they are prejudiced against (avoidance). At this stage they do not do any direct harm themselves. The third step he named is, actually, discrimination. This is when active steps are being taken to remove, exclude, members of certain groups, for example, from employment, education or social privileges. Next stage is physical violence against members of this groups. The final step is extermination — the highest degree of expressing prejudice.

To summarize Allport's attitude towards discrimination we can cite his words:

> "Discrimination comes about only when we deny to individuals or groups of people equality of treatment which they may wish." (Allport, 1979, p. 51).

This would suggest that while prejudice is more or less a feeling, an opinion, an attitude, discrimination is an action following such feelings, opinions and attitudes and being the consequence of them.

According, for example, to Frederickson and Knobel:

> "Discrimination may appear to be simply acting out of prior prejudice, but there is evidence to suggest that prejudice becomes fully developed and formally sanctioned only after the process of differential treatment is well under way. Attitude and action tend to feed on each other, creating a vicious circle that works to enhance the power and prestige of one group at the expense of the other" (Frederickson, Knobel, 1980, p. 31).

Additionally, as Allport correctly argued,

> "few people keep their antipathies entirely to themselves" (Allport, 1979, p. 14).

Therefore, prejudiced people very often discriminate in one way or another against groups of people they dislike. Consequently, prejudice becomes stronger and the same happens to discrimination.

It should also be mentioned that prejudice and stereotypes are not fixed. They change with environment, time and circumstances. And it is hard to predict how the stereotype (and prejudiced attitudes with it) would evolve if one person belonged to two different groups against which another person had contradicting stereotypes (i.e., he/she is negatively prejudiced against one group and positively prejudiced against another group) (Schneider, 2005, p. 269). Furthermore, recent research suggests that certain negative stereotypes can lead to positive consequences and absence of discrimination, such as gay black men not being discriminated contrary to black men in general because in this case the stereotypes of gays being effeminate would override the stereotypes of black people being aggressive and dangerous and play in favor of the applicant in the labour market (Pedulla, 2014, p. 75). Still, these are very specific cases that do not overturn the whole story about the destructive role of prejudice and stereotypes in people's lives.

Lucas (2008) when addressing the phenomenon of discrimination, adopted an approach that differed slightly from the ones that we have presented above. He claimed that the third step that Allport named discrimination is not actually discrimination but one part of it — exclusion. He also claimed that Allport himself defined discrimination as an action but that, in this sense, antilocution (the first step) is not just an attitude but an action in itself. Thus, he argued that the whole five-step-process presented by Allport (from feeling and voicing prejudice to extermination) described different forms and stages of discrimination.

Following Lucas' reasoning, here we will adopt his definition of discrimination which is very close to the one given by Allport:

> "discrimination entails distinction made on grounds of natural or social categories, which have no relation either to individual capacities or merits, or to the concrete behavior of the individual person, but is, instead, based in a limiting view of some types of persons" (Lucas, 2008, p.179).

Here, we should also address the fact that stereotypes, prejudice and discrimination rarely happen on individual level only (although this is the level at which they are usually studied, and we will look at this this further in the text). In general, it is a group phenomenon. According to Allport's (1979) theory of in-groups and out-groups, people get used to belong to homogeneous groups, to their own kind and often do not feel the need to communicate with other groups, outside the circle of people that they are used to. They do face people from the out-groups in occupational situation but often do not go in the communication beyond the work environment. This concerns both minority and majority groups, and the minorities do not always remain separate due to the action of the majority groups. It is not a rare case when the minority groups choose to remain among their kind. This, obviously, creates the environment for the members of

one group not to have enough information about the members of other groups. They may overestimate the level of differences between them and other groups and form understanding of other groups based on this limited information. This, in turn, leads to the creation of stereotypes.

Moreover, as we have already briefly mentioned above, categorizations and generalizations follow people through all their lives.

People are taught generalizations in schools and by their parents (and for the good cause as well), they learn from their culture, they consider themselves to belong to certain groups themselves (by birth and/or by personal choices). And this brings us to the issue of identification and even self-identification. Each and every person grows up in some kind of a culture starting from the cultural norms inside his/her family and finishing with the cultural and legal norms of the country he/she grew up in. Every person learns to identify himself/herself with those norms, what is right or wrong, good or bad, legal or illegal. And he/she, definitely, adds personal experience to it forming generalizations of their own (Schneider, 2005, Chapter 1). Which kind of influence is stronger will depend on the circumstances.

In any case, it could be said that due to the circumstances of his/her upbringing and/or due to personal experience a person decides to consider himself/herself belonging to one or several groups and often tends to be at least cautious around those who he/she thinks to belong to other groups. His/her caution may be the result of previous experience or of ignorance, either way he/she is sure that another person is somehow different — and in a negative way. The "type" of this difference varies with time and circumstances. In the distant past discrimination was often based on religion (Allport, 1979, p. xvii); in the twentieth century, we would have probably named race and gender as the main reasons for discrimination — or, at least, as the most obvious ones; today, we can expect all these kinds of discrimination together with the new ones, such as discrimination based on sexual orientation and gender identification.

To summarize all that was discussed above, we can say that discrimination originates from the people's tendency to categorize everything and everyone around them. While it makes life simpler and less uncertain, it also leads to people being cautious towards things and people that they consider different from themselves. Those categorizations may be based on cultural norms and/or personal experiences. Either way it is easy to put a person in a specific category based on his/her race, gender, age, etc. and assume that all member belonging to this group have certain traits. When negative traits are assumed, it is the first step towards discrimination as a stereotypes and prejudice are being formed. Then, depending on the severity of negative attitude discriminatory behavior may vary from simple avoidance to exclusion and even to extermination. As a consequence, discriminated groups face various issues including psychological problems, lower grades at school, worse career and life opportunities in general,

face higher unemployment risks and issues. All this, in turn leads to lower quality of life than that of people who do not belong to discriminated groups that we will discuss in more detail further on.

## 2.2 Types of discrimination

When trying to distinguish between different types of discrimination, research tends to highlight two main ones.

The first type is the one on which Becker has built his theory of discrimination, saying that

> "if someone has a taste for discrimination, he must act as if he were willing to forfeit income to avoid certain transactions" (Becker, 1971, p. 14)

and that in the foundation of this approach lie ignorance and prejudice. This type of discrimination is usually called tastes-based or prejudice-based discrimination.

The advocates of the opposite theory (Phelps, 1972; Arrow, 1973; Aigner, Cain, 1977) took a different approach. According to them, it is not about likes and dislikes based on prejudiced perceptions, but rather about not tastes-related decisions based on different logic of thinking. They claimed that the employers who could not observe the real abilities of their potential employees would use ethnic, age or other characteristic as proxies for these abilities. They will take average productivity of the group to make decisions. Sometimes real statistics, sometimes stereotypical views based on personal experiences and experiences of other people will be used. In both cases, the person who does not fit the average or the stereotype (and a lot of people would not) would be the victim of discrimination.

In case of the first theory the person is ready to accept a decreased income just to avoid coming in contact with someone who he/she does not like (e.g., not hire an objectively good candidate just because it is a woman instead of a man, or a black person instead of a white one; deny a person booking of a hotel room based only on his or her nationality-specific surname even though there are rooms available just because of a specific dislike of people of this specific nation, etc.). In case of a second one, the person does the opposite: for example, he does not make a woman a job offer not because he/she does not like women but because he/she knows for a fact that women take more leaves of absence to stay with sick children than men and that her frequent absences will disrupt his/her business and lead to income loss. True, this person cannot know how this specific woman will act but he/she does not hire her just in case.

However, in retrospective both tastes-based and statistical discrimination are a result of stereotypical beliefs and prejudice which role we have discussed in the previous section of this

chapter. It is just that in the first case the person who discriminates is prepared to lose something while in the second one this person expects to gain something or, at least, to avoid objective losses. Still, in both cases we have some kind of a stereotype about a group to which the discriminated person belongs and a prejudiced attitude against him/her based on this stereotype.

Apart from the main, underlying, types of discrimination, there were other attempts to distinguish among such types as market power discrimination; discrimination coming from institutional, social or legal constraints (both specified in Feltovich, Papageorgiou, 2004); intentional, explicit discrimination (verbal antagonism, avoidance, segregation, physical attacks and extermination); subtle, unconscious, automatic discrimination; discrimination resulting from organizational processes (rules of providing loans and mortgages; selling and renting houses; employing new employees, while not discriminating anyone formally, still result in some groups being put at a disadvantage) (all presented in Blank, Dabady, Citro, 2004).

Lucas (2008) discussed the criticism of the two main approaches to classify discrimination.

According to him, Becker's theory is hard to generalize to other spheres aside from the economic one. It also fails to distinguish between positive and negative discrimination, i.e. Becker in his theory assumes that the wage gaps between discriminated and non-discriminated groups are due to the employer willing to compensate for his/her displeasure of hiring workers who he/she dislikes. However, this could also work the other way around: the wage of someone may be higher because the employer likes him/her more than he/she likes other workers. Similarly, Becker's theory in unable to distinguish between discrimination and differences that arise from other reasons. As Lucas put it, with Becker's theory it is impossible to see the difference between marriage and employment discrimination. When marrying someone, the person makes a choice based on tastes, they may be forfeiting some income (e.g., if they are choosing a less wealthy person) and they may be decreasing the quality of life of the person they are not choosing. The same thing happens in employment discrimination situation.

Statistical discrimination, on the other hand, according to Lucas, also has problems. He claimed that, if employers hold incorrect information about the abilities of workers, then these attitudes should be corrected over time when the employer gets to observe real abilities. If this does not happen, it means that other factors influence the position of discriminated groups that the theory does not consider. If this is not the case, it may mean that incorrect attitudes of employers come as a result of the limits of information that they have access to. However, in this case, Lucas says, it means that employers are prepared to accept the unreliable sources of information or unreliable indicators of the productivity of discriminated groups. This would mean that they have some views about these groups that allow them to keep these unreliable

indicators. This, in turn, would mean that issues are more complicated than notions of statistical discrimination assume. Finally, the decisions made under the concept of statistical discrimination could happen due to employers being risk-averse. In this case, Lucas claimed, these are not discriminatory issues. This, last, point, to our opinion, is debatable. While an employer may decide not to hire a person whose abilities he/she cannot evaluate on the spot in an attempt to avoid risks, this will still, *de facto*, be a discriminative action. This decision will be made because the employer will hold a stereotype about the group to which this potential employee belongs. This discrimination just will not be a *conscious, planned* discrimination based on a personal dislike or preference.

Proponents of both theories in their research concentrated mainly on the labour market and other economic situations which are, obviously, not the only domains where discrimination can be found (see below). We have also established that adapting them (especially Becker's theory) to other domains may be hard. However, as this research concentrates on discrimination in the labour market, this cannot be the reason for us not to base our research on these types of discrimination.

We also agree with most of other critics addressing these two types of discrimination. Nevertheless, to our view, they represent two different, practically opposite, attitudes through which a person as an individual and/or a person as part of a group can be discriminative against a person belonging to another group. Becker's tastes-based discrimination addresses more conscious side of discrimination. Statistical discrimination, being based on statistical information, and, thus, even considered by Lucas as not-discrimination, to our view remains discrimination as members of those groups who do not hold qualities attributed to them will still suffer from unfair treatment. To make our reasoning clearer: only women can get pregnant and give birth. However, basing employment decisions on this notion and assuming that this particular woman of fertile age will make a choice to have a baby and leave employment soon would be discriminative. Moreover, physical abilities and health do tend to deteriorate with age. However, using age as an only factor to determine whether a potential employee will be able to perform tasks that require certain level of physical fitness will be discriminatory as from age alone it is impossible to say whether the persons keeps himself/herself in good shape. To our opinion, both these examples fall in line with statistical discrimination.

Thus, although understanding that these two definitions have their limits and are unable to provide for all details behind discriminatory action, we, however, will be using them as a means of distinguishing between baseline motives that could lie at the heart of discrimination. We will address the importance of these motivations further in the text.

We understand that it is difficult to distinguish between different types of discrimination, mainly, because the subtle differences in reasoning that separates one from the other are often difficult to "catch", especially with the existing methods of research that we analyze in the next sections of this chapter and with the current attitude in the world towards discrimination from the legal point of view.

Even with a simple personal dislike of a certain group of people a person can find an objective explanation for his/her discriminatory decisions, especially as today mostly everyone knows that, in general, being an openly discriminating person is bad for reputation and — due to the existence of anti-discriminatory laws — bad for business. Consequently, those people, even if they do discriminate on the basis of tastes, would look for valid, socially acceptable explanations of their actions. Probably, it is not surprising that most papers do not go into distinguishing between tastes-based and statistical discrimination, as it is so difficult to do exactly that — find out what lies behind discriminatory actions and why.

Still, in the end, all forms of discrimination arise from prejudice, stereotypes, statistics or previous experience (which, in turn, also come to stereotypes) — or at least to market research that allows for generalizations leading in return, for example, to price discrimination in the market. In the end, all these types of discrimination are linked to either statistical or tastes-based discrimination. For example, rules on loans of mortgages are based on the average statistical information about certain groups of people and market power discrimination on the average type of consumer, even if it is apparent that some individuals act differently.

Thus, we have two focal types of discrimination both closely linked to stereotypes and prejudice. We will now move to the next section to discuss the levels at which discrimination can take place: micro and macro.

## 2.3 Two levels of discrimination

There are two main levels at which discrimination may take place: micro and macro. Mainly the researchers take the micro-level approach, i.e. studying individual's actions towards other individuals, even if those individuals consider themselves and their counterparts to belong to certain groups. Almost every research approach to discrimination (surveys, experiments, secondary data analysis (Keuschnigg and Wolbring (2015))) is a micro-level one. And it is true that discrimination is often understood as a micro level phenomenon. It even comes from its definition about a person being denied equality because of belonging to a certain group.

However, macro-level of discrimination which happens on the level of the society as a whole, the level on which legislations and policies that influence the level of discrimination are introduced, the level at which norms and beliefs are often engrained is no less important. Consequences of discrimination, even if these are individuals who perform discriminatory

actions, have an encompassing effect on everyone in the society. This is a large-scale approach that looks not at individuals or small groups but at big groups, countries, states or societies as a whole, on an aggregate level. This approach, however, is not very popular in the studies of discrimination. For example, research that concerns laws focuses on the contents of laws and analyzes the content of those laws or specific cases rather than the quantitative data and a more in-depth analysis of the direct connection of changes to the introduction of new anti-discriminatory laws (e.g., Sargeant, 2004; McColgan, 2005; Fredman, 2011; Ellis, Watson, 2012; Sargeant, 2013; Corbin, Duvall, 2015; Khaitan; 2015).

The proof of discrimination's all-encompassing role in the society is that its existence is found almost everywhere. Let us present some example about different discriminatory settings and different discriminated groups.

In USA, research shows high levels of perceived discrimination in educational settings due to racial bias both in academic sense and in peer activities (Fisher, Wallace, Fenton, 2000; Benner, Graham, 2013; Benner, Wang, 2017). In developing countries, such as Pakistan (Ara, Malik, 2012), India (Nagaraja, Reddy, Shankar, 2013), Bangladesh or Malawi (Khan et al., 2016), females face more obstacles than males in getting access to education.

In health care in USA, patients from racial and ethnic minorities suffer both from statistical discrimination (they tend to get worse treatment compared to white patients due to communication problems with physicians who, as a result, understand the health status of these patients worse and are likely to mismatch them with the treatments (Balsa, McCuire, 2001)) and perceived discrimination (Hausmann et al., 2008). Patients with mental illness often fall victims of negative attitude from medical staff and "diagnostic overshadowing", i.e. when their physical symptoms are wrongly attributed to their mental illness problems (Thornicroft, Rose, Kassam, 2007). Kydd and Fleming (2015) present an in-depth analysis on age discrimination and ageism against older adults aged between 50 and 85.

In the USA, disabled people, in particular, those with learning difficulties face discrimination and can end up wrongfully accused of crimes (Chappell, 1994). The same thing happens to people from racial minorities (Weitzer, 1996).

Research based on the firm-level data from 28 transitional European countries showed support for the hypothesis of the bias against female-led businesses in what concerned the probability of credit denials as the differences in decisions made could not be explained by observable characteristics of the firms (Aristei, Gallo, 2016). Similar issues were reported by self-employed non-European immigrants in Sweden (Aldén, Hammarstedt, 2016), as well as for loan applicants belonging to racial and ethnics minorities in the USA (Cavalluzzo, Cavalluzzo, 1998).

Ethnic and racial discrimination is also persistent in consumer and housing markets in USA (Yinger, 1998; Ahmed, Hammarstedt, 2008; Gaddis, Ghoshal, 2015) and in Spain (Bosch, Carnero, Farré, 2015) as field experiments show.

In the labour market of France, an extensive study of 2228 branches of companies showed a significant level of discrimination against applicants with physical disabilities. The same happens to the disabled in the UK, in spite of the introduction of 1996 Disability Discrimination Act in Britain which, at best, had no impact on their employment rate and, at worse, could have even decreased it (Bell, Heitmueller, 2009). Women still face considerable workplace discrimination in the USA (Gregory, 2003). Field experiment showed ethnic discrimination in the labour market (both in terms of wage levels and hiring) of Greece (Drydakis, Vlassis, 2010; Drydakis, 2012). Ozeren's (2014) literature review of the papers concerning sexual orientation discrimination in the workplace pointed to the existence of the problems in terms of, for example, lower wages even if their situation differed across countries. The meta-analysis of field research on ethnic discrimination in hiring in OECD countries for the period 1990-2015 showed that this kind of discrimination is commonplace (Zschirnt, Ruedin, 2015). There are various examples in different countries of age discrimination proved by field research that we will discuss later in more detail (e.g., Riach, 2015).

These are only a few examples of different types of discrimination in different discriminative setting in different countries assessed with different methods (for discussion of the methodology, see below) to show the place that discrimination has in life of many people.

The consequences from this all-encompassing discrimination phenomenon can psychological, physiological, sociological and economic. The first three have the most profound effect on discriminated groups both individually and collectively.

The third and the last ones influence the society as a whole, either individually or at the group level. Psychologists and sociologists often emphasize the importance of psychological effects of prejudiced actions on the quality of life of different discriminated groups (Allport, 1979; Arjava, 1996; Johnson, Thane, 1998; Fishbein, 2002; Isaac, 2006). They analyzed psychological causes and consequences, such as physical and mental health problems due to discrimination (Pascoe, Smart Richman, 2009; Shannon et al, 2009; Fisher, Wallace, Fenton, 2000; Williams, Mohammed, 2009) and interdependence between self-esteem and perceived discrimination (i.e. whether low self-esteem comes as a result of feeling discriminated or vice versa) (Thijs, Piscoi, 2016); the influence of values on discriminatory attitudes (Wetherell, Brandt, Reyna, 2013) and the influence of discrimination source on its consequences (Benner, Graham, 2013).

On the other hand, economists look at a more rational side of the problem and on the situation within the economic system like price discrimination for various reasons such as imperfect competition (Kumar, Kutlu, 2016), asymmetric costs (Horstmann, Krämer, 2013) or different geographic areas (Ata, Dana 2015) and law researchers at the existing laws and at the legal cases of the anti-discriminatory legislation being broken (e.g., Hepple, Szyszczak, 1992; McColgan, 2005; Ellis, Watson, 2012; Khaitan, 2015).

The interdisciplinary research tends to analyze the problem from a more complex point of view, looking both at economic and social side of the situation such as influence of discrimination on organizational performance (Kunze, Boehm, Bruch, 2011) or discrimination against immigrants in financial markets (Cavalluzzo, Cavalluzzo, 1998; Aldén, Hammarstedt, 2016).

Thus, with discrimination being present at different levels and in different domains, it is very important to know macro-level as well as micro-level.

In this sense Lucas' (2008) approach to discrimination is important. He is against defining discrimination

> "in an atomistic, individualistic manner" (Lucas, 2008, pp. 239-240)

and then tracing its

> "effects back to particular economics spheres" (Lucas, 2008, pp. 239-240)

as researchers usually do. For example, if one firm discriminates against women it does not only influence women who apply for jobs in this firm and get discriminated. It also influences other firms who do not discriminate by increasing competition between women applying to this non-discriminating firms. Thus, even women who never even heard of discrimination will face its consequences. In addition to that, people who discriminate as employers may hold other roles in the society and discriminate in these other spheres as well. Therefore, tracing discrimination back to specific spheres only is not enough.

According to Lucas (2008), discrimination is a *damaged social relationship*, that it is not done by just individuals but by social individuals who do not act independently of

> "norms, values, and public support mechanisms" (Lucas, 2008, p. 175).

First of all, those social constructs, values, mechanisms and norms live much longer than specific individuals who make discriminatory actions. Moreover, these social constructs live for

so long that influence even those who had no connection to their creation but are still exposed to the consequences, meaning that even if individuals had not participated in the emergence and creation of discriminatory practices, they still live in the society that is full of discriminatory norms and attitudes. The relations between individuals are indeed relations between *social* individuals, i.e. types and groups of individuals, who are subject to social evaluation, who make social judgements and behave accordingly, thus possibly enforcing discrimination even if particular people do not mean to discriminate consciously. They just do what their "type" of individuals are supposed to do to other "types" of people. Thus, according to Lucas, a more serious analysis of social frameworks is necessary. He believes that it is not possible to find discrimination at an individual level as it does not encompass the global situation in the world which is represented by the way society is structured as a whole with its norms and legislations.

This is where macro level studies enter the picture. Instead of analyzing behavioural factors that depend on identifiable actors and identifiable occurrences rather than on the relation between categories of people, Lucas suggested analyzing environmental factors

> "such as laws, regulations, policies" (Lucas, 2013, p. 97-99).

According to Lucas, using legislations and indices is more profitable in the sense of social context as discrimination is usually so deeply ingrained in the society and people's thinking that understanding the real level of discrimination is impossible because people tend not to understand themselves whether they discriminate or not. Laws, on the other hand, are objective reflections of societies' attitudes towards potentially discriminated groups. Lucas proved his point by constructing indices for gender and racial discrimination in different USA states from 1940 to 1990. The most complicated thing with such approach is choosing suitable laws as indicators of discriminatory environment for discriminated groups, as well as comparable entities (such as countries, states or organizations) with different legislations. While in the beginning and the mid-20$^{th}$ century anti-discriminatory legislation was non-existent or almost non-existent and, thus, finding indicators of discrimination for this period and before them should be relatively easy, nowadays, with legislations against most types of discrimination in place, finding necessary laws in which discriminatory attitudes are ingrained may be more complicated. For this reason, we believe that conducting analysis on the micro (individual) level, even if understanding its limitations, can still be beneficial.

Therefore, nowadays, although laws exist that prevent discrimination and protect vulnerable groups and the political correctness conceals and disguises discrimination, finding it is even harder, and, in certain situations, behavioural indicators, either at the micro or macro

level, are as important as laws. In addition, unlike what Lucas ideas about the prominence of the macro nature of discrimination, the micro level can also show discrimination, and also in the situations when it hides at the macro levels. For example, according to research on the influence of social networks on discrimination in the labour market,

> "although individual employers might be perfect discriminators, this may not generate employment inequality if mutual discrimination tendencies across different firms are balanced" (Takács, Bravo, Squazzoni, 2018).

This means that individuals may act in a discriminatory manner, but this will not necessarily show at the aggregate level. Thus, the interconnection between micro and micro levels must be considered in that studying individual level and individual actions is no less important than studying the macro level.

Now, after discussing the phenomenon of discrimination and presenting a general picture of its place and role in the life of the society, we will move on to a specific type of discrimination that is the focus of this PhD research — age discrimination in the labour market.

# 3. Studying age discrimination in the labour market

In November 2017, a husband and wife couple from Colorado who felt themselves victims of age discrimination launched a campaign named "I, too, am qualified". They wanted to draw attention to the continued ageism issues in the workplace. On their website (https://itooamqualified.wordpress.com/), there are numerous stories of people shared in words and photographs who had employment problems (allegedly) due to their age. Someone had to lie about the length of their experience ("I have 23 years' experience in IT. I had to remove 13 years from my resume before I got an interview") or got lied to about why their candidature was rejected (the recruiter said that they chose another candidate with more experience, but the candidate soon found out that the vacancy was still open). In December 2017, companies such as T-Mobile and Amazon, got sued for targeting job advertisements to younger groups, thus complicating the job search for older candidates (Dwoskin, 2017).

Do these two examples present proofs of age discrimination? The response may seem obvious, but it is not as easy as it may appear. While denying older age groups access to job advertisements is a rather objective fact, which reveals a discriminative treatment of older job searchers, personal claims of victims may be biased, by either not showing the full extent of discrimination or exaggerating it.

Age discrimination in comparison with other forms of discrimination has its own peculiarities. First, it is less investigated and has less tradition compared to either gender or

racial/ethnic discrimination. Its origins trace back to three-four decades, starting when European countries began to face ageing issues, even though some papers can be found earlier, in the 1970s.

Age discrimination concerns both discrimination of young workers who have only recently entered the labor market and discrimination of older worker who are reaching their pensionable age. It has been a standard issue in the labor market that being young and inexperienced decreases chances of successful employment. The same holds for those who are "too old": they are thought to be unable to cope with the workload physically or intellectually, to master new technologies, etc., so that their chances of being fired and having trouble of finding a new job for a long period of time increase as compared to those of younger, yet with some experience, workers.

Discrimination of young people in the labour market is not the concern of this research, yet youth unemployment is an issue, with younger people being discriminated for lack of experience (Krings, Sczesny, Kluge, 2011). This is a tricky situation that tends to create a well-known vicious cycle: employers seem to have a relatively reasonable claim of being in need of experienced workers, but it is impossible to gain experience without working. There is a substantial number of publications concerning youth unemployment (e.g. Barbulescu, 2012; Refrigeri, Aleandri, 2013; Gontkovičová, Mihalčová, Pružinský, 2015) with the reasons for it being attributed to different economics cycles and to the mismatch between knowledge gained by young people during their studies and the requirements of the labor market rather than to discrimination. It is also necessary to state that research shows little or no competition between youth and elderly workforce (Eichhorst et al., 2014) because of "the limited substitutability of the two age groups due to differences in sectors, occupations, experiences and skills" (Eichhorst et al., 2013, p. 8).

In what concerns discrimination of elderly workers, the reasoning behind scientific interest, firstly, comes from the fact that people live longer now than before and, thus, stay longer in retirement (and in the labour market due to the increase in retirement age in many countries), and that their share in the population increases. If on average in 1950 life expectancy was 65 years in developed countries and 42 in developing ones, by 2010-2015 it was estimated at 78 and 68 years respectively, and by 2050 it is expected to increase to 83 and 75 respectively (United Nations, 2013, p. 6). In 2010-2015, women were expected to spend in retirement on average 20,8 years, while this figure is expected to become 25,8 years by 2060-2065. For men, the figures are 17,4 and 21,9 years respectively (OECD, 2015, p. 155). Moreover, according to the World Health Organization, between 2015 and 2050 the share of the population older than 60

years of age will increase from 12% to 22%, and in 2050, 80% of them will live in low-income and middle-income countries (WHO, 2018).

Secondly, the birthrate is much lower than it was in the past and, thus, there are fewer young people in the labor market. Also, for countries with the redistributive pension systems it means a higher tax burden on the working population as the ratio of the working population to elderly retired population is decreasing. For example, "for the OECD as a whole, the dependence ratio of older people (i.e. those aged 65 and over as a proportion of those aged 20-64) will rise from the current figure of 22%, to 46% in 2050" (Official OECD website, 2015).

All this put together lead a lot of countries to the conclusion that the retirement age needs to be increased, and almost all countries followed through with the increases to one extent or another (OECD, 2015). This, in turn, resulted in the necessity to understand the position of elderly workers in the labour market who, as we will see later when discussing literature on age discrimination in the labour market, could potentially face employment problems.

# 4. Issues of ageing

Age discrimination is, probably, one of the most complicated forms of discrimination to be studied as contrary to gender or race, age is a factor that can influence person's abilities. Even European Union's Council Directive 2000/78/EC of 27 November 2000 specifies that

> "differences of treatment on grounds of age shall not constitute discrimination, if, within the context of national law, they are objectively and reasonably justified by a legitimate aim, including legitimate employment policy, labour market and vocational training objectives, and if the means of achieving that aim are appropriate and necessary" (Council Directive 2000/78/EC, Article 6.1).

For example, in respect to older workers it means that an employer can fix a maximum age for a position if this decision is based on certain training requirements and/or a necessity of a

> "reasonable period of employment before retirement" (Council Directive 2000/78/EC, Article 6.1 (c)).

However, research is contradictory in what concerns the changes in people's abilities as they age.

On the one hand, there is proof of older workers being less able in certain situations than younger workers. On the other hand, certain research results showed the contrary or, at least, the facts that older workers are no worse than younger one. Finally, there are also studies that proved older workers having certain shortcomings linked to their age but being able to compensate for them in various ways.

It is true that certain abilities such as learning (e.g., Zancada-Menendez, 2015), memorizing (e.g., Luo, Craik, 2009; Etcheverry, Terrier, Marquié, 2011), reaction speed (Makishita, Matsunaga, 2007), other cognitive (Federmeier, Kutas, Schul, 2010; Rosenblum, Enger-Yeger, Fogel, 2013; Wagner, Hassanein, Head, 2014) and psychomotor functions (e.g., Oehl, Sutter, 2014) tend to deteriorate as people become older.

For example (Kang, Yoon, 2008), when interacting with complicated electronic devices, younger (20-29 y.o.) and older (46-59 y.o.) people showed similar results in completing tasks but older people needed more steps to achieve the aims set for them. This can be explained by the fact that older people made more errors and more repeated errors that younger adults. Motor skills that tend to deteriorate with age and trouble with the application of previously acquired knowledge in the new domains of familiar tasks also prevented older adults from completing some tasks as quickly as younger adults. However, age was not the only factor: experience and background knowledge tended to be no less or even more important. Older adults often used a trial-and-error strategy, but, as the authors of the study argued, this is rather a characteristic of a novice user than an age factor. Because of this, older users became frustrated in the process of completing tasks as they were unfamiliar with the devices, not due to them being unable to master their usage. Thus, as research suggested, certain design modifications that would fit age-related changes better and encouragement of older people to communicate more with electronic devices, should have improved the situation.

It is true that older people require more time than younger ones to learn novel tasks. However, learning becomes especially complicated if older people have audio or visual distractions during the process. Therefore, elimination of these distractors can provide significant benefit of older learners on the early stages of learning. Later on, distractors do not have such a detrimental influence on the results (Schwerha, Wiker, Jaraiedi, 2007).

Moreover, older people are often aware of their shortcomings and find ways to adjust and compensate for them. For example (Lobjois, Cavallo, 2006), when faced with a street-crossing decision-making experiment, older participants chose

> "larger time gaps than younger ones, enabling them to compensate for their longer crossing times resulting from their slower walking speeds" (Lobjois, Cavallo, 2006, p.941).

It should also be mentioned that at times different studies present contradictory results as they depend a lot on the specific age group selected as "older". The older are these groups the more often a significant age effect is found. For instance, a group aged 70-80 (Lobjois, Cavallo, 2006) was better at compensating for their slower walking speed than an age group 75+ (Oxley

et al, 2005). And this the age as which most people already stop working while those who face discrimination issues in employment are from 10 to 30 years younger.

However, in spite of older workers facing problems and having lower abilities on some levels, the research shows that often these do not have negative influence on job results (e.g., Rhodes, 1983; McEvoy and Cascio, 1989; Bennington, Tharenou, 1996), since older workers find ways to compensate for their deteriorating abilities (e.g., using a trackball instead of a mouse when working on the computer decreases exertion levels of older workers (Chaparro et al, 1999); the implicit memory of older people being no worse than that of younger ones which could be used to older people advantage (Brooks et al, 2001)). Moreover, according to some studies, older workers perform even better than younger ones (Fyock, 1991; Rhodes, 1983).

Therefore, the results of research regarding the abilities of older workers does not allow age to be considered a factor influential enough for a worker to be declined a job only because of his or her age, unless specific job requirements call for it or unless a worker has other issues that could prevent him from doing his or her job such as health problems or lack of necessary training.

# 5. Current state of research on age discrimination

As we have seen from the previous section, research provides contradictory evidence as to whether older workers differ from younger ones in their abilities and productivity (e.g., Warr, 1994; Marszalek et al, 2000; Xu et al, 2014).

Regardless of these research results not giving a strong proof of older workers being worse performers than younger once, according to previous studies, employers often tend to consider elderly workers less productive, less able to master innovative methods, less healthy, less motivated, etc. than their younger counterparts (e.g., Riach & Rich, 2007). Thus, with such contradictory results, any decisions based on age only will be discriminatory. To be true, the anti-discriminatory legislations put forward in the EU and the USA, as well as retirement age increase, did not help to absolutely eradicate age discrimination (Krings, Sczesny, Kluge, 2011).

There is a lot of literature on the problems of ageism, in general, and specifically in the labour market. However, as we already mentioned before, age discrimination is less represented in the literature than race or gender discrimination (Finkelstein, Truxillo, 2013; Ruggs et al., 2013), and finding publications covering age discrimination specifically is sometimes a bit tricky. It should be noted from the beginning that in general these studies more often than not make conclusions in favour of the existence of age discrimination, while the specificities and peculiarities may differ from country to country, especially, if changes in retirement ages where made in different times and the retirement age differs as well.

Researchers tend to approach problems of ageing from different angles.

Some of them cover such topics as adjustment to ageing, employment issues in older ages and the ways to tackle these problems (Baumann, 2016; Cheng et al., 2015; Scherger, 2016; Torp, 2015; Von Humboldt, 2016; Hofäcker, Hess, König, 2016). While these books do not make discrimination their only focus, they recognize its existence and role. Some specify its detrimental influence on health (Von Humboldt, 2016), others mention legal context, anti-discriminatory legislation, and its success in some countries (Scherger, 2016). However, in other countries high perceived discrimination among older workers, among other factors, lead to early retirement, in spite of the legislations in place (Torp, 2015; Hofäcker, Hess, König, 2016). Those books do not discuss mechanisms behind age discrimination, they just state it as a fact, based on previous research.

A big part of research that delves more into the mechanisms that is found on age discrimination are studies conducted on secondary data or by the usage of surveys (we will delve in methodological aspects and their pro's and con's a bit later). Often these studies prove the existence of stereotypes and negative attitudes towards older workers. Some studies show that the age in which the terms "older worker" starts being used varied from industry to industry, sometimes even starting from 35 years old (Duncan, Loretto, 2004), while 45 years old onwards is regarded as more standard (Kalish, Williams, 1983). Considering that this demarcation was suggested more than 20 years ago, before serious changes in the pensionable ages in most countries, the general age when age discrimination is more likely to start should now, from our point of view, be considered a little higher.

The survey studies usually take several directions: focus on self-perceived discrimination and/or its consequences (Hassell, Perrewé, 1983; Bennington, Tharenou, 1996; Bennington, Wein, 2003; Duncan. Loretto, 2004; Garstka, Hummert, Branscombe, 2005; Furunes, Mykletun, 2010; Kunze, Boehm, Bruch, 2010, 2013; Bayl-Smith, Griffin, 2014); specific case-studies (Manning, Carol, Carp, 2004; Dewhurst, 2013), studies of outcomes (such as employment/unemployment rates) (Neumark, Button, 2004) and the role of legislation (Wood et al., 2004; Zysk, 2006; North, Fiske, 2013).

Mostly, those studies put forward evidence of negative influence of discrimination not only on those discriminated but on the environment and work productivity as a whole. Among older workers perceived discrimination is often associated with low self-esteem which, in turn, leads to health problems, decreased productivity and results in behavior that enforces stereotypes about older people (e.g., conformity, risk-avoidance, etc.). On the other hand, there is a connection between job undertaken and perceived discrimination: older workers often consider themselves being discriminated (even if the employer is not being discriminative on purpose) if

they think that their work is not challenging enough (Hassell, Perrewé, 1983). This result holds for different countries, such as USA (Hassell, Perrewé, 1983) and Nordic countries (Furunes and Mykletun, 2010).

Studies of anti-discriminatory legislation in different countries (New Zealand (Wood et al., 2004); Poland (Zysk, 2006), EU Member States (Dewhurst, 2013), UK (Fevre, Grainger, Brewer, 2011)) show that, although, introduction of protection against age discrimination is effective the results are far from ideal, with discrimination de facto still being in place. Researchers highlight the importance of socio-economic context and the cultural norms (this being in line with Lucas' reasoning (Lucas, 2008, 2013) that are often so deeply engrained in the society that simple introduction of laws is not enough.

Apart from studies based on secondary data and interviews, there is also a number of papers that can serve as good examples of field, laboratory and survey experiments/vignettes in age discrimination. Usually they are conducted to see whether discrimination actually exists.

Usually, these experiments, as many other forms of experimental research in discrimination, are based on the manipulation of age in resumes of the candidates applying to certain job positions. In laboratory experiments subjects are usually asked to consider a list of resumes that vary mainly by age (sometimes appearance or employment experience can be also added) in regard to some kind of job applications and say whether they would hire this or that candidate or not. In field experiments researchers apply to real job proposals with different resumes. This can include later on real-life job interviews or (more often) not.

For example, Riach and Rich (2010) conducted field research on English labor market to see whether the age discrimination actually existed. For this they created pairs of job applications that differed only in terms of age but not in terms of qualifications and professional experience required for the job. The first pair of applications was sent from the women aged 21 and 39 for the job proposals that were requiring "new graduates". The second pair of applications was for waiters' positions from the men aged 27 and 47. The last one was from women of 27 and 47 years old applying for a position in job retail sales. Discrimination in favor of younger candidates in the first two cases and in favor of older candidates in the third case was found.

Similar studies were conducted by the same authors in Spain (Riach, Rich, 2007) and France (Riach, Rich, 2006) in which pairs of CVs from younger and older applicants were submitted for the positions of waiters. In both countries, significant rates of discrimination against older workers were found.

A similar cross-country field experiment about age discrimination in the labor markets of England, Germany, France and Spain was later conducted by Riach (2015) on the bases of email

applications for waiters' positions from the applicants aged 27 and 47. Discrimination of older workers was apparent in all countries but higher in France and Spain than in England and Germany. A field experiment in Madrid (Albert, Escot, Fernández-Cornejo, 2011) concerning gender and age discrimination, used a similar research method of fictitious job applications, and showed evidence of age discrimination against applicants aged 38 (younger applicants were 24 and 28 years old).

In 2015, there was an experiment (Baert et al, 2015) that differed from the classical field experiments on age discrimination in that aside from age, the fictitious older applicants differed from their younger counterparts also by their employment experience. The authors distinguished between employment in an in-field job, employment in an out-of-field job and inactivity during their additional post-educational years (compared to the younger fictitious candidates). The results of the research showed that the probability of getting a job was low only for those older candidates who had out-of-field employment and who were inactive before. Otherwise, they had the same chances of getting hired as younger applicants. A later paper about field experiment (Neumark et al, 2015) included both differences in employment experience and human capital investment levels (i.e. skill levels) in the resumes of the fictitious candidates. They found out that there was solid evidence of discrimination in hiring against older female applicants, but much less so against older male applicants.

However, while in these field experiments the researchers could control that their applicants differed in all but age, they could not control the environment in which the employers made their decisions. This limitation is shared by many field experiments.

There are not many recent survey experiments and laboratory experiments on age discrimination, most of them being conducted in the 1970s, 1980s and 1990s. They usually create hypothetical environments with managers and/or students asked to evaluate hypothetical candidates. The subjects may be asked to evaluate hypothetical resumes (Haefner, 1977; Fusilier, Hitt, 1983; Cleveland et al., 1988; Singer, Sewell, 1989; Singer, Bruhns, 1991; Perry et al., 1996) and/or hypothetical interviews (Connor et al., 1978; Locke-Connor, Walsh, 1980; Avolio, Barrett, 1987; Singer, Sewell, 1989) and rate or choose proposed candidates that may differ only in age or in age and other characteristics such as gender, race, education, competences, experience, typed of vacancy, etc. As results showed, age was an important factor in hiring decisions but other factors, including objective ones, also played role. However, preference for younger candidates compared to older ones was quite prominent.

To find laboratory experiments, we need to come back to the 70s and the 90s of the 20$^{th}$ century. They used hypothetical resumes and interviews with hypothetical candidates that differed in age and other factors. The results could be considered somewhat contradictory.

For example, in a hypothetical hiring experiment in which 286 participated Haefner (1977) found that younger candidates with high level of competencies were hired more often than older candidates with high level of competences. However, with low competent candidates age did not impact decisions significantly. Contrary to these findings, Connor and colleagues (1978) ran an experiment on psychology students who were asked to assess young and old candidates for a temporary job vacancy. The last was done to avoid bias concerning shorter working periods of older candidates. According to the authors, age did not impact the decisions, with other factors such as relevant background being more important. Additionally, experiment conducted by Locke-Connor and Walsh (1980) showed the importance of age only in the situations when the participants did not have enough other information about candidates on which they could base their decisions. However, younger participants tended to give higher evaluation to younger candidates and older — to the older ones (Gibson et al., 1993). Furthermore, some research (Perry et al., 1996; Perry, Bourhis, 1998) showed that older workers were evaluated lower than younger workers in general even if they were evaluated higher for the "old-typed" jobs (and lower for the "young-typed" jobs).

Fusilier and Hitt (1983) conducted experiments with students presenting them candidates who varied in age, race, sex and experience. Experience proved to be the most important factor influencing the decisions, not age. However, the greatest influence of experience was for the eldest groups (aged 55). Nevertheless, Avolio and Barrett (1987) found that younger candidates were considered to have higher "future potential" than older candidates and were evaluated higher. However, if the participants were asked to compare an elderly candidate with the candidate whose age was not specified, there we no considerable differences in evaluation.

Cleveland and colleagues (1988) showed that the ratio of older and younger candidates among all candidates presented to the participants of the experiment influenced their evaluation, i.e. older applicants received higher ratings if their share was higher among all participants and lower ratings if their share was lower. If there was equal number of the participants, then age had no significant influence.

Singer and Sewell (1989) ran an experiment on managers and psychology students presenting them with resumes and videos of candidates who differed in age, type of job vacancy (financial manager and account clerk) and additional age-related information. The last one meant that one group of participants received information that older workers were responsible for the success of the company while another did not receive any kind of age-related information. Type of job had the most significant effect. Managers and students gave different responses. For managers' decisions "purely" age was not significant while it was significant with students'

decisions. Still, managers, in the case of account clerk job tended to hire older workers if they received age-related information and younger workers if they received no such information. With students the situation was different: for the financial manager job they hired older workers if there was no age-related information and younger workers if there was. Singer and Bruhns (1991) also showed the importance of work experience (which is connected to age) and that managers valued experience more while students valued academic qualifications more.

As we can see, previous laboratory studies on age discrimination showed that age had a significant influence on hiring decisions, sometimes in favour of younger candidates, sometimes of the older ones (but with younger, in general, being preferred more frequently). However, they also showed that other factors can matter, such as the type of the job, experience, competence or additional age-related information. Thus, more research is required in this domain. Especially, as country differences can also impact the role of the age factor, and what could be correct for one country may turn out wrong for another.

As for survey experiments, in a recent research Kauffmann and colleagues (2015) studied the ways in which job candidates' facial age appearance influenced hiring decisions. This was a study conducted online. The candidates' ages were manipulated either by the specification of the date of birth / age or by a headshot. The selection intentions were considered a dependent variable, and perceptions of person–job fit, health and fitness impressions served as mediators. Also, design-external anonymous job application condition, in which the candidate's age was not specified, was added. The results showed that older looking candidates were considered less healthy and less fit for the job, and thus the likelihood of them being hired was lower than that of the younger candidates.

Richardson and colleagues (2013) ran a similar research, but not based on facial impressions, just on age. Two types of participants (102 students and 54 organization-based employees) were asked to evaluate the competences and hiring likelihood of hypothetical applicants aged between 33 and 66. The results showed that candidates who were identical in everything, but age were treated differently in terms of hiring. Until the age 42-45, the probability of being hired increased as age increased, while after that the age increase lead to the decrease in the probability of being hired. The existence of work-related competences did not have a mediating effect on this relationship. Thus, it proved the existence of age discrimination. It should be noted that the results of students and organization-based workers did not differ a lot.

All in all, we can see that previous research conducted in different countries in different time periods, some of them even as early as in the end of 1970s, even before the issue of increased age expectancy became an issue, show proofs of older workers often feeling discriminated with legal cases and experimental research supporting the facts of unequal

treatment even though numerous studies show that older workers cannot automatically be considered worse than younger ones on the basis of age only.

However, as was said before, all methods are not ideal, and there is a lot to learn about the mechanisms behind discrimination and in terms of distinguishing objective decisions from discriminative ones. Thus, all-around studies are necessary with delving inside of the decision-making process itself in order to really understand what is going on in this domain.

# 6. Theories behind age discrimination

While theoretical background for age discrimination is not as abundant as for gender discrimination, for example, there are, however, theories that need to be discussed.

Wood and colleagues (2008)[2] presented quite a full account of theoretical approaches towards age discrimination. They distinguished between neo-liberal approaches, political economy approaches, approaches from the point of view of rights and distributive justice and postmodern approaches. We will now briefly summarize all of them and then discuss each in more detail.

So, the main reasons for age discrimination suggested by neo-liberalists are:

- the expensiveness of older workers in terms of their higher pay which makes them less attractive for the employers who would prefer someone younger with lower pay demands (e.g., O'Boyle 2001, p. 960);
- choices made by older workers themselves, meaning that some older workers do not engage enough in self-presentation in the labour market and upgrading of their skills thus becoming uncompetitive with younger workers (e.g., Peng, Kleiner, 1999, p. 74; Shen, Kleiner, 2001, p. 25), while others prefer or are forced to find jobs in which they will be payed less but have more flexibility in terms of working hours (e.g., Sargeant, 2001, p. 114);
- imperfect information in the labour market, which provides employers with biased and wrong knowledge about older workers' skills and abilities (e.g. Glover and Branine, 1997, p. 275).

Political economists highlight the following reasons:

- in the periods of crisis (e.g., in the 1970s, during the classical Fordism crisis) employers need to decrease their costs with older workers who are closer to retirement and/or who work in the declining sectors more often than younger ones becoming more discriminated than the workers of younger ages (e.g., Kelly,1998; Taylor, Walker, 1997, p. 307–308);

[2] All citations in section 6, unless specified differently, are provided by Wood et al. (2008)

- current cultural norms value youth higher than elderly (e.g., Branine, Glover, 1997, p. 237; Macnicol. 2006, p. 11);
- age discrimination being a result of a more profound and vast problem of social exclusion (workers who had less education (Barnes et al., 2006) or who worked in manual occupations (e.g., Boyes, McCormick, 2005, p. 3) all their lives tend to have the more problems with employment and health the older they become);
- age discrimination is tied to other forms of discrimination (e.g. older women face more employment problems than older men due to worse education (Schuman, Kleiner, 2001, p. 50) or gaps in employment during the periods pregnancies and raising of children (e.g., Evandrou, Glaser, 2004, p. 771).

The supporters of the rights and distributive justice point of view say that age discrimination is a result of absence of regulations in the free labour market that lead to social inequalities and distributive injustice and that are not only the result of abilities but also of risks of particular jobs that unjustly fall only on the shoulders of older workers (e.g., O'Boyle, 2001, p. 962; Branine, Glover, 1997, p. 237).

Postmodernists say that in the recent times the society changed in a way that knowledge and experience of older workers get devalued with time (e.g., Glover, Branine, 1997, p. 277), thus making them less attractive for the employers and creating a generally negative image of the elderly in the society in general (Featherstone, Hepworth, 1989). Older workers, on the other hand, tend to consent to this and sometimes become even more conservative and not prone to adapt to changes (e.g., Glover, Branine, 1997, p. 277).

It has to be noted that some of these theories may come true for some countries and/or even sectors of production but not true for others. Furthermore, some of them might have been relevant in the past but may no longer be relevant in the present days or in the near future. The society is aging in general, people live longer and are more active than before. Therefore, the views in the societies, albeit if not without help from social policies, tend to change and become more elderly friendly. Specifically, it concerns European countries with a high percentage of older people where increasing retirement age due to demographic problems leads to necessity of promotion of active and better image of ageing.

In addition to that, while these explanations are quite thorough, we think that they need to be discussed; in fact, it can be argued that some of them mix together explanations for inequality due to discrimination and explanations for inequality due to factors that are not necessarily connected to discrimination.

We will talk about them one by one. When elaborating on these theories, it is important to keep in mind the definition, the essence of the term "discrimination", that it happens when a

person in denied equal treatment because he/she belongs to a certain group and not because of his or her own personal and objective characteristics. And we will analyze discrimination from this point specifically as inequality may happen due to different reasons.

To start with, let's turn back to neo-liberal explanations.

Firstly, the costliness of older workers compared to younger workers will only become a source of discriminatory actions if an employer is already prejudiced against older worker in the sense of their costliness, i.e. if he/she is prone not to consider older applicants regardless of their experience and competencies. If he/she is not, and there are other reasons that make a younger worker a better fit than an older worker in professional sense than this is not discrimination.

Secondly, neo-liberalistic explanations about elderly making their own choices may also have nothing to do with discriminatory actions of employers. These, actually, are *choices*, probably, indeed made by some elderly workers that lead to them ending up in an unequal position compared to younger workers. However, these decisions do not come from discrimination per se. For example, an older worker for any kind of personal reason (a wish to spend some more time with grandchildren or to health problems) may wish to have a more flexible work schedule. If this flexibility will not influence in any negative way his/her ability to perform her job functions, then denying it will be a form of discrimination. If, however, the specificities of the job do not allow more flexibility without the disruption of the work process, then denying it to the worker will not be an act of discrimination. Consequently, if the worker is unable to work without an increased level of flexibility and seeks a job, even a lower paid one, that will accommodate his/her needs in this sense, then the issue is not with discrimination but with the workers own abilities. If this happens due to the circumstances that do not depend on the worker (e.g., health or family problems), then, in order to avoid this person falling into a position of poverty and facing even more problems, actions are required form the governmental institutions in the forms of improvement of the health care services qualities, subsidies to the businesses that would make it possible to hire additional workers without letting an older person go, social benefits to older people who are unable to work as actively as before, promotion of active aging, etc.

Another explanation about older workers not investing enough in their self-presentation and/or skills may also have two sides. Personal laziness is in no way discrimination from the side of employers. However, if workers due to their older age have been denied access to training, especially, if their younger peers did not face similar problems than this is the case of discrimination. If older workers, through no fault of their own, do not have information about the existence of training or the necessity of this training, due to them being considered too old to be interested in this, then this is, too, discrimination.

Probably, the imperfect information theory is the closest (among neo-liberal explanations) to explaining discrimination and not inequality arising due to other factors. The issue of imperfect information does distort the image that employers have about older workers. If they do not have the full picture, then their knowledge about older workers' abilities may become biased and incorrect. In this case, the employer will fall the victim of statistical discrimination when, being unable to test the candidate's abilities on the spot, he or she will hedge risk and hire a younger worker assuming based on the labour market imperfect information that the younger worker is likely to perform better than an older one.

Political economy theories also seem to be better in explaining problems of older workers in terms of discrimination.

The fact that the firms are attempting to decrease costs in the periods of crisis at the expense of older workers may certainly come from discriminative practices. However, here, as with some other previous explanations, a lot depends on the reasons. Decreasing costs is necessary for a firm to survive during crisis. Dismissing the least productive workers is also necessary. And if an older worker happens to be less productive than a younger one than dismissing him/her does not mean acting discriminatively. If the dismissal happens due to the assumptions about older workers being less motivated, too close to retirement, etc., than this is the case close to the imperfect information explanation, which is discrimination.

Cultural norms that look at "youth" as positive and "elderly" as negative can be considered a situation of classical pure, tastes-based, discrimination that comes from prejudice and negative stereotypes and perceptions about elderly people. It also fits Lucas's (2008, 2013) theory about discrimination being a social construct with certain "types" of people acting towards other "types" of people in a specific, negative, way due to the environment around them. These environmental and cultural issues may put older people at a disadvantage through no fault of their own. While there is, surely, more to it than simple images of "old" and "young", these cultural norms approach seems to be fitting the age discrimination explanation better than most of the other ones.

As for the social exclusion explanation, this approach, again, seems to tell more about inequality due to other factors than about discrimination. At the very least, it is about other forms of discrimination that do not concern age specifically. Obviously, a less educated or a less healthy person will have more problems finding a job at an older age than his/her better educated and healthier counterparts. However, these problems will not come from the age itself but from other objective and subjective characteristics, even, maybe other forms of discrimination, such as gender of racial discrimination, that, definitely, need to be dealt with, but outside the limits of *age* discrimination framework.

The connection with other forms of discrimination is a more complicated thing and requires discussion of those other forms and not just age discrimination. Still, we should always keep in mind that the situation when a person has worse skills at a certain age than another person even if as a result of discrimination (for example, based on gender), the employment problems will not result from *age* discrimination but rather from other forms of discrimination that he/she encountered in the past.

The rights and distributive justice explanation also lie more in lines with inequality or simple fact that people are different than discrimination. Obviously, there are types of jobs, especially, manual, low-skilled ones that require abilities that older people are less likely to possess but if they have trouble keeping their jobs not because of prejudice and assumptions of employers made not on the grounds related to work skill but because of inability to keep up with the job, this is not discrimination.

Postmodern explanations raise an important issue of today's world being a very fast-changing one in which knowledge received some years ago loses value much quicker than in the previous century. Thus, if older workers fail to keep up with recent technologies and any knowledge that is indispensable in their field of work be it computer knowledge or changing in the managerial practices, they risk losing their competitiveness. Discrimination, however, does not come in the picture just yet as lack of necessary skills is an objective factor, not a subjective one. However, discrimination of older workers does not come from the fact that the world is changing quicker. Putting it that way would actually mean that older people are automatically unable to keep up with changes which is discriminatory in itself.

It is true that constant learning through the course of life is important, now more than in the previous centuries. However, as we have already said, when discussing other theories, there can be different reasons as to why older people lack necessary training. It can be their own choice, lack of ability to follow the changes, lack of access to necessary training, lack of necessary information about the importance of this training. If an older worker does not want to keep up with this fast-changing world or is absolutely unable to do that due to serious health problems, this is not a situation of discrimination. It is, however, if he does want to and can but faces obstacles on the way.

As we have seen in the previous sections, the research about abilities of older workers to master new methods compared to the abilities of younger ones does not produce univocal results. Yes, people change with age, certain things become harder for them, some things become more difficult than before, but it does not mean that there is no way for them to learn at older ages. If older workers are denied this than there is an issue of discrimination.

Thus, we can divide the theories presented into following categories:

- those that explain only inequality;
- those that can explain either discrimination or inequality arising due to other factors depending on the reasoning behind the actions;
- those that explain specifically discrimination.

This categorization is presented in the Table 1. Here we can see that most of the theories depend hugely on what lies behind the decisions of the employers. This makes disentangling of inequality from discrimination a very tricky task, and when we look at the methodologies used to study discrimination, it becomes even trickier. In our research, we will make out best attempt to eliminate the doubtful theories (column two), focus only on the two discriminatory explanations (column 3) and, if possible, distinguish between the two. We will discuss this in more detail in the conclusions of this Chapter and throughout Chapters 2 and 3.

Table 1 — Possible theories behind age discrimination

| Explain only inequality | May explain either inequality of discrimination depending on the reasoning behind the decisions made | Explain discrimination |
|---|---|---|
| 1. A result of a more profound and vast problem of social exclusion | 1. Costliness of older workers<br>2. Choices made by older workers themselves<br>3. Attempts to decrease costs in the periods of crisis<br>4. Tied to other forms of discrimination (e.g., gender discrimination)<br>5. Risks coming from certain types of jobs that only older people bear.<br>6. Knowledge and education devalue with time => negative image of older workers | 1. Imperfect information in the labour market (statistical discrimination)<br>2. Cultural norms that favour youth at the expense of older people (tastes-based discrimination) |

As so many possible explanations behind actions that create inequality can be results both of objective factors and discriminatory attitudes, it is very important to find ways to see what stands behind the actions, the reasoning, which is not always easy with the methodologies used to study discrimination.

# 7. Methods for studying discrimination

Since Becker (1971), Allport (1954 (1979)), Phelps (1972), Arrow (1973) and Aigner, Cain (1977) methods employed to study discrimination have not changed much. Keuschnigg and Wolbring (2015) list them quite thoroughly. While these methods are being used for

studying various domains of discrimination, when discussing them we will make particular focus on their implementation in the labour market.

Firstly, there are interviews. They are usually conducted among individuals who are either at risk of being discriminated due to their gender, age, race, etc., or who, due to their positions, may discriminated themselves (e.g., employers in the labour market). This is a good way to study attitudes towards discriminating and/or being discriminated, to understand how people actually feel and what they have actually experienced. Nevertheless, it is well-known that, on the one hand, people tend to give socially acceptable answers, i.e. they would not voice their discriminatory reasoning aloud and may even be unaware that they are acting in a discriminative way (Baumann, 2016). On the other hand, people often tend to underestimate they actions, overestimate their abilities, i.e. those who feel themselves being victims of discrimination may not be ready to face that there were objective factors that lead to them ending in an unfavourable position. There is also an opposite risk: the interviewees may not understand that they are being discriminated and consider their situation normal and just due to the environment they have been raised in, for example. Therefore, interviews often hold risks of either overestimating or underestimating the level of discrimination.

Secondly, there are various experiments, field and laboratory being the main ones, with vignettes and survey experiments as their variations. Laboratory experiments, obviously, have problems with external validity, while field experiments — with internal validity (e.g., Gadlin, Ingle, 1975; Roe, Just, 2009). Field experiments conducted to analysis discrimination in the labour market have the benefits of seeing real decisions by employers who do not know that there is an experiment going on. Researchers send resumes the candidates who differ only in a particular factor based on which they can be discriminated to the firms. Then, they analyze the response rates. The downside of is that researchers have no way in finding out how the decision process took place and what other factors influenced recruiters' decisions. Contrary to that, in the laboratory experiments it is easier to control for most of the factors that may influence the decisions, but it is impossible to completely recreate reality, hence arguments about the external validity of such experiments. Thus, researchers need to be careful in designing experiments in both cases as they are both useful in understanding the situation with discrimination, but each have their weak sides. Which type of experiment is better, depends on the specific aims of the study conducted.

Next, the third method of studying discrimination is the analysis of the outcomes such as rates of unemployment or income. However, this approach is strongly criticized by Lucas (2008, 2013). According to him, on the one hand, if the results do not show any inequality in the rates of employment or incomes, it does not mean that there is no discrimination going on, it still may

be present, just in a different form. On the other hand, finding inequality also does not help understanding discrimination. It is hard to disentangle inequality in outcomes arising from discrimination from inequality arising from other factors. He, in turn, as we already mentioned above, suggested analyzing the level of discrimination with the help on environmental factors and uses juridical, social, economic and political domains to single out environmental indicators. After choosing these indicators, he compares outcomes in the USA states that have high levels of discrimination with the states that have low levels of discrimination.

This approach allows to see how the position of people from discriminated groups differ depending on the rate of discrimination in the environment that they live in. From Lucas's point of view, this is a better way than comparing discriminated groups with non-discriminated groups. He claimed that a black person can never become a white person and a woman can never become a man. Thus, comparing these groups between each other does not produce the correct results for discrimination studies. It is more useful to analyze how the same groups fares in different environments. While this is a new and very useful approach which allows to study discrimination from a completely new angle, it also seems to have certain problems. Mainly, as we have said, an as Lucas points out himself, these issues lie with, firstly, finding appropriate environments to compare that do differ in terms of discrimination level (e.g. cities and regions, depending on the countries, may not have enough differences in indicators if there is need to assess discrimination inside one country). Secondly, choosing appropriate indicators also takes time and care, and it may be complicated in today's world where legal framework is aimed at prohibiting discrimination. Thus, finding indicators will be a subtler job for contemporary society than it would be for studies of discrimination in the past decades.

Finally, there is a method of agent-based modelling (ABM). It is "the computational study of social agents as evolving systems of autonomous interacting agents" (Janssen, Ostrom, 2006, p.1). Recently, empirically-based ABMs became particularly popular in the social sciences (Janssen, Ostrom, 2006, p.2). It is also, yet less often than other methods, used to study labour market discrimination (e.g., Lewkovicz, Domingue, Kant, 2009). It is particularly helpful in understanding

> "the functioning of labor markets and the consequences of the labour market policies" (Neugart, Richiardi, 2012).

On the one hand, the properly specified and calibrated models turn out to be useful tools. On the other hand, there are some issues with empirical validation of the models (Fagiolo, Moneta, Windrum, 2007, p. 217). Moreover, their quality depends a lot on

"the availability, quality and bias of available data sets" (Fagiolo, Moneta, Windrum, 2007, p. 222).

As it is possible to see, all methods used to study discrimination have their strong and weak points. A lot of them risk mixing discrimination and inequality that arises due to non-discriminatory reasons. In order to conduct a thorough analysis of discrimination, it may be useful to use different approaches to study the same topic.

# Discussion and conclusion

In this review, we have discussed the concept of discrimination, considered different approaches and presented the state-of-the-art in this domain and in age discrimination in the labour market more specifically.

Our excursus suggests that while discrimination is a very popular and widely researched topic, it is a very delicate and ambiguous phenomenon that needs to be studied carefully and with the help of various approaches in order to be able to grasp its full extent, roots and the mechanisms that lie behind discriminatory actions.

It means that to our opinion the only way to research discrimination thoroughly and to distinguish it from inequality, is to methodically study it with all means available. There does not exist, as of yet, any method that would guarantee a correct response to the questions that we usually raise. Are these groups being discriminated or not? If this is discrimination, where does it come from? What are the reasons behind it?

Trying to reach this goal within the scope of dissertation research, even for one country only, would be overly ambitious. However, we will try to at least touch the issue from some of the angles.

The main focus of this research is on issues with the employment status of the older workers, i.e., in our case, employment rates and hiring.

Thus, here we will approach this problem from different sides: micro (analysis of hiring decisions through laboratory experiment) and macro (policy analysis through the use of quasi experimental technique).

We will not be using interviews because (as was discussed in Section 7) the participants are usually prone to provide biased and socially acceptable response, thus underestimating or overestimating the level of discrimination while here we will be trying to see a more objective picture. We also will not only outcomes as they the risks of finding inequlity and not discrimination are very high (also discussed in Section 7). Finally, ABMs is not out method of choice because we would like to analyze not only mechanisms but also the reasoning behind the decisions made and the role of policies that are already in place, for ABM will not be the optimal choice.

In both papers we will be using experimental approaches that, in recent years, have not been widely used in age discrimination research.

In the next chapter we will, use secondary data (European Union Labour Force Survey) to analyze the effect of the introduction of the anti-discriminatory legislation in Italy in 2003, specifically, how it influenced the older age group (55-59). While it is very complicated to directly study the existence of discrimination through the use of secondary data from the surveys, it is quite possible to see whether the legislation changed the situation, and whether it had specific influence on the target group without influencing younger age groups, i.e. those who are old enough not to be at risk of discriminated due to being too young (35-39, in our case). And in this way, we can find indirect proof of existence or absence of discrimination.

In the third chapter, we will introduce a laboratory experiment based on the methodology more often used in field experiments and survey experiments/vignettes with certain modifications to control for unobservable factors at the same time creating an environment as close as possible to real-life situation.

As we discussed in Section 6 of this review, there are two theories on age discrimination that could explain purely discrimination: imperfect information, or statistical discrimination, and cultural norms, i.e. tasted-based discrimination; and several that could explain both discrimination and simple inequality happening due to non-discriminatory issues.

In Chapter 2, the methodology we used will help us understand whether, other things being constant, the introduction of the anti-discriminatory policy improved the employment rates of older workers. We will not be able to distinguish between the two types of discrimination, but we will be able to control for such factors as personal choices, crisis issues, other forms of discrimination, types of job and education levels. While we will not be able to completely eliminate the factors that could arise from unobservable factors, we will be able eliminate most of them and analyze others through the logic of *ceteris paribus* before and after the policy introduction.

In Chapter 3, we get rid of the factors that could explain both and try to see whether we there is an issue of discrimination of older workers and, if there is, whether we can distinguish between the two "purely" discriminative approaches.

We believe that in these two papers will be using the most suitable and available approaches to address discrimination specifically (and not inequality arising due non-discriminatory issues), to eliminate as many unobservable factors as possible and to get a more prominent view of the situation.

# Chapter 2. The influence of anti-discriminatory legislation on the employment of elderly workers in Italy[3]

## Introduction and motivation

Age discrimination in employment has been a proven issue in USA and European countries for several decades now. Both young and old workers can be the target of discrimination, the former because of lack of experience (Krings, Sczesny, Kluge, 2011), the latter on the basis of stereotypes concerning their abilities, motivation and productivity (Riach, Rich, 2007; Rosen, Jerdee, 1976). As Roscigno, Mong, Byron and Tester point out, older workers tend to be seen by both younger co-workers and the management as

> "inflexible, slow, unorganized, difficult and expensive to train" (2007, p. 314).

However, as we have discussed in the previous chapter, empirical research shows that, even though older age does have a negative influence on certain abilities (e.g., Kang, Yoon, 2008; Luo, Craik, 2009; Wagner, Hassanein, Head, 2014; Zancada-Menendez et al, 2015), it does not necessarily have negative consequences on job results (e.g., Rhodes, 1983; McEvoy and Cascio, 1989; Bennington, Tharenou, 1996), since older workers find ways to compensate for this (e.g., Chaparro et al, 1999; Brooks et al, 2001; Lobjois, Cavallo, 2006; Schwerha, Wiker, Jaraiedi, 2007). Actually, according to some studies, older workers perform even better than younger ones (Fyock, 1991; Rhodes, 1983).

As was mentioned in the Section 6 of Chapter 1 where we discussed the theories behind age discrimination, older workers may suffer termination also because they command higher wages than younger ones, hence being the target of opportunistic behavior on the side of employers (Mercat-Bruns, Holt, Kutz, 2016), which is the kind of behavior that antidiscrimination laws prevent. Similarly, they can be excluded from on-the-job and other forms of training that might be reserved to younger workers, who are seen as a worthier long-term investment (Adams, 2002; Cohn, 1982; Maxwell, 1989; O'Rand and MacLean, 1986).

Age is, of course, a matter of culture too, that can be interpreted in many ways: the question "how old are you?" has only one answer, but many possible interpretations (Mercat-

[3] This chapter was written in collaboration with Prof. Cinzia Meraviglia (University of Milan)
The authors express their gratitude to Prof. Raffaele Guetto (University of Florence) for his very useful suggestions on the difference-in-difference models.

Bruns et al., 2016), all susceptible of leading to different conducts on the side of employers, co-workers, and the workers themselves. In this light, the nature of age as a basis for discrimination stands out against that of gender and ethnicity: age

> "marks a stage that each of us will reach if we live out our normal span" (Massachusetts Board of Retirement v. Murgia, 427 US 307, 1976).

In other words, if age is an ascribed factor, just as gender or ethnicity, unlike the latter it is bound to change over life, making it more complex to design regulations and policies that aim at protecting some age groups from discrimination. Furthermore, age is both an indicator of personal characteristics and a marker that places the individual within a social and historical frame, i.e. a generation (Mercat-Bruns et al., 2016). Actually, analysts speak of period, age and cohort effects as all being indexed by age (Firebaugh, 1997). The first refers to the historical period and the kind of changes that it brings about; the second refers to the meaning we usually associate to age, namely the life-cycle status one individual is in, while the third concerns the specificity of a given cohort. For example, a period effect is when empirical research shows that age discrimination becomes more likely the more our societies age, which is a process that started a few decades ago and that is bound to continue in the near future (Lozon, Barratt, 2013; Rippon et al., 2013). A life-cycle effect is when a worker is fired because of his/her older age, which demands a higher pay than in the case of a younger worker. Finally, a cohort effect is found when a cohort of older workers experiences termination, job displacement or involuntary exit from the labor market more often than both older and younger cohorts.

Another aspect of age being a cultural factor – despite being an apparently "objective" characteristic – is underlined by some studies that point at the fact that culture in Western contemporary societies promotes "young" as being better than "old" (Wood et al., 2008); this idea becomes part of our everyday life through socialization, shaping everyday life interactions in organizations and institutions (Coupland, Coupland, Giles, 1991; Levy, Banaji, Nelson, 2002; Schrank, Waring, 1989), including the labor market.

It could be argued that, in spite of the positive image of being young and negative of being old, young workers still end at a disadvantage in the labour market, i.e. face problems finding jobs. The issue here is that the explanations behind them coming across such problems is often linked to non-discriminatory factors. Studies on this topic show that troubles finding employment for young workers happen due to mismatch between the knowledge they gained when studying and the demands that employers have (e.g. Barbulescu, 2012; Refrigeri, Aleandri, 2013; Gontkovičová, Mihalčová, Pružinský, 2015). These kinds of problems could be solved by

a better dialogue between educational institutions and firms, i.e. the adjustment of study programs in line with the demands of the labour market or by additional training of young graduates. This would be more complicated with older workers as they are often regarded as too old and not motivated enough to get any new training (Riach, Rich, 2007, p. 3). In this sense, younger workers have more possibilities to gain necessary training and/or experience that will fit better in the market as they are likely to face less prejudice and less obstacles based on it.

Apart from that, the issue of age discrimination against older workers is a bit more pressing due to demographic issues. Firstly, population in ageing quickly, quicker than before. This happens in the form of longer life-expectancy, lower fertility rates and, as a consequential result, higher share of older people and higher dependency ratios. For example, life expectancy at birth in OECD countries is now 80 and more, which is 10 years more that it was in 1960s (OECD, 2018). Life expectancy at 65 is now 21.3 years for women and 18.2 for years men, and it is expected to increase to 25.5 years and 22.8 years respectively by 2060s (OECD, 2017, p. 120). Fertility rates, on the other hand, have decreased from 2.7 in 1970 to 1.7 in 2014 (OECD, 2016, p. 81). Additionally, according to the World Health Organization (2018) in the next 30-35 years the share of the population over 60 years old will be almost twice what it is now (from 12% in 2015 to 22% in 2050). Moreover, by 2020 there will be more people aged 60 than children younger than 5 years old.

This means that in the upcoming decades the issues of elderly people will be among the important issues for the societies. This will include the position of older workers in the labour market, as the increase in life-expectancy leads most of the countries to increase retirement age, thus, increasing the share of older workers in the labour market (OECD, 2017).

European countries (as compared to, for example, the USA) addressed age discrimination in the labour marker only recently. If the USA legislation started to cover this problem about five-six decades ago, in Europe this happened only in 2000; before that, almost all European Union (EU) countries (aside from Poland and Finland) did not prohibit discrimination based on age (Kapp, 2013). In 2000, the Framework Directive on Equal Treatment in Employment and Occupation (Council Directive 2000/78/EC, 2000) concerning various forms of discrimination, including age, was issued, with EU countries having to adopt it by December 2003, with possible extensions for age and disability (Arrowsmith, 2004).

As of 2000, in Italy there was no specific legislation against age discrimination, aside from Article 37 of the Constitution about juvenile workers having to receive equal pay as other workers (Arrowsmith, 2004). Hence, there was no legislation protecting older workers from discrimination in the labour market when this Directive was implemented, in 2003. Actually, the scant empirical research on age discrimination around this time shows that older workers did

experience certain discriminatory treatment in the past (Segalla, Jacobs-Belschak, Muller, 2001; Rymkevitch, Villosio, 2007; Lazazzara, Bombelli, 2011). For example, in 2006, 72% of workers belonging to a 45-54 age group reported encountering age discrimination, according to the 2006 Kelly Global Workforce Index. However, the survey conducted in Italy by Institute for the Development of Vocational Training of Workers (ISFOL) placed Italy among the countries with the lowest level of discrimination in the workplace. Still, in a research conducted in 2002, age discrimination was first in ranking (7.5% of respondents encountered it), among other forms of discrimination (political opinion, 5.5%, and gender, 4,9%). Older people reported having been discriminated more frequently than younger people (Rymkevitch, Villosio, 2007, p. 4). Moreover, Paulli and Tagliabue (2002) stated that older workers faced particular discrimination in what concerned job recruitment and training courses, especially with the low-skilled types of work (by Rymkevitch, Villosio, 2007, p. 5). The same is confirmed by Lazazzara and Bombelli (2011, p. 814), who maintain that human resource management made little investment in older workers and created obstacles in promotion for workers 45 years old and above. Additionally, according to Rymkevitch and Villosio (2007, p. 6), among 5189 advertisements in the 1993-2004 time period, more than 40% included age requirements, and more than 85% of them required candidates less than 44 years old. Older workers were also the first ones to become redundant in case of restructuring (Segalla, Jacobs-Belschak, Muller, 2001).

Moreover, in Italy there are no requirements to stop working after reaching retirement age for private sector workers, but it exists for public sector workers. According to some researchers,

> "the use of age-based stereotypes has never been perceived as being potentially discriminatory" (Guaglianone, Ravelli, 2015, p. 175).

In addition to that employers are allowed to dismiss the workers who have reached retirement age without any justification (Guaglianone, Ravelli, 2017, p. 120).

When discussing the implementation of Council Directive 2000/78/EC in Italy, Rymkevitch and Villosio (2007, p. 18) claim that, in spite of its formal introduction, the consolidated anti-discrimination approach is still lacking. In this paper, we will conduct some analyses to ascertain whether the Directive, however, had served its purpose and had any influence on the employment rate of older workers.

# 1. Elderly workers in the Italian labour market

Italy, as many other countries, faces the fact that its population is ageing. As it can be seen in Figure 1, in 2015 the percentage of people aged 55 and above was 35,5%, as compared to

21,7% in 1975. Hence, we can see that it has increased more than 1,5 times during the period and it is expected to continue increasing, up to almost 46% in 2050. The same increase concerns the share of people aged over 65 (i.e. those who are nearest to retirement), which is expected to increase from 22.4% in 2015 to 34.6 % in 2050. In addition to that, Figure 1 shows that the dependency ratio has increased as well, and it is expected by 2050 to get to twice as much as it was in 2015. This dependency ratio is a pressure in itself on the working population. If discrimination of older workers is added to it, the situation is expected to become even more difficult for discriminated workers, for retirees and for younger people in employment.

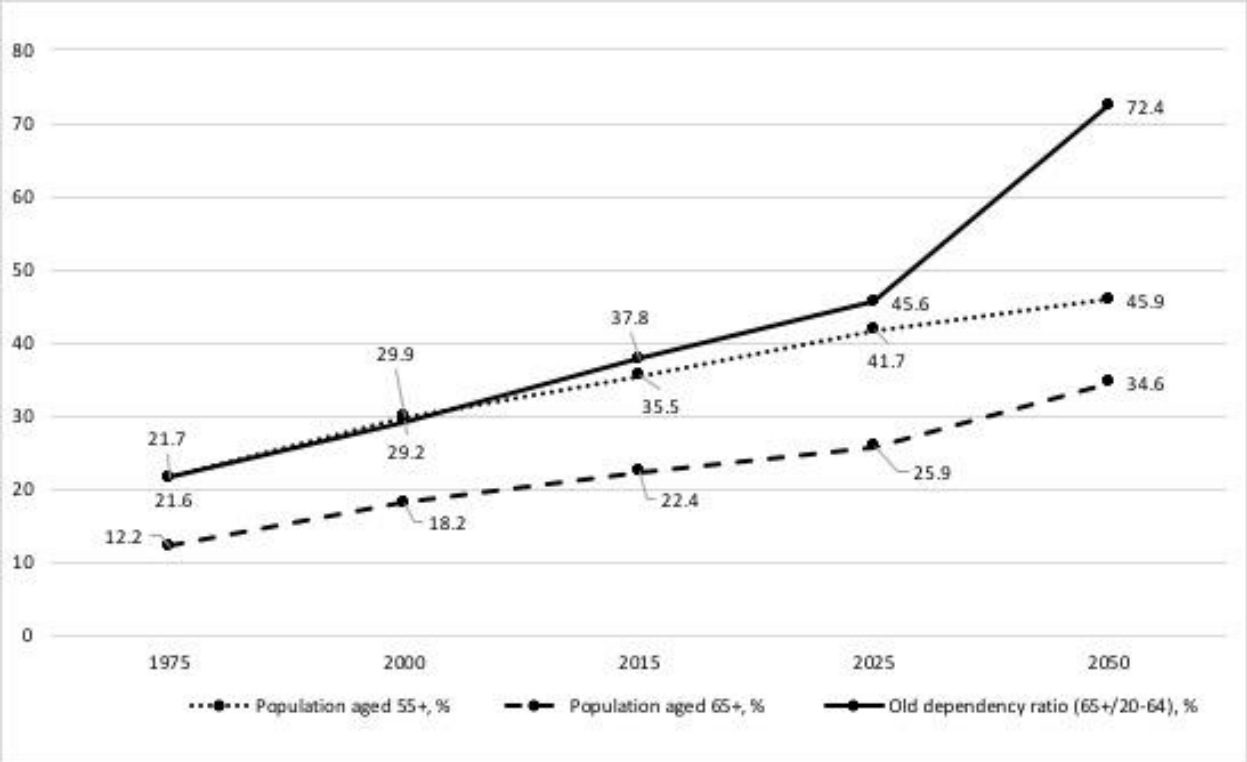


**Figure 1 — Elderly population in Italy, 1975-2050 (projections for 2025 and 2050)**

Sources: OECD, 2017; Eurostat, 2017; United Nations, 2017; Author's calculations

Table 2 shows some retirement statistics on Italy. The pensionable age has now become rather high, and it will continue increasing up to 70 years old, until 2050 (Pensionioggi.it). It should, however, also be noted that the average effective retirement age in Italy, currently, is remarkably lower than the official pensionable age, and while people have quite a high life expectancy, they spend a lot of time in retirement which, as was said above, increases the dependency ratio and, thus, the pressure on employed population. Therefore, it is important for older people who have not reached retirement age yet to stay in employment. However, early retirement is quite popular in Italy, employers often encourage older workers to retire early and are more prone to dismiss them on the grounds that they will retire soon anyway (e.g., Segalla et al., 2001; Lazazzara, Bombelli, 2011).

**Table 2 – The elderly in the Italian pension system**

| | |
|---|---|
| Pensionable age (2018) | 66 years and 7 months |
| Change in pensionable age | 67 by 2020<br>70 by 2050 |
| Average effective retirement age (2016) | Men – 62,1<br>Women – 61,3 |
| Early retirement (2018) | Men —42 years and 10 months<br>Women — 41 years and 10 months |
| Life expectancy at birth (2015-2020) | Men – 81,1<br>Women – 85,4 |
| Life expectancy at 65 (2015-2020) | Men – 19.5<br>Women – 22,4 |
| Life expectancy at 65 (2060-2065) | Men — 23.9<br>Women — 26.9 |

Sources: Pensionioggi.it; OECD, 2017 ; ISTAT, 2018

Due to the alarming dependency ratio forecasts, the issue of elderly workers staying in employment longer is important. Table 3 shows the employment situation in Italy in 2004 and 2017. As we can see, the employment rates in all age groups aside from the youngest (15-24 years old) have been in 2004 and still are now higher than in the oldest group (55-64 years old). However, we can also see that employment rates in all groups aside from the oldest one have decreased. The decrease was slight for the middle-aged (35-44 and 45-54 age groups) and remarkable for the younger groups (15-24 years old).

**Table 3 — Employment, unemployment and inactivity rates in Italy by age cohorts (2004 and 2017), %**

| | 15-24 | | 25-34 | | 35-44 | | 45-54 | | 55-64 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 2004 | 2017 | 2004 | 2017 | 2004 | 2017 | 2004 | 2017 | 2004 | 2017 |
| Employment rate | 27.3 | 17.1 | 70.0 | 61.3 | 76.4 | 73.1 | 69.9 | 71.7 | 30.6 | 52.2 |
| Unemployment rate | 23.5 | 34.7 | 10.3 | 17.0 | 5.7 | 9.7 | 4.1 | 7.9 | 4.2 | 5.8 |
| Inactivity rate | 64.3 | 73.8 | 22.0 | 26.2 | 18.0 | 19.0 | 27.2 | 22.1 | 68.1 | 44.6 |
| Changes in employment rates | - 37.2 | | -12.5 | | -4.4 | | -2.6 | | +70.5 | |

Source: Istat, 2018; Author's calculations

We will discuss the youngest and the oldest cohorts in a more detailed way, as they faced the most significant changes.

According to Istat, people are considered to be in the "elderly" age group from 55 years of age, while the "youth" age group goes from 15 to 34 years. As we can see in Table 3, almost half of the population aged between 55 and 64 was inactive in 2017, but this percentage is much lower than in 2004. Additionally, the employment rate of older workers has increased considerably in the last 13 years, by 70.5. The unemployment rate is rather low (5.5%); this could be due to the fact that, starting from a certain age, people become inactive after losing their job (even if they cannot officially retire yet), or they possibly go on early retirement, as it is too hard to find a job if a person has been made redundant close to retirement age (Lazazzara, Bombelli, 2011).

Regarding younger workers, we can see that the highest unemployment rate is in the youngest cohort (15-24 years), when people are fresh from school and do not possess a lot of working skills, which makes it hard for them to find a job. As for the employment rate (Table 3), workers aged 25-34 have a higher level of employment than as those aged 55-64 (61.3 vs. 52.2), even if the level of employment of the younger group has slightly decreased since 2004. The unemployment rate of the youngest group of workers is considerably higher, mainly due to the 2008-2009 crisis (Tanveer Choudhry, Marelli, Signorelli, 2012) and labour market flexibilization (Barbieri, Scherer, 2009).

As for the older workers, the questions are: what has brought about this increase in employment, either the increase in the retirement age, the effectiveness of anti-discriminatory legislation, or both? And to what extent has either factor pushed the employment rate?

# 2. Policies targeting older workers and their evaluation

In the above section, we have shown that the employment rate of older workers has considerably increased since 2004. Judging by the legislation changes that happened in Italy since then, there could be two possible reasons behind this fact.

The first one refers to the two new legislations that influenced older workers in 2003-2004. In June 2003 the Council Directive 2000/78/EC was adopted, which aimed at decreasing age discrimination by directly prohibiting age discrimination in the labour market, that we already cited. The second one concerns the pension reform (Legge 23 agosto 2004, n. 243) that was issued in September 2004, announcing a gradual upward shift of retirement age, from 57 to 60 in 2008, to 61 in 2010 and to 62 in 2014.

Obviously, an increase in retirement age leads to an increased share of older people in the labour market, hence definitely influencing the employment status of older people. Similarly, the introduction of the anti-discriminatory legislation, if it had achieved its aims, should have had a positive influence on the employment prospects of older workers, while not influencing the

employment prospects of those age groups (possibly excluding the younger ones) that were not targets of this legislation.

Evaluating the impact of a policy amounts to entering the domain of causality and that of its empirical assessment. Of course, causality is an old and debated issue in statistics, philosophy and in the social sciences (see for example Goldthorpe, 2007). To be strict, the only way of assessing whether a causal factor is at work lays within the counterfactual approach[4], which requires to observe the outcome *Y* on unit *i* both when the unit has been exposed to treatment *t* ($Y_t$) and not exposed to the treatment itself ($Y_c$); the difference between the two outcomes ($Y_t - Y_c$) is the realized causal effect of the treatment. Clearly, this is impossible to observe[5]. Holland (1986) defines this as the fundamental problem of causal inference, that potentially blocks all ways to empirically ascertaining causality at work. Scholars have then devised a number of methods for bypassing this impasse, depending on which domain a researcher is in – either experimental research, or observational, nonexperimental research. The latter field is more challenging, since the researcher has no possibility to define and select *ex ante* the control and the treatment groups on the basis of randomization – one of the key requirements for bypassing the fundamental problem of causal inference, together with the unit homogeneity assumption[6] and the Stable Unit Treatment Value Assumption (SUTVA; Rubin 1986; Morgan, Winship, 2014).

Matching is one of these techniques, used in nonexperimental studies, in which there is a well-defined treatment group exposed to treatment, but no specific experimental design is used to form a control group (e.g., Bassi, 1984; Czajka et al., 1992; Dehejia, S Wahba, 2002). As King and Nielsen put it,

> "the goal of matching is to reduce imbalance in the empirical distribution of the pre-treatment confounders between the treated and control groups" (2016, p.1),

so to get closer to an experimental framework.

There are several matching methods that can be used to analyze policy effects, such as propensity score marching (PSM; Rosenbaum, Rubin, 1983), synthetic control method (Abadie, Diamond, Hainmueller, 2015), coarsened exact matching (CEM; Blackwell, Iacus, King, Porro, 2009). However popular these methods have been, the literature has highlighted their biases and

[4] See among others: Winship, Morgan, 1999; Morgan, Winship, 2014; Holland 1986; Holland, Rubin 1983.
[5] A very simple approach to evaluating the impact of a given policy is represented by logistic regression, through which it is possible to assess, for example, whether the targets of the policy at hand are better off than nontargets in a given time period – should be excluded, since it produces more biased results than other methods (e.g., Cepeda et al., 2003).
[6] For an introduction to the requirements of experimental and nonexperimental research, see King, Keohane, Verba, (1994).

warned against their application in a causal inference setting. For example, King and Nielsen claim that PSM – as a matching technique – leads to

> "unnecessary imbalance, which generates model dependence, researcher discretion, and statistical bias" (2016, p. 2).

In sum, PSM ends up re-introducing in the data the biases it aimed at minimizing.

Still part of the counterfactual framework, the difference-in-differences (DID) approach offers some advantages over competing techniques. Being a quasi-experimental method, it is useful when exchangeability between the treatment and control groups cannot be assumed, hence when randomization is not possible. While propensity score matching pairs treatment and control units that are

> "similar in terms of their observable characteristics" (Dehejia, Wahba, 2002, p. 151),

the main point of using the DID approach is when the average outcomes of treatment and control groups follow a parallel trend before a given time point, then diverge afterwards (O'Neill et al., 2016, p. 1). While other matching techniques provide less biased results when parallel trend assumption does not hold, DID presents unbiased results when it does (O'Neill et al., 2016, p. 11), especially if applied symmetrically (Chabé-Ferret, 2015, p. 110), i.e. when there is an equal number of time periods before and after the treatment.

In our case, we have a particular age group – that of older workers – who was targeted by the anti-discriminatory legislation (as well as by the increase of retirement age). A suitable treatment group to contrast older workers against is that of middle-age workers, who were not targets of the anti-discriminatory policy, as they were not at risk of age discrimination yet. At the same time, they are far enough from retirement to not be influenced by the increase of retirement age over the upcoming years.

We will also distinguish between cumulative effect of both the EU legislation against age discrimination and the increase of pensionable age, while aiming at assessing the specific effect of the anti-discriminatory legislation.

# 3. Research questions and hypotheses

The employment status of older workers is a suitable indicator of any eventual effect of the anti-discrimination policy. As we discussed in the Introduction, older workers are more at risk of termination the closer they get to standard retirement age and find it more difficult to find a new job, once fired (Lazazzara, Bombelli, 2011). Hence, should we observe an increased share

of older workers among the employed after 2003, there could be grounds to claim that the anti-discriminatory legislation actually had its intended effect.

At the same time, as we anticipated in the previous Section, a confounding effect could come from the increase of pensionable age in force since 2004: of course, such measure has the effect of keeping older workers in the labour market – hence potentially increasing the risk of them being the target of discrimination on the basis of age, as well as the probability for them to be employed instead than inactive.

In order to disentangle these matters, we will consider the employment probability of a cohort of older workers and contrast it against that of two different groups: that of workers who are either unemployed or inactive (thus including the normally retired); and that of workers who are unemployed or inactive, excluding the normally retired. We will come back to this strategy of analysis in the next Section.

Our main research questions are the following:

1. Did the probability to be employed rather than either unemployed or inactive of elderly workers increase after the year 2003?
2. Could this increase be attributed to the implementation of the Council Directive 2000/78/EC, which prohibits age discrimination, or is it only the result of the pensions system reform in 2004, which increased retirement age?

Our main hypothesis is based on the assumption that, as the anti-discriminatory legislation is aimed at improving the situation of those who belong to the risk groups, its introduction should do exactly this. In the case of age discrimination in the labour market, employers should start acting in accordance with the laws, e.g. stop pressuring older workers to retire early or firing them without any legitimate explanation.

Thus, our hypotheses are the following:

1. The probability of older workers (55-59 years old) of being employed rather than either unemployed or inactive increased after 2003, as compared to before, and in contrast with that of younger workers.
2. This increase is due to the implementation of the Council Directive 2000/78/EC, which prohibits age discrimination, instead than to the 2004 pension reform.

# 4. Data and method

In our analysis we use the European Union Labour Force Survey (EU-LFS) cross-sectional data for Italy from 1992 to 2016. The policy was introduced in Italy in 2003 and, thus, there is enough data to look at the outcome before and after 2003.

We will run two models (see Table 5) having employment status as their outcome. The probability to be employed is calculated as the ratio of everyone employed to all employed, unemployed and inactive, with two specifications. The first one concerns permanently disabled people and those in military service, who have been excluded from the inactive population in our first model. The logic behind this is that disabled people are (often) permanently inactive, regardless of the policies introduced and, thus, cannot represent an alternative outcome to being employed[7]. Similarly, those in military service are highly unlikely to be of the age groups that concern us and, thus, it is preferable to exclude all cases belonging to this category. Also, being in military service was compulsory only until 2004, and configures an employment status that is hardly comparable to unemployment or inactivity, that can be both related to the labour market instead than to formal regulations.

However, we keep in the group of the inactive the students, as this category is vast and includes those in further training and having an unpaid work experience, thus making it possible for respondents in the studied age groups to be among them. We also keep in those who are fulfilling domestic tasks, as it is totally possible that among them there are older people who are not working due to inability to find a job, and those in retirement and early retirement, as these are categories in which those who were forced into retirement may be, as well as those from younger cohorts, especially women, who can get back to employment after an inactivity spell.

Since the year 2004 (very close in time to the introduction of the anti-discriminatory legislation in 2003) was also marked by the Maroni pension system reform, which increased retirement age, we should make sure that the effects that we might be finding are the results of the anti-discriminatory policy introduction and not of the changes in the retirement age. For this purpose, in our second model we remove the normally retired from the inactive group, against which the employed among the selected age group will be contrasted, as shown in Table 4.

**Table 4 — Composition of the contrasted groups by models and sampling frame**

| Model | Outcome | Contrasted groups | Sampling frame |
|---|---|---|---|
| 1 | Employment status | Employed vs. Unemployed + Inactive (without disabled and those in military service) | Active individuals in the sample 1992-2016 |
| 2 | Employment status | Employed vs. Unemployed + Inactive (without disabled, those in military service and normally retired) | |

[7] Of course, a worker – regardless of her/his age, might turn disabled while in the labour market, and/or can enter or leave the active population depending on her/his condition. What we are saying here is that on average the reason behind an older worker leaving the labor market is more often related to becoming unemployed or retired, than disabled, and for this reason the latter category is excluded from the contrast group.

**Table 5 — Design of the DID quasi-experiment**

| | 55-59 age cohort (T) | 35-39 age cohort (C) | Difference (T-C) | Difference-in-difference |
|---|---|---|---|---|
| Before 2003 | $P_1(T)$ | $P_1(C)$ | $\Delta P_1 = P_1(T) - P_1(C)$ | $\Delta P = \Delta P_1 - \Delta P_2$ |
| After 2003 | $P_2(T)$ | $P_2(C)$ | $\Delta P_2 = P_2(T) - P_2(C)$ | |

The DID design typically needs two groups to be compared before and after the treatment, i.e. the passing of the anti-discrimination law, as for an outcome measure, in our case the probability of being employed rather than unemployed or inactive. The design of the contrasts is detailed in Table 5.

Hence, the probability of being employed rather than unemployed or inactive of older workers (55-59 years old) will be observed before and after 2003 and contrasted against that of workers in the age cohort of 35-39.

These two age cohorts were chosen because we needed to compare those who are at the lowest risk of getting discriminated, due to their age, and those who were at the highest risk. Thus, the age cohort of 35-39 years old seemed to be the most suited reference group. While the age at which people start their professional path varies with time, in the past starting earlier and in the recent years continuing to their education for longer, 35-39 years old is a safe age for long time periods. At this age, one is either a professional with status or, at the very least, someone who is past his/her first years of work. Also, according to Istat, people aged 35 and more no longer belong to "youth", which makes them the age group that is typically not the target of anti-discriminatory legislation.

Although, according to the literature, for a long time the ideal age at which it made sense to look for signs of discrimination was 45 years old (Kalish, Williams, 1983), in Italy those aged between 40 and 50 have, on average, have the highest employment rates, hence making it pointless to choose them as our treatment group. Instead, we needed a group that showed a certain decline in employment levels and that is moving towards retirement age, as this is the age at which discrimination should be more prominent and, thus, easier to catch. In this sense, the group aged 55-59 seems a perfect choice. From this age on, according to Istat, people start to belong to the "elderly"; the age cohorts before are very well employed and the age cohorts after (60 and older) are a lot closer to retirement, with inactivity rate relatively high. Indeed, as we showed above, in 2003 the retirement age was below 60 (starting to increase from 57 to 60 by 2008 and to 62 by 2014). Thus, most of those from the age group 60+ were already in retirement. Under these conditions, the results could be biased by such things as voluntary unemployment and/or inactivity that is not connected to discrimination. This is why chose 55-59 age group.

Most of the members of this age group were close to retirement at that point but not expected to be normally retired yet. Thus, exactly the group we needed. Figure 2 shows the share of employed workers on both the unemployed and inactive in our data (with the exception of those in military service and the permanently disabled, as we explained).

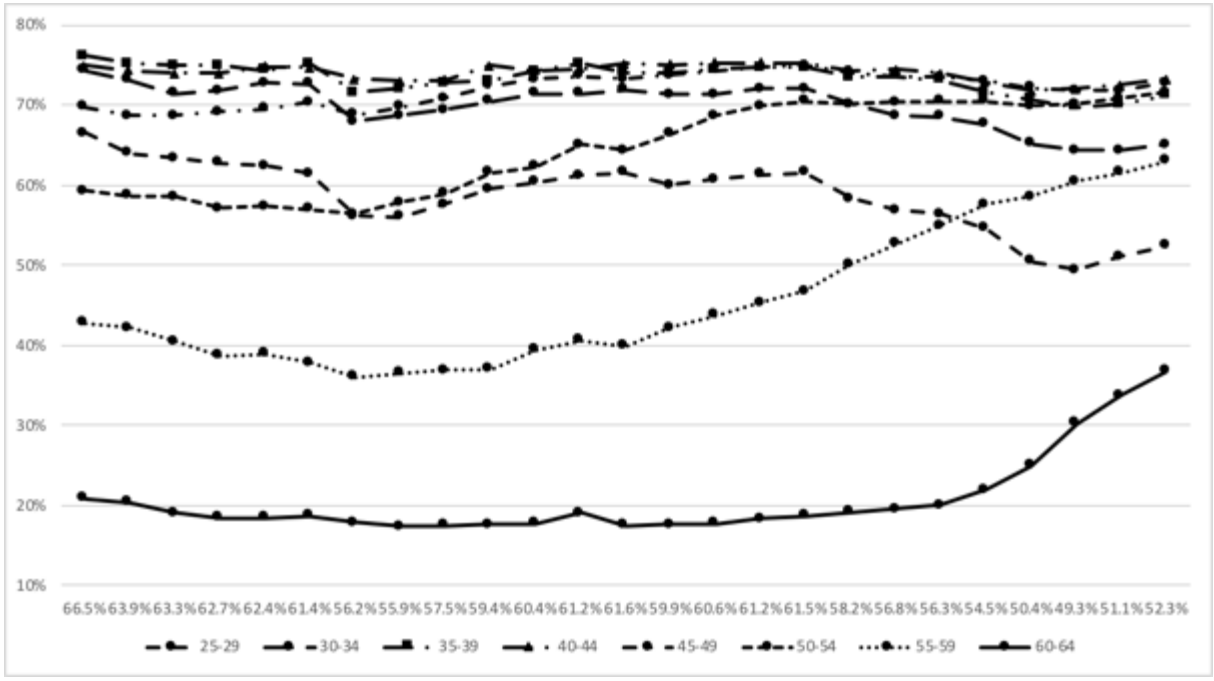


**Figure 2 — Share of employed workers by 5-year wide age groups, 1992-2016 (EU LFS)**

In our models we control for a list of factors that we consider important for the situation in the labour market. These are gender, education level, training undertaken in the last four weeks, year of survey, sector of activity (current for those employed, and the last one for those unemployed or inactive), ISCO-88 code of the occupation (1-digit) and macroregion of residence (see

Table 6 for details).

Finally, it is to be mentioned that we ran a DID analysis for each of three different time periods. The first one is the entire period for which we have available data, i.e., 1992-2016. The second period goes from 1999 to 2007, hence still including 2003 as a middle point but being shorter than the previous time specification. We choose 2007 because the crisis of 2008-2009 has significantly influenced employment prospects of all age groups and, thus, the inclusion of this period and the years after it might distort the results. By right-censoring our data to 2007, then, we aim at checking whether the results obtained on the longest time span are possibly biased by the crisis as an external shock that could interfere with the effect of the policy under study. Finally, we restricted the analysis to the period for which we have the strongest proof of

the parallel trend, both visually and analytically, and for both models (with or without the normally retired), i.e. from 2002 to 2004. In all these cases, we selected the years of survey so to have a symmetrical time span before and after the year 2003.

**Table 6 — Variables in the models**

| Variable | Measurement | Number of categories | Description of categories |
|---|---|---|---|
| Age groups | Binary | 2 | 35-39 and 55-59 age groups |
| Gender | Binary | 2 | Male, Female |
| Educational level | Categorical | 3 | Low, Medium, High |
| Sector of activity of current / last job | Categorical | 3 | Agriculture, Industry, Services |
| Current/ last occupation | Categorical | 10 | ISCO-88 code, 1 digit (Legislators, senior officials and managers; Professionals; Technicians and associate professionals; Clerks; Service workers and shop and market sales workers; Skilled agricultural and fishery workers; Craft and related trades workers; Plant and machine operators and assemblers; Elementary occupations) |
| Macroregion | Categorical | 5 | North-West, North-East, Center, South, Islands |
| Training or education in the last 4 weeks | Binary | 2 | Yes, No |
| Year of survey | Categorical[8] | 27 | 1992-2016 |

The whole sample for the period under study consists of 10288352 cases from which we, obviously, removed everyone who is not in the right age range (8900285 cases). After this selection, we were left with 1388067 cases. Then we removed cases that did not belong to the categories of interest as for the outcome variable (employed/unemployed/inactive minus those in military service and permanently disabled for Model 1; all the above minus those in normal retirement for Model 2).

This left us with 1061561 cases (Model 1) and 984226 cases (Model 2). We then removed cases that lacked information on education and training, sector of activity and ISCO-88 code. As for ISCO-88, we also removed the army professions, as the military is a very specific type of career that works in a different way from ordinary occupations. Thus, we removed them to avoid any potential bias[9].

[8] We take year as a categorical variable as per DID method we will need to analysis the interaction between the year of survey and treatment group which we will discuss in the upcoming sections.
[9] Table 17 and Table 18 in the Appendix show the details of the selection procedures that led to the valid sample.

# 5. Descriptive statistics

Here we will present the descriptive analysis of the variables used in this study by both age cohorts and time for Model 1 (which includes the normally retired among the inactive) and Model 2 (which excludes them) in order to see whether there are any remarkable and/or unexpected differences between the Models and/or time periods and/or age groups that could distort the results of our study of the role of legislation.

As we can see in Figure 12 to Figure 15 and in Table 19 in the Appendix 2, the distribution of gender is slightly less balanced in the older cohort, which points at the fact that women entered the labor market less often in those cohort, and/or that they already left it by the age of 55. For both age cohorts in Model 1 and over time, there is the same tendency of convergence towards a 50:50 distribution: from 40.4% females and 59.6% males in 1992 to 47.7% and 52.3% respectively in 2016 for 35-39 age cohort; from 33.0% females and 67.0% males in 1992 to 45.2% and 54.8% in 2016 for 55-59 age cohort.

The same holds for Model 2: there were 29.2% of females and 70.8% males in 1992, while in 2016 there were 45.2% of females and 54.8% females. The change is more prominent for the older than for the younger cohort. While the share of women in the labour force in the past has always been lower than that of men (since a high share of them stays or quickly becomes housewives) and has been increasing with time, in the past this effect was amplified by lower retirement age. In 1990s a high percentage of them would already be in retirement at the age of 55-59. However, with the retirement age increase, the number of women at this age in the labour market also increased. This could explain why the increased share of women in Model 2 for the older cohort is sharper in the 1990s and becomes more gradual with time than in Model 1: removing the normally retired had a higher impact on gender distribution as compared to when retirement age was lower.

In terms of education (Figure 16 to Figure 19; Table 20 and Table 21 in the Appendix 2), including or excluding the normally retired makes little difference. In fact, in both models the level of education tends to increase with time for both age cohorts, i.e. the share of those with only lower secondary education tends to decrease and the share of those with upper secondary and tertiary education tends to increase. As expected, in both models the level of education is higher for the younger cohort than for the older. There were around 50% of the work force with lower secondary education in the younger cohort and around 80% in the older cohort in 1992; around 37% against around 14% respectively with upper secondary education and around 12% against 5-6% respectively with tertiary education. In 2016, these figures were less than 29% (lower secondary), approximately 48% (upper secondary) and almost 24% (tertiary) for the younger cohort, against approximately 42-43%, 42-43% and 14-15% respectively for the older

cohort. This is consistent with the fact that the share of people with higher education tends to increase with time.

Figure 20 to Figure 23 and Table 22 in Appendix 2 show that there is no big difference across models in terms of additional training over the last four weeks. We can, however, see that the share of those who did have training increases over time (from less than 1% in the older cohort and about 2% in the younger cohort in 1992, to 7.2% in the older cohort to 8.2% in the younger cohort in 2016). We can also see that the difference between the younger and the older cohorts has decreased over time.

When macroregions are considered (Figure 24 to Figure 27; Table 23 and Table 24 in Appendix 2), there is no remarkable difference neither between age cohorts nor across models. The only difference that is worth mentioning is that gradual decrease of the share of the Southern macroregion (from approximately 24-26% depending on the cohort and model to 19-20%) in the sample. The share of North-West in the sample has, at same time, increased by 3-4 percentage points. The shares of other regions have stayed relatively stable.

As for the occupation (Figure 28 to Figure 35; Table 25 Table 28 in Appendix 2), in Model 1 we can see that on the 35-39 age cohort the share of legislators, senior officials and managers saw a 5-timed increase (from 2.2% to 10.9%)[10]. The share of professionals went from a temporary decrease (13.0% in 1992 to 8.3% in 2006) to a return to the same level (to 13.5% in 2016). The share of technicians, on the other hand, faced a temporary decrease (from 14.8% in 1992 to 22% in 2007) that was followed by the decrease to the same level as in the beginning of the studied period (14.6% in 2016). The share of clerks (between 10% and 14%), plant and machine operators (between 8 and 10%), and elementary occupations (between 10 and 13%) stayed relatively stable through the period. Service workers saw a slight increase (from 14.7% in 1992 to 17.5% in 2003) that was followed by gradual decrease to less than 10% in 2011; and a slow but steady increase since then (up to 11.4% in 2016). The share of service workers also decreased slightly from 18.9% to 14.4%. The share of agricultural workers has decreased from 3.6% in 1992 to 1.9% in 2016. The same tendencies are true for the Model 2.

As for the older cohort, for the Model 1, we can see that the share of legislators has increase more than 3 times (from 3.0% in 1992 to 9.5% in 2016). The share of professionals saw a steady decrease from 6.2% in 1992 to 13.8% in 2016. The share of technicians, similarly to the

[10] It should be mentioned that in 2005 the method for calculating yearly figures in the EU-LFS database changed: until 2004, yearly results were calculated on the basis of Spring quarter information; from 2005 on, the same figures are calculated either as averages of the four quarters, or using the yearly datasets (Eurostat 2016). However, the major reason behind the sometimes abrupt changes in the figures before/after 2004 is that in that year Istat restructured the Labor Force Survey to meet the Eurostat requirement. Hence – while these changes do not affect the way in which the main indicators of the labour market are calculated, such as employment or unemployment rates – finer comparisons before/after 2004 might result in unexpected outcomes, as in the case of Isco-88 major group 1.

younger cohort, saw an increase from 7.4% in 1992 to 18.9% in 2008 which was followed by a decrease to 14.6% in 2016. The clerks experienced an increase from 8.3% to 14.2% through the period. Service workers faced a steady decrease (from 15.3% in 1992 to 6.7% in 2005) that was then followed by a steady increase up to 10.4% in 2016. The share of agricultural workers has decreased more than thrice (from 11.1% in 1992 to 3.0% in 201). The similar happened to crafts workers (from 20.3% to 13.0%). The shares of plant workers (10.9% to 8.1%) and elementary occupations (17.7% to 13.4%) decreased only slightly. Similar tendencies can be observed in the data used for Model 2.

In terms of the sectors of activity (Figure 36 to Figure 39; Table 29 in Appendix 2), we can see that the difference between models for the younger cohort is almost non-existent and the distribution across sectors remains stable over time. In 1992 around 7% in younger cohort was employed in agriculture, around 31% in manufacturing and around 63% in services (for both models). In 2016 these figures were 4%, around 28% and around 68% respectively. For the older group the situation is slightly different. In the past for both models they were much more often employed in agriculture (around 17%) and much less in the services (around 50%) than the younger cohort, as it can be expected from the fact that the service sector in Italy only started developing in the 80s. The share of manufacturing was practically the same (32-34% depending on the model). In 2016, those figures changed to less than 6%, more than 61% and around 25% respectively. This is consistent with the fact that the share of agricultural jobs tends to decrease and the share of jobs in services tends to increase with time.

As we can see, in terms of these variables, the difference either do not exist (between cohorts, Models or time periods) or are easily explained. There are no remarkable or unexplainable figures that could raise questions.

# 6. Results of the Difference-In-Differences analysis

## 6.1 Parallel trends analysis (Model 1)

In order to ascertain whether a crucial precondition of a DID model holds in our data (namely, the existence of parallel trends in the share of employed workers before 2003 across the two age cohorts, and a divergent trend afterwards), we will firstly perform a visual inspection of the data, then we will revert to logistic regression for confirming on a sounder statistical basis the outcome of the visual inspection itself.

As we said, the share of employed workers for each age cohort is calculated as the ratio of everyone employed to both the unemployed and the inactive. Hence, our measure differs from the employment rate, which is routinely calculated as the ratio between the employed and the remaining active population (unemployed, looking for first job). Since we are studying the anti-

discriminatory legislation aimed at those who are close to their retirement age or have recently reached it, we need to see what share of this age group is employed, including in the base also those who have already retired.

As anticipated, in order to assess whether we can compare the effect of the legislation on treatment and control groups through the DID approach, we have to determine whether there was a parallel trend between the two before the introduction of the legislation, and whether it has changed afterwards.

As we can see in Figure 3, the two lines show a rather similar trend over time before 2003, without being perfectly parallel. What is much clearer is that, after 2003, the two trends converge, with the line of the older age cohort almost reaching that of the younger cohort by 2016[11].


**Figure 3 — Share of employed workers in the treatment (55-59 years old) and control (35-39 years old) groups, %, Model 1 (with normally retired)**

As encouraging as the visual inspection can be, it is not enough for assessing beyond any doubt whether – notwithstanding the apparent, albeit not great, difference between the trend lines of the two cohorts before 2003 – the employment prospects of the two age groups were actually similar before 2003, or not. For this reason we ran a binomial logistic regression with employment status as a dependent variable (coded as 1=employed, 0=unemployed or inactive). The independent control variables are treatment group, gender, level of education, existence of

[11] It is also worth mentioning that the trend line of the 55-59 age cohort is the same before and after the removal of missing variables (see Appendix 3, Figure 40). Actually, as long as the missingness of cases is random, including or removing the cases with missing values on the relevant variables should not affect the bigger picture. Furthermore, the missingness depends not only on the outcome and on the treatment, but also on the control variables, that of course may vary according to the theory that underlies the analyses, and/or the researcher's taste.

additional training in the last four weeks, macroregion, occupation, sector of current or previous (for the unemployed and inactive) occupation and year of survey.

What we specifically look at in the parallel trend analysis, as in the DID method, is the interaction between year of survey and treatment vs. control group with the year 2003, with the control group as the reference. Were we to find that before 2003 this coefficient is not significant, it would mean – as we hope – that there was no actual difference in the trends between the two groups in the period before the introduction of the anti-discriminatory legislation. Similarly, were the coefficient to become significant after 2003, then this would mean that there was an actual change in this trend (e.g. Abadie, 2005), in line with our expectations.

As Table 7 shows[12], the interaction between treatment vs. control group and the year of survey is significant from 2004 onwards (at 1% significance level), and insignificant before that year, with the exception of year 2000, which falls slightly out from that trend (1% significance). Thus, the parallel trend that the visual inspection encouraged us to envision proves analytically for most of the period before the introduction of the legislation, while its absence is proven for all the period after 2003.

**Table 7 — Parameters of the binary logistic regression (year of survey x treatment group interaction) (Model 1, with normally retired)**

| Reference = control group, 2003 | Coefficients | Significance level |
|---|---|---|
| 1992 | 0.03 | n.s. |
| 1993 | 0.02 | n.s. |
| 1994 | -0.04 | n.s. |
| 1995 | -0.12 | n.s. |
| 1996 | -0.03 | n.s. |
| 1997 | -0.10 | n.s. |
| 1998 | -0.05 | n.s. |
| 1999 | -0.04 | n.s. |
| 2000 | -0.13 | 1% |
| 2001 | -0.10 | n.s. |
| 2002 | -0.04 | n.s. |
| 2004 | 0.40 | 1% |
| 2005 | 0.50 | 1% |
| 2006 | 0.50 | 1% |
| 2007 | 0.57 | 1% |
| 2008 | 0.65 | 1% |

[12] The entire set of coefficients of the estimated model is shown in Table 31 of Appendix 3.

| Reference = control group, 2003 | Coefficients | Significance level |
|---|---|---|
| 2009 | 0.94 | 1% |
| 2010 | 1.10 | 1% |
| 2011 | 1.25 | 1% |
| 2012 | 1.52 | 1% |
| 2013 | 1.64 | 1% |
| 2014 | 1.80 | 1% |
| 2015 | 1.86 | 1% |
| 2016 | 1.84 | 1% |

For the longest time span (1992-2016) the DID parameter (0.179) is significant at 1% (Table 8) and the probability of being employed instead than either unemployed or inactive for the control group is always higher than for the treated group (0.740 vs 0.435 before the legislation was introduced, and 0.665 vs. 0.540 afterwards) (see Table 33 and Table 34 in Appendix 4). For the period 1999-2007, the DID effect is lower than for the whole period from 1992 to 2016 (0.079), however what matters most is that it is still significant at 1% (Table 8)[13]. Finally, when we consider a very short period of time (2002-2004), the DID is still significant at 1%, though it is lower than in the previous model (0.03), both for the control and treatment groups. Nevertheless, for the treatment group, the decrease is smaller (0.021) than for the control group (0.051) which could be due to the introduction of the legislation which protected older workers rather than workers who are not of the age more at risk of discrimination (Table 37 and Table 38 in the Appendix 4).

**Table 8 — Summary of DID parameters by time span considered (Model 1)**

| | DID parameter | Std. error |
|---|---|---|
| 1992-2016 | 0.179 | 0.002 |
| 1999-2007 | 0.079 | 0.004 |
| 2002-2004 | 0.030 | 0.009 |

So far, our analysis shows that the probability of being employed (rather than either unemployed or inactive) for workers between 55 and 59 years of age increased after 2003, as compared to that of workers in the age range 35-39. This would point at a positive effect of the adoption of the EU legislation against age discrimination. However, as we previously discussed, a relevant confounding factor is represented by the increase of pensionable age that went into force from 2004 on. Hence, given the short time distance that intervenes between the two events,

[13] The detailed results of the models are shown in Table 35 and Table 36 in Appendix 4.

we should be pretty cautious in concluding at this stage that what we see is the effect of the anti-discrimination legislation, rather than of the extended permanence of workers aged 55-59 (especially women, who used to retire earlier than men) in the labour force.

In order to control for the confounding influence of the pension reform, we opted for removing all normally retired people from the valid sample, which then includes among the inactive group only those who went on early retirement – the latter event being a totally possible outcome of more or less overt discrimination of older workers close to pensionable age. This way, the evaluation of the effect of the anti-discriminatory legislation is not biased by the fact that the increase in the share of employed workers in the age range 55-59 happened simply due to the fact that people started to retire later.

## 6.2 Parallel trends analysis (Model 2)

We start our analysis with a visual inspection of the trend of employed workers in the two age groups over time, before and after 2003. The parallel trend can be seen quite well, as much as we can see it is no longer there after 2003. As with Model 1, the removal of cases due to missing values leads to a less smooth picture (for the visual representation of the trend before the removal of missing values see Appendix 3, Figure 41); however, the parallelism before 2003 and the changes after that year are still discernible.

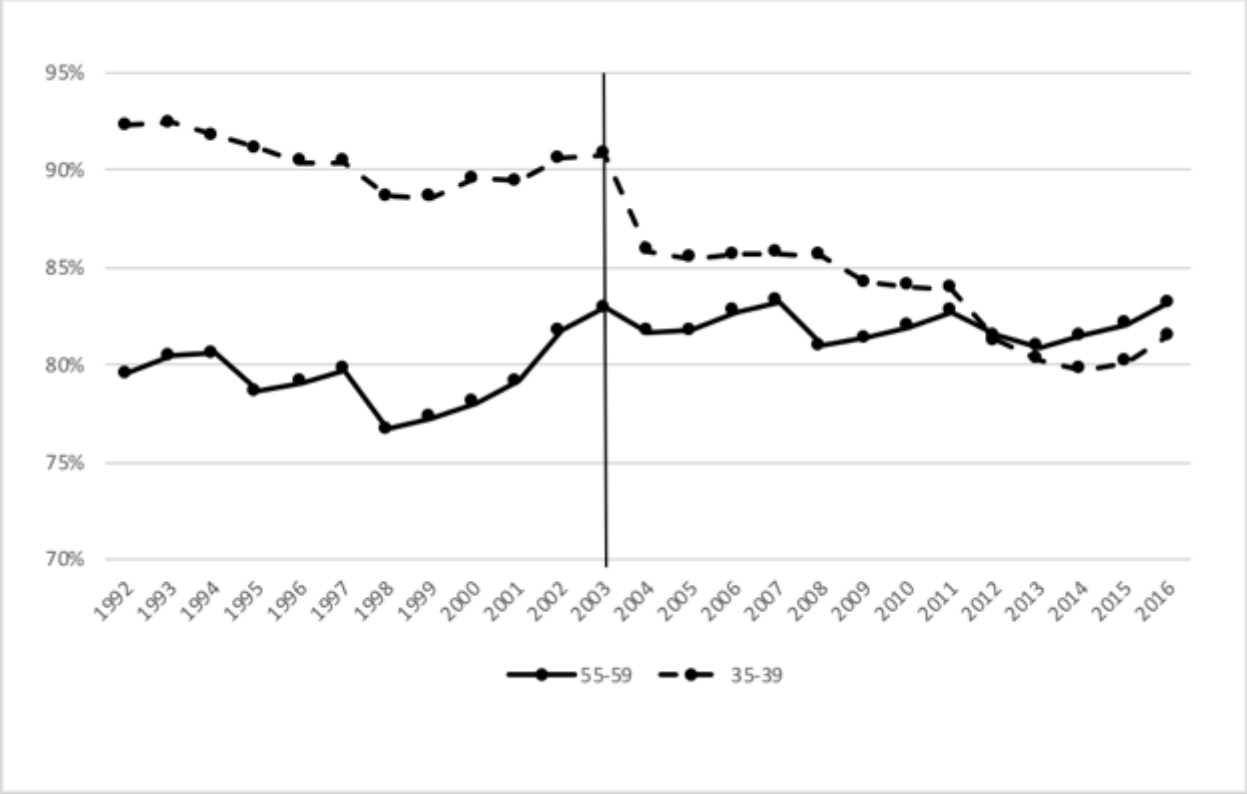


**Figure 4 — Employment rates of the treatment (55-59 years old) and control (35-39 years old) groups, %, Model 2 (without normally retired; after removal of missing variables)**

The results of the logistic regression show a weaker parallel trend than in the previous model. However, from 1996 to 2002 the parameter relative to the interaction between year of survey and the treatment variable is either insignificant or significant at 5%, while after 2003 the significance is 1% (Table 9). Hence, the parallelism between the two trend lines is weaker than in the Model 1, but still holds for a slightly shorter time span (1996-2003 instead than 1992-2003) (for the coefficients of control variables see Table 32 in the Appendix 3).

**Table 9 — Parameters of the binary logistic regression (year of survey x treatment group interaction) (Model 2, without normally retired)**

| Reference = control group, 2003 | Coefficients | Significance level |
|---|---|---|
| 1992 | -0.39 | 1% |
| 1993 | -0.33 | 1% |
| 1994 | -0.22 | 1% |
| 1995 | -0.30 | 1% |
| 1996 | -0.18 | 5% |
| 1997 | -0.10 | n.s. |
| 1998 | -0.14 | n.s. |
| 1999 | -0.13 | n.s. |
| 2000 | -0.18 | 5% |
| 2001 | -0.13 | 5% |
| 2002 | -0.04 | n.s. |
| 2004 | 0.38 | 1% |
| 2005 | 0.40 | 1% |
| 2006 | 0.42 | 1% |
| 2007 | 0.46 | 1% |
| 2008 | 0.29 | 1% |
| 2009 | 0.43 | 1% |
| 2010 | 0.50 | 1% |
| 2011 | 0.58 | 1% |
| 2012 | 0.68 | 1% |
| 2013 | 0.72 | 1% |
| 2014 | 0.82 | 1% |
| 2015 | 0.87 | 1% |
| 2016 | 0.83 | 1% |

Here, as with the Model 1, we ran a model for each of the three time periods: 1992-2016, 1999-2007 and 2002-2004. Given the results of the visual inspection, we expect the DID

parameter being lower than in Model 1 when calculated on the longest time span (1992-2016), and possibly not significant, since the difference in employment prospects of the two cohorts (and especially of the older one which is our treatment group) has been discounted of the effect of the pension reform. As for the DID parameters of the period from 1999 to 2007, and from 2002 to 2004, we expect them both to be significant and not remarkably lower than that of the longest time span, since the effect of the pension reform should be more visible in the long run, instead than in the short one, hence inflating the DID estimates of the time span from 1992 to 2016 in Model 1 and producing a severe drop in the coefficient size in Model 2, as we actually saw.

The overall effect of the legislation for Model 2 can be seen in Table 10. For all time spans the effect for the Model 2 is smaller than for the Model 1. However, it stands. The time period from 1999 to 2007 actually shows a lower coefficient than the longer one, however the distance between the two periods in much lower in Model 2 than in Model 1, as expected. The DID coefficient for the time period 1999-2007 is rather close – albeit lower – to that of Model 1; the same happens considering the DID parameter of the shortest time period (2002-2004), which is even slightly higher than that of Model 1.

**Table 10 — Summary of DID parameters by time span considered (Models 1 and 2)**

| Year | Model 1 | | Model 2 | |
|---|---|---|---|---|
| | Diff-in-diff-parameter | Std. error | Diff-in-diff-parameter | Std. error |
| 1992-2016 | .179 | .002 | .078 | .002 |
| 1999-2007 | .079 | .004 | .055 | .004 |
| 2002-2004 | .030 | .009 | .031 | .008 |

Overall, it is not surprising that the effects are smaller for this model than for the previous one, which included the normally retired. As long as the pension reform forced workers who were close to pensionable age to remain active in the labor market, this effect would add to that of the anti-discriminatory legislation. If the pension reform would be the only factor behind the increase of the probability to be employed of the treatment group, then we should observe that the DID parameter becomes insignificant, once the normally retired have been removed from the analysis. At the opposite, should the pension reform have no impact on the employment prospects of older workers, as unlikely as this event would be, Model 2 should show more or less the same parameter estimates than Model 1.

Our actual results stand in the middle, as could be expected, since the DID parameters are lower than those showed by Model 1 for each time span considered, however they are still significant.

It is interesting to note that the shorter the time span considered, the less difference is found between the effects of Model 1 and 2. In other words, in the short run, including or not the normally retired does not make much of a difference. This is probably due to the fact that the more time passes, the stronger becomes the effect of the pension system reform, while in the first years it is much less noticeable, probably with only the effect of anti-discriminatory legislation being in place (Table 41). The same logic could be used for commenting on the fact that the difference between the DID parameters of Model 2 according to the time span considered are much closer to one another than the analogous parameters of Model 1. On the one hand, this means that the effect of the pension reform can be better seen in the long run, given the noticeable distance between the DID coefficient of Model 1 for the time span 1992-2016 (0.0179) as compared to that of the other two periods (0.079 and 0.030). On the other hand, it means that – having removed the most of the effect of the pension reform – what is left (i.e., the effect of the anti-discriminatory legislation) is found to differ before-after 2003, and not as much as the time span considered varies in length.

# Conclusion and discussion

In this chapter, we analyzed the influence of the anti-discriminatory legislation, introduced in Italy in 2004, on the employment prospects of older workers by comparing two age groups: 35-39 years old (which is not the target group for this legislation, hence serving as our control group) and 55-59 years old (who are among the target group of the legislation).

We designed a quasi-experimental setting in which we compared the probability to be employed, instead of either unemployed or inactive, between the treatment and the control groups as a consequence of the anti-discriminatory legislation adopted in 2003, at the same time controlling for the confounding effect of the pension reform that was passed in 2004.

As we reasoned in the first part of the chapter, this research design was intended to possibly infer the presence of discrimination against older workers in the labour market *a contrario*, that is, not aiming at disclosing discrimination *per se* – a difficult task in an era of contested prejudice, as Lucas (2008) contends – but focusing on its possible effects on its targets.

Were we to find no effect of the legislation against age discrimination on our treatment group (workers between 55 and 59 years of age), we should have forcedly admitted to the absence of discrimination against them in the labour market. Of course, this would not have necessarily meant that discrimination had not been there, but just that it would not have been

visible in the time period and concerning the age range we have considered. On the contrary, a positive effect of the legislation on the employment prospects of older workers – once removed the confounding influence of the pension reform – would have been an indirect proof of discrimination against older workers being in operation.

The latter is exactly our conclusion. Our results indeed show that the introduction of the legislation against age discrimination in the labour market had a positive effect on the probability of employment for workers of the age group 55-59. This result stands even controlling for the effect of the pension system reform, and irrespectively of how long the period under observation spans. In fact, we looked at three time periods: from the shortest one, with only one year before and after the policy introduction, to a middle-length one — four years before and after 2003 – to the longest, i.e. 11 years before and after the introduction of the policy under evaluation. Probably, the middle one can be considered giving more reliable estimates: the shorter period might not be enough for the policy to deploy its effect, while in the longest period a lot of other factors (such as the economic crisis) could distort the results. Notwithstanding this, we found that the difference in the employment prospects of the treatment and control groups significantly differed even in the most unfavourable time specification, i.e., from 2002 to 2004.

The results we got are rather strong and significant and could be checked by means of other techniques and/or research designs in the future. For now, given the difficulties in finding age discrimination in operation in the labour market beyond any reasonable doubt, and even given the theoretical debates surrounding the notion of discrimination itself (Lucas 2008), we believe that our analysis constitutes a first, albeit indirect, evidence of age discrimination against older workers in Italy upon which future research can build.

# Chapter 3. Age discrimination: experimental research[14]

## Introduction

In the previous two chapters, we have discussed how studying discrimination has been a hard challenge for anyone, especially considering the blurring boundaries between discrimination and inequality happening due to non-discriminatory reasons. We concluded that using different approaches and methods is key to capture the complexity of this concept.

In the first chapter we also discussed the importance of such factors as job type or experience on the hiring decisions made when the choice is between an older or a younger applicant. Another important factor (also, discussed in chapter 1) is the role of norms and social influence that weighs on the people when they are making potentially discriminatory decisions.

In this chapter we would like to elaborate on the role of those factors and distinguish between them and the purely age factor.

We will present the results of a laboratory study that we conducted among Italian students of the University of Brescia, Italy with the help of Ztree software (Fischbacher, 2007). Here, we will focus on age discrimination in hiring. This type of discrimination occurs when a potential employee is not accepted for a job position not because of his or her professional abilities but because of his/her age, i.e., being too old or too young. In our case, we concentrated on older job applicants for the reasons we have already discussed previously.

In the first chapter we have discussed in detail and with various examples the use of experimental approach to studying discrimination, specifically in hiring (see sections 5 and 7 of that chapter). There we have also talked about the pro's and con's of those methods and the facts that laboratory experiments compared to other methods have been rarely used in the last years.

While there are many examples of field experiments on age discrimination (e.g., Riach, Rich, 2006, 2007, 2010; Albert, Escot, Fernández-Cornejo, 2011; Baert et al, 2015; Riach, 2015), with the laboratory research most of the previous studies are attributed to the 1970s and 1980s. Recently,

[14] The experiment was conducted with the help of GECS laboratory at the University of Brescia. The author would like to thank its members: Prof. Flaminio Squazzoni, Prof. Marco Castellani, Niccolò Casnici, Linda Alengoz, Federico Bianchi, Jonnabelle Asis and Aliakbar Akbaritabar — for their useful comments on the experimental design and help with the organization and realization of the experiment. The author also expresses her to thanks Prof. Giangiacomo Bravo (Linnaeus University) for his useful comments on the experimental design and methods of data analysis.

Richardson and colleagues (2013) and Kauffmann and colleagues (2015) have used survey experiments to analyze people's choices between hypothetical candidates depending on their age and other factors. Their findings indicated that older or older looking candidates were chosen less frequently than younger or younger looking ones. In this chapter we will follow in their footsteps and those of researchers of the past to see in the laboratory setting as to whether the issue is with age or other factors are more important?

In the first chapter, we have discussed the importance of distinguishing among different motivations behind discriminatory or seemingly discriminatory actions. As we have pinpointed in the section 6 of the first chapter, there are two main purely discriminative reasons behind hiring decisions: imperfect information in the labour market (i.e., statistical discrimination) and cultural norms that favour youth at the expense of older people (tastes-based discrimination). Apart from them there are many other reasons (Table 1 on page 41) that can be attributed to both discriminatory reasoning and reasoning based on objective facts (i.e., the result is inequality that happens due to non-discriminatory reasons). Research on age discrimination unfortunately disregards these important, yet subtle distinctions in reasoning of the decision-makers, thus, potentially considering certain decisions as discriminatory whereas they are driven by non-discriminatory intentions, and vice versa. In order to disentangle this nexus of intentions and motivations, it is essential to control the decision environment, and this is what experimental research is suitable for (e.g., Boero et al., 2009).

We have already discussed certain limitations of secondary data studies in capturing the differences in outcomes from different groups of individuals, which makes any attempt at distinguishing discrimination from inequality happening due to non-discriminatory reasons particularly difficult (Lucas, 2008, 2013). Indeed, these studies can at best explore the difference that may point towards discrimination or may not. At worst, we may find seemingly no difference in the situations of the risk groups and the groups that are not at risk of discrimination. The last finding will not necessarily mean that the discrimination is not there. It may just hide in other actions and situations, even with people having, for example, equal pay but being harassed at work due to their age.

On the other hand, field experiments on age discrimination have similar limitations as we have discussed in the first chapter. They do not allow to control for the factors that influence the potential employers' decisions as consist only of resumes of the candidates sent in response to the vacancies and response rates received. The researcher, for example, cannot know who were other candidates with whom were compared the fictitious candidates. The researchers, in this situation, also cannot follow the

decisions-making process, thus, leaving any motivations behind the decisions out of the scope of the study.

Although with all caveats, laboratory experiments are most suitable to control for the confounding factors and remove unnecessary ones by exploiting the artificiality of the setting. While real settings are context-specific and incorporate a variety of factors which might have an influence, our aim has been to concentrate on specific factors without pretension of empirical richness. Furthermore, while we understand the cautious attitude towards using students as experimental subjects and the fact that students and employed people can potentially act differently (e.g., Singer, Sewell, 1989; Singer, Bruhns, 1991), more recent research did not find any significant difference between different subject pools, i.e., students vs. workers, in age discrimination research (e.g., Richardson et al., 2013). Secondly, considering that we aimed to analyze discriminatory attitudes and the environment in which they could persist, a student population is suitable in representing the establishment of recent cultural frameworks and attitudes which will probably characterize the economy and the labour market in the next years. In this sense, students represent the upcoming future of the labour market in terms of attitudes and stereotypes.

# 1. Research questions and hypotheses

As we have discussed in the introduction, we believe that distinguishing, at least attempting to do it, it necessary for understanding of the finer points of discrimination process. This is why in this part of the thesis, we focused on, firstly, looking at the importance of various factors that could influence the employment of older people apart from age specifically. As was already said in the introduction to this chapter and in the first chapter, the type of vacancy and experience are no less important than age itself, according to the previous research. Aside from that, more subjective attitudes that often arise from the cultural and social environment play important role too, even if disentangling them is much more difficult than analysing more tangible factors. Thus, in our research we also aim to see whether reinforcing the pressure to comply with socially acceptable norms will result in the participants of the research to be more discriminative.

Hence, in our research, we have focused on two main questions regarding the role of age and other factors that can influence recruitment decisions and the environment around recruiters. Here we will only state them and present some more explanations and elaborations below.

The research questions are as follows:

1. Are there objective characteristics of a job vacancy (i.e., executive vs. supervised), objective characteristics of applicants (education; additional training; experience), objective characteristics (age, gender) or subjective attitudes of recruiters that influence age discrimination among job applicants?
2. Does an environment with strong social influence and pressure to comply with existing norms increase the level of age discrimination?

While the first question is built on previous experimental research studying age discrimination, the second one aimed to enlarge the perspective to look at the social context in which decisions take place in more detail.

Previous research suggested that older workers are often considered less motivated, competent and efficient, as well as less healthy than their younger counterparts (Riach, Rich, 2007; Kaufmann et al., 2015). This can probably explain the division of between young-type and old-type jobs with older workers being less discriminated when applying for old-type jobs (Perry & Bourhis, 1998). Research also found that competence matters, with younger applicants who are rated higher than older ones even when candidates have the same level of competence (Haefner, 1977).

However, it is probable that the situation has changed today. On the one hand, people study longer and enter the job market later (e.g., Fernandes-Alcantara, 2018). On the other hand, the increasing life expectancy in most countries worldwide, the importance of off-the-job training and on-the-job experience and later retirement policies and plans could have led to two different outcomes. The first one, as we pointed in the second chapter, is that the the increase of older people in the job market could have resulted in the enhanced age discrimination (Lozon, Barratt, 2013; Rippon et al., 2013. However, the second one is the contrary: the various attempts at creating an ageing friendly society (e.g., WHO, 2002) could have made age differences less relevant.

Nevertheless, health stereotypes can be important when the employer has to fill a vacancy that requires physical work and/or more intensive work effort, even if, as we said in the second chapter, some research shows that older workers have ways to compensate for age-related problems when working (e.g., Chaparro et al, 1999; Brooks et al, 2001; Lobjois, Cavallo, 2006; Schwerha, Wiker, Jaraiedi, 2007). However, this may be typically reconsidered when the job requires potential candidates to have some managerial, supervision experience and so be familiar with roles of autonomy and responsibility. Reaching supervisory positions usually requires years of professional work experience. To become an effective and reliable executive, an employee also needs to spend extensive time performing this role. Thus, more experienced albeit older workers may be more competitive than

younger workers for some positions. As we have seen in the introduction, experience often proves to be more important than other factors, thus, making older workers more competitive.

Following this, we presented the first three hypotheses.

*Hypothesis 1.* For job vacancies with prevailing operative functions, if age is the only factor differentiating between two candidates, employers will choose younger candidates, thus systematically discriminating older applicants.

*Hypothesis 2.* For the job vacancies with executive functions, if age is the only factor differentiating between two candidates, there will be no discrimination against either older workers or younger workers, i.e., decisions in favour of older or younger candidates will be equally distributed.

*Hypothesis 3.* Higher experience and/or higher competence will outweigh the negative influence of age and decrease discrimination against older workers.

Our final Hypothesis 4 is based, firstly, on previous studies on the importance of social influence (e.g. the role of social networks, rumors, social judgment, etc.) in individual decision-making (e.g. Cialdini & Goldstein, 2004; Muchnik et al., 2013) and hiring specifically (e.g. Takács et al., 2014; Dalal et al., 2015). Secondly, as we have discussed in the first chapter, one of the theories behind age discrimination is that cultural norms often position "young" as better than "old". And, as we have already established in the first chapter, stereotypes play a very important role in the discriminatory decisions. Moreover, if we can also look at the other theory behind discrimination, i.e. the issues of imperfect information. In case of uncertainty in an attempt to avoid risky decisions, employers may start using age as a proxy for the candidates' abilities if they cannot test those abilities on the spot (e.g., Aigner, Cain, 1977) and do not have all available information about those abilities. Or they may simply decide to follow their prejudiced beliefs often induced on them by the societal norms and values (Lucas, 2008). Either way, if imperfect information and/or social norms will give the employers the image of older people being worse at the job than younger people, they will act in a discriminative way. In a reverse situation, which we do not expect to be the case of age discrimination, they will act in a non-discriminative way.

In this paper we induce on our participants from treatment group, who are playing the role of recruiters, an environment that is rather strict and homogeneous that requires the participants to comply with the way other people act, i.e. their reward depends on how close their responses will be to the responses of the previous participants. Their actions — whether discriminatory or not — will be a good indicator of how they frame their own environment and figure out the role of norms inside it. The

comparison with the control group (who will not be subjected to this influence) will serve as an indicator as to whether personal beliefs of the participants are consistent with the environment they feel to be in, i.e. whether their beliefs without open pressure are consistent with their actions when they are openly pressured to act as other people around them.

By using this financial stimulus, we are adding an endogenous pressure on participants, in order to understand what they would consider "the standard", "the habit", "the norm", in the hiring environment. Since participants are students who will soon be leaving education, we should be able to highlight the attitudes with which they are likely to enter the labour market. They will be working with people of different ages and experiences, and many of them within some years will either have connection to hiring decisions or, at the very least, to the in-place environment and the attitudes towards different groups of people, older workers among them.

There can, of course, be two lines of reasoning. On the one hand, we may say that conforming to norms for the participants will mean conforming to the socially acceptable behavior, which will mean not discriminating, especially, if the participants are familiar with the anti-discriminatory legislation. However, this will only be the case if they believe that the firms around them are also strong believers of age not being a valid factor in decision-making. As we know from previous works about Italy, there are examples of age discrimination in labour market of Italy (Segalla, Jacobs-Belschak, Muller, 2001; Rymkevitch, Villosio, 2007; Lazazzara, Bombelli, 2011) with age stereotypes not being considered something negative or discriminatory (Guaglianone, Ravelli, 2015). Thus, it is more likely that the participants will be also inclined to follow in this line of reasoning and, trying to conform to the environment, will become more discriminative. Hence, *Hypothesis 4.*

*Hypothesis 4.* An initially unequal distribution of preferred applicants by previous recruiters will tend to amplify when the recruiters act in the environment of strong social pressure. Recruiters' compensation will depend on their conformity with the majority decisions made by previous ones. Participants are expected to consider the social norm the belief shared by many employers about older workers to be less apt than younger workers.

# 2. Methodology and experimental procedure

As we said before, we are building our methodology of research on the previous laboratory and field studies in which researchers either simulated job market situations (laboratory experiments) or send fictitious resumes to the companies (field experiments).

In the simulated job market situations, participants are usually presented with CVs or videos of interviews with the candidates who vary in age, gender, race, experience, etc. and are either asked to evaluate these candidates (Locke-Connor, Walsh, 1980; Fusilier, Hitt, 1983; Avolio, Barrett, 1987; Cleveland et al., 1988; Gibson et al., 1993; Perry et al., 1996; Perry, Bourhis, 1998; Richardson et al., 2013) or to make hiring decisions (Haefner, 1977; Connor et al., 1978; Singer, Sewell, 1989; Kauffman et al., 2015). In laboratory experiments evaluation is more popular than direct choices. In our study we will ask participants to make a choice between the pairs of candidates in order to make the simulation as close as possible to the real-life situation.

To examine the questions and hypotheses discussed in the previous sections, distinguishing among objective characteristics of the job vacancies, as well as among certain subjective characteristics of the job applicant is crucial. Furthermore, it is important to control for formal training and work experience as recruiters could consider this while deciding among alternatives (Haefner, 1977; Locke-Connor, Walsh, 1980). This will also help us to distinguish discriminative preferences from rational risk reduction under uncertainty.

Thus, for this study we simulated a hiring situation where the participants were asked to consider themselves employees of an agency which has to hire people for two vacancies: electrician and managing director for mergers and acquisitions. The first job is a physical one (which may provoke some age-stereotyping due to older workers being often considered less healthy) but also requiring knowledge and experience while the second one has executive functions, thus, requiring high level of experience and competence.

The participants were presented with the vacancy description and pairs of short CVs of the candidates in which there was information about their age, gender, education, years of experience and whether they had any additional training in the recent years, 24 pairs of choices in total (see Appendix 7). The vacancies were created based on the real vacancies on the job search websites.

To control for possible confounding factors, we imposed certain simplifications to the recruitment process. Firstly, we assumed that all competing applicants had the same cost for the company who would eventually hire them (in terms of wages, social security payments, etc.). Secondly, all applicants were presented to recruiters with a short bio, without personal details, pictures or more vivid CVs. Finally, recruiters were asked to choose between pairs of candidates instead of a list so as to remove the impact of ordered sequence. While this is not what usually happens during real-life hiring processes, these simplifications are introduced in order to avoid the potential influence of unobservable factors.

By manipulating the variables inside the CVs and the participants' decisions, we were able to check the first three hypotheses.

To evaluate the fourth hypothesis, we divided our participants into control and treatment group. The control group was not informed about the specific form of remuneration, only that they will be paid in the end of the experiment, and, in the end, each participant received the same sum of 15 euros. The treatment group was informed that there was a group of participants who already took part in this experiment. The participants of the treatment group were told that for each decision matching the majority of responses (i.e. more than 50%) made by the control group they will receive 80 cents; for each decision not matching the majority of responses they would lose 80 cents. In case they lost more than gained, they would receive 5 euros for participating. Thus, they could earn between 5 and almost 25 euros.

In the end of the experiment, participants were presented with a questionnaire (see Appendix 7) whose purpose was to evaluate participants' attitude towards older workers (aged 50+) in terms of their personal traits, not related to their professional abilities, and in terms of their professional abilities. The questionnaires were based on the previously performed surveys (Power (1987); Burdyak et al (2015)) conducted to study attitudes towards elderly people and/or workers.

The detailed materials that were presented to the participants can be found in the Appendices 6 and 7 in the end of this thesis.

# 3. Data

The study was conducted among 121 students of the University of Brescia randomly selected and aged from 18 to 34 (mean = 22.4; standard deviation = 2.5). 61 participants were part of the control group (from 19 to 27; mean = 21.9; standard deviation = 1.8), while 60 were part of the treatment group (18 to 34; mean = 22.9; standard deviation = 3.0). There were 70 females and 51 males with 36 and 35 in the control group and 34 and 26 in the treatment group respectively (see Table 11).

**Table 11 — Data description (age and gender)**

| Group | Age | Gender |
|---|---|---|
| Control | Min = 19;<br>Max = 27;<br>Mean = 21.9;<br>Std. Dev. = 1.8 | 36 females;<br>25 males |
| Treatment | Min = 18;<br>Max = 34;<br>Mean = 22.9; | 34 females;<br>26 males |

| Group | Age | Gender |
|---|---|---|
| | Std. Dev. = 23.0 | |
| Both | Min = 18;<br>Max = 34;<br>Mean = 22.4<br>Std. Dev = 2.5 | 70 females<br>51 males |

Among all the participants, 43.8% had professional experience working with people age 50 and more (44.5% and 55.7% in the control group and 43.3% and 56.7% in the treatment group respectively). Almost 100% of those who did have experience reported it as "positive" (94.1% in all groups; 92.3% in the control, 96% in the treatment group). All participants had relatives of that age. 1/3 of the participants were aware of anti-age discrimination legislation in the labour market (31.4% in total; 29.5% in the control group and 33.3% in treatment group) (see Table 12).

**Table 12 — Data description (Professional experience with older people; relatives age 50+ and knowledge about anti-discriminatory legislation)**

| Group | Professional experience with older people | Quality of that experience | Relatives aged 50+ | Knowledge about anti-discriminatory legislation |
|---|---|---|---|---|
| Control | Yes — 44.5%<br>No — 55.7% | Positive — 92.3%;<br>Negative — 7.7% | 100% | Yes — 29.5%<br>No — 70.5% |
| Treatment | Yes — 43.3%<br>No — 56.7% | Positive — 96.0%;<br>Negative — 4.0% | 100% | Yes — 33.3%<br>No — 66.7% |
| Both | Yes — 43.8%<br>No — 56.2% | Positive — 94.1%;<br>Negative — 5.9% | 100% | Yes — 31.4%<br>No — 68.6% |

Thus, we can see that the treatment groups did not differ a lot in terms of gender and age. They also possessed very similar level of experience in what concerned communications with older people and older workers and had similar level of knowledge of anti-discriminatory legislation. Thus, all those factors could not have influenced responses in the control and treatment groups and be the reason to the difference between them (if any).

# 4. Results

Firstly, we conducted a McNemar's test for binary data to test the main hypotheses.

However, additionally to that we also conducted descriptive analysis to see whether there was any reason to believe that there is a difference due to gender of the candidates. After that we analysed

of the contingency pairs (a standard approach used in the type of research, e.g. Riach, Rich, 2006) and building of a mixed-effects logistic regression with random-effects on the participant (see, e.g., Williams, 1975; Stiratelli, Laird, and Ware, 1984; Kuk, 1995) for a more in-depth approach to analyze the effects of all the variables

## 4.1 Direct hypotheses testing

As per classical approach (e.g. Fisher, 1966), we took as a H0 hypothesis that there was no difference between responses, i.e. the responses of the participants did not change regardless of the type of job or differences in levels of experience and training. If p-values, resulting from the tests ran, were at least less than 0.1 or smaller, than we could reject the hypothesis of the equal distribution and accept the alternative hypothesis that there was a difference between the two. If not, then we did not reject H0 and assumed that there was no difference and, thus, the responses given were independent.

From the Table 13 below, for the first two hypotheses we can see that there is a difference between the choices made depending on the type of job as p-value is below 0.1 if the candidates had the same experience. However, the test here does not allow us to see the exact influence on decisions, i.e. who the participants favoured: older or younger candidates. We will discuss this in the next sections and see that the participants tended to choose younger candidates much more often if they possessed the same level of experience as older workers.

For the third hypothesis, we can also see that experience and training influence the decision-making process as p-value is less than 0.1. In the next sections we will discuss that higher experience and additional training made older candidates no less attractive for the recruiters and sometimes even more do than younger ones.

Finally, for the fourth hypothesis we can see a high p-value, bigger than even 0.1. Thus, the extra social influence induced on the participants did not have any significant role in the decisions-made and the responses of the control group did not significantly differ from the responses of the treatment group.

**Table 13 — McNemar's test**

| Hypotheses | McNemar's chi2 | P-value |
|---|---|---|
| **Hypothesis 1.** For job vacancies with prevailing operative functions, if age is the only factor differentiating between two candidates, employers will choose younger candidates, thus systematically discriminating older applicants. | 241,06 | 0,0000 |
| **Hypothesis 2.** For the job vacancies with executive functions, if age is the only factor differentiating between two candidates, there will be no discrimination against either older workers or younger workers, i.e., decisions in favour of older or younger candidates will be equally distributed. | 272.92 | 0,0000 |
| **Hypothesis 3.** Higher experience and/or higher competence will outweigh the negative influence of age and decrease discrimination against older workers. | | |
| **Experience** | 97,45 | 0,0000 |
| **Experience and competence** | 142,52 | 0,0000 |
| **Hypothesis 4.** An initially unequal distribution of preferred applicants by previous recruiters will tend to amplify when the recruiters act in the environment of strong social pressure. Recruiters' compensation will depend on their conformity with the majority decisions made by previous ones. Participants are expected to consider the social norm the belief shared by many employers about older workers to be less apt than younger workers. | 0,23 | 0,6302 |

However, as we used additional control and factors that could have influences the decision-making, in the next sections we will delve into a more detailed analysis, particularly of the gender issue. It was not in the focus of this study, but we need to make sure that it does not influence the results in a significant way or, if it does, then how.

## 4.2 Descriptive analysis

Here we analyzed the responses that were given by the participants from the control and treatment groups (see Appendix 8 from Figure 43 to Figure 66).

For example, for the position of electrician, when both candidates were males we can see that when candidates differed only in age with the same experience and absence of additional training, the participants tended to remarkably prefer younger candidates to older ones (Figure 43), while when the older candidates were more experienced, the distribution was closer to 50:50 with a slight favour towards older candidates (Figure 44). When older candidate also had proof of additional recent training, the preference for older people became even higher. However, more than 20% of the participants still preferred younger candidates (Figure 45). This holds both for control group and for treatment group.

When the candidates were both females, the overall preference was close to the one that we saw with the male candidates. The picture was the same for the situation with the difference in age only (Figure 46) and in age and experience (Figure 47). i.e. a strong preference towards younger candidates in the first case and a close to 50:50 situation in the second one. However, in the case of difference in age, experience and additional training the situation was slightly different from the one we saw with male candidates. While participants still preferred older candidates, the responses here were a lot closer to 50:50 than in the case of males, more that 34% in the control group and almost 42% in the treatment group preferred younger candidates. We can also see that the treatment group was more favourable towards older candidates than the control group, which was not the case for male candidates (Figure 48).

In case of comparison between younger male candidate and older female candidate, we can see that the preference for younger candidates was far more prominent than in previous cases. When age was the only difference (aside from gender), the younger candidate still preferred the older one to the same extent as when the candidates were of the same gender (Figure 49). However, the younger candidates were also preferred when the older candidate was more experienced, and treatment group was slightly more favourable towards younger ones than the control group (Figure 50). When older candidate also had additional training, the older candidates became chosen more often but still the older candidate was not preferred as often as it was in the case of two male candidates but the distribution was close to the one that we saw when looking at the female candidates: more than 30% from control group and more than 40% from treatment group prefer younger candidates (Figure 51).

In the case of younger female candidate and older male one, the situation was reversed. In the case of difference only in age, younger candidates were still preferred but to lesser extent than in all previous cases. More than 20% from control group and more than 30% from treatment group chose older males over younger females (Figure 52). In the case of difference in age and experience, the distribution was very far from 50:50 with older candidates being favoured more (Figure 53). When the older candidate also had additional training, the preference for older candidate was also much higher than in previous cases (Figure 54).

For the position of managing director situation was a bit different from the position of electrician. For two male candidates, when the only difference was age, the preference for older candidates was slightly higher than in the case of electrician, even though the younger candidate choice was dominant (Figure 55). In the same time, when there was also a difference in experience, the distribution was very close to 50:50 as was with the position of electrician (Figure 56). The existence of additional experience among older candidates made the situation much more different: older candidates were a lot more preferred compared to the same thing with the electrician position even if for both positions older candidate was preferred (Figure 57).

The response distribution for two female candidates was very close to the one for female candidates. It was almost the same when the difference was only in age with slightly higher preference for younger candidates (Figure 58). For the difference in age and experience, the picture was almost the same in the case of control group (almost 50:50) and different for the treatment group (older candidate is preferred) (Figure 59). With the additional experience thrown into the mix, the older candidates were prioritized as in the case of male candidates but to a slightly lesser extent (Figure 60).

For the comparison between a younger male candidate and an older female candidate, older candidates here ended up in a better position than in the case of the electrician vacancy. A younger candidate was still significantly preferred than an older candidate if age was the only difference (Figure 61) but preference for older candidates was shown in the treatment group when there was also difference in experience. Control group still preferred younger candidates but came close to 50:50 distribution (Figure 62). When older candidate also had additional training, the decisions were largely in favour of older candidates (Figure 63), which was not the case for the electrician position.

The picture was almost the same when the genders were reversed. An older male was favoured if he had more experience (Figure 65) and if he had more experience and training (Figure 66) than a younger woman but more than in the case of younger male and older female, i.e. the distribution was further from 50:50. When the only difference was age, the younger candidate was still preferred a lot more (Figure 64).

To summarize, we can say that the simple comparison between decisions showed us the following.

1) Both in control and treatment groups the subjects tended to favour younger candidates against older candidates if the only difference between them was age for both electrician and managing director positions. However, in certain cases, the preferences between control and treatment groups differed slightly if genders of the participants were different. Treatment group showed slightly more favour towards older women for the managing director vacancy and to older males in case of electrician vacancy.

2) When the older candidates had more experience than the younger ones, the distribution tended to become close to 50% vs. 50% for the position of the managing director. For the position of an electrician, the close 50% vs. 50% distribution held for the decisions when both candidates were of the same gender. As for the decisions when the candidates were of different genders, subjects tended to favour male candidates more (i.e., they preferred a younger male against an older female and an older male against a younger female).

3) When older candidates had more experience and additional training than younger ones, older candidates were preferred but not as much as younger candidates were preferred compared to older ones if there was no difference in experience and training.

Thus, we can theorize that there is discrimination against older applicants in the situations when they have no advantage against younger workers. The more advantages they have in terms of their professional experience and proof of their up-to-date knowledge, the more is the tendency of younger workers ending in a less favourable situation with no evidence of discrimination against older workers. In addition to that, women tend to end in less favourable position compared to men regardless of their age, especially if we are talking about the position of electrician which can be considered a "male"-type of job. They were slightly less disadvantaged in the case of the managing director position. This stands both for control and treatment groups, with the treatment group being slightly more favourable towards older candidates when it concerned the difference only in experience.

We will now move onto the analysis of the contingency tables that will help us understand whether the differences seen in descriptive analysis are significant.

## 4.3 Hypotheses correspondence tables' tests with control for gender

Here, we ran standard tests aimed at analyzing differences between responses in case gender differenced influenced the results. We used Chi-square, Cramer V, Fisher exact and Kendall's Tau-b test, as we had here binary and/or categorical variables (see tables in the Appendix 9). Ideally, those

tests should produce the same results. However, for example, chi-square is not the best measure if there are less than 5 values in any of the cells of the contingency table (Larntz, 1978). In this case, Fisher exact test is better. Thus, we used several tests to establish consistent results.

Firstly, we checked the first two hypotheses, from which we expected to see whether difference in job types had a significant influence on the decisions made.

*Hypothesis 1.* For job vacancies with prevailing operative functions, if age is the only factor differentiating between the two candidates, employers will choose younger candidates, thus systematically discriminating older applicants.

*Hypothesis 2.* For the job vacancies with executive functions, if age is the only factor differentiating between the two candidates, there will be no discrimination against either older workers or younger workers, i.e. the decisions in favour of older or younger candidate will be equally distributed.

First, to check our hypotheses, we ran tests on whether there is a relation between decisions made for the same pairs of candidates that differed only in the type of job. The tests showed that while for some decisions there was a dependency, for others — there was none. We ran these tests both for control and treatment groups. It is hard to draw any final conclusions as depending on the age and gender of the participants the results were different. We found strong significant results for the cases of both males when older candidate had more experience than a younger one and had additional training in the recent years at the top of it (5% significance); for younger male and older female with the same experience and training (1% for Chi-square and Kendall's Tau-b and 5% for Fisher exact test); for younger male and older female with older candidate having more experience (5% for Chi-square and Kendall's Tau-b and 10% for Fisher exact test); for younger female and older male with older candidate having more experience (10%) in the control group (see Table 47 in Appendix 9) and for both males with the same experience and training (5%), for both males when older candidate had more experience (5% for Chi-square and Kendall's Tau-b and 10% for Fisher exact test), for both females with the same experience and training (5% for Chi-square and Kendall's Tau-b; insignificant in Fisher exact test); for younger male and older female with the same experience and training (5%) in the treatment group (see Table 48 in Appendix 9).

So, what we can conclude at this level is that the type of vacancy did have influence on the choice between an older and a younger candidate (as we also do in the descriptive analysis) but we need to do some more in-depth analysis (like regression analysis) to better understand the mechanisms.

At this stage, it is not possible to confirm of reject the hypothesis, as there are too many other variables that can play role.

We ran the same tests to see whether we can accept or reject the hypothesis about the role of objective factors such as experience and additional training when there is also gender in the picture.

*Hypothesis 3.* Higher experience and/or higher competence will outweigh the negative influence of age and decrease discrimination against older workers.

Here we got a very strong connection between the decisions made and the form in which the candidates differed which was significant at 1% for all genders and job vacancies, as well as for control and treatment groups (see Table 49 and Table 50 in Appendix 9). This is in line with what we saw in our descriptive analysis.

Finally, we ran the tests for the hypothesis about social influence.

*Hypothesis 4.* An initially unequal distribution of preferred applicants by previous recruiters will tend to amplify when the recruiters act in the environment of induced organizational isomorphism. Recruiters' compensation will depend on their conformity with the majority decisions made by previous ones. Participants are expected to consider the social norm the belief shared by many employers about older workers to be less apt than younger workers.

Here the results were also inconclusive, showing the influence of treatment on some of the decisions but not on all of them. We found significant results for the position of electrician when a younger candidate was male and an older one was female. There was no difference in additional training and experience (5% for Chi-square and Kendall's Tau-b and 10% for Fisher exact test), when older candidate was male and younger candidate is female and they only differ in age (10%), when older candidate was male and younger candidate was female and they also differed in experience (5%); when older candidate was male and younger candidate was female and they differ in experience and training (5%). For the managing director position we had differences when the younger candidate was male, older candidate was female and they differed in experience (1%) and younger candidate was female, older candidate was male and they differed in experience (10%) (see Table 51 in Appendix 9).

As we can see, it is hard to say whether treatment had any influence as significant difference between groups showed only for some situations but not for most of them. Also, if we use strict approach (i.e., the 1% significance level as a cut point) we will see practically no difference between the two groups.

Currently, we can only say with certainty that other factors aside from age (experience and training) have an undeniable influence on recruiters' decisions while gender role and factors aside from experience and training more in-depth analysis in needed. As classical tests do not give us conclusive results due to the existence of too many variables in our case, we will move onto modeling which we will discuss in next section.

## 4.4 Mixed-effects logistic regression with random-effects

All previous tests do not give us enough proofs or disproof of our hypotheses. For this reason, we are running a more complex model that will allow us to look at all the factors that could possibly be influencing the subjects' decisions. This is mixed-effects logistic regression with random effects on the participants.

It should be noted that some questions used in the questionnaire had to be excluded from the model: the subjects opinion of their working experience with older people (almost all subjects characterized it as positive, making it impossible to see any kind of variance); the opinion of subjects regarding the ability of younger and older people to master new technologies (almost all subjects considered younger people more capable to do this) and the questions about subjects having relatives aged older than 50 (all subjects had relatives of this age). All other variables used in the regression are presented and discussed in the Table 14 below).

**Table 14 — Variables' description**

| Dependent variable | Measurement | Baseline | Comments |
|---|---|---|---|
| Age of the chosen candidate | Dummy (1 — younger candidate; 0 — older candidate) | Younger candidate | |
| **Independent variables** | | | |
| Type of position | Dummy (1 — electrician; 0 — managing director) | Managing director | |
| Treatment | Dummy (1 — treatment group; 0 — control group) | Control group | |
| Interaction: type of position and treatment | | No treatment and managing direction position | |
| ***Candidates' characteristics variables*** | | | |
| Candidates experience | Dummy (1 — older candidate has more experience than younger one; 0 — | Same experience for both candidates | |

| Dependent variable | Measurement | Baseline | Comments |
|---|---|---|---|
| | same experience for both candidates) | | |
| Interaction: experience and treatment | | No treatment and same experience for both candidates | |
| Candidates recent training | Dummy (1 — older candidate had recent training; 0 — both candidates did not have training) | Both candidates did not have training recently | |
| Interaction: training and treatment | | No treatment and no recent training | |
| Candidate's gender | Categorical (1 — both males; 2 — both females; 3 — younger male and older female; 4 — younger female and older male) | Both males | |
| Interaction: candidates' gender and treatment | | No treatment and both males | |
| ***Participants' characteristics variables*** | | | |
| Participants' gender | Dummy (1 — male; 0 — female) | Female | |
| Participants' age | Continuous | — | |
| Personal professional experience with older workers | Dummy (1 — has this experience; 0 — does not have this experience) | Does not have this experience | |
| Knowledge about legislation against age discrimination in the labour market | Dummy (1 — knows; 0 — does not know) | Does not know | |
| Father's age | Continuous | — | |
| Mother's age | Continuous | — | |
| Father's employment status | Categorical (1 — unemployed/inactive; 2 — employed/self-employed) | Unemployed/inactive | |
| Mother's employment status | Categorical (1 — unemployed/inactive; 2 — employed/self-employed) | Unemployed/inactive | |
| ***Participants' attitudes towards older workers variables*** | | | |
| Who: | | | |

| Dependent variable | Measurement | Baseline | Comments |
|---|---|---|---|
| — is more productive | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| — is more competent | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| — is more responsible | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| — is better in mastering new technologies | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| — takes more leaves due to illness | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| — is more prepared to work overtime | Categorical variable (1 — younger worker; 2 — older worker; 3 — age does not matter) | Age does not matter | |
| — is better in group work | Categorical variable (1 — younger worker; 2 —older worker; 3 — age does not matter) | Age does not matter | |
| ***Participants' attitudes towards older people in general variables*** | | | |
| Attitude (how they feel around older people) | Categorical variable (1 — positive; 2 — negative; 3 — neutral) | Neutral | The variable was created on the basis of a multiple-choice question (Which of the following words would best describe your general attitude towards and relationship with people aged 50 or more (choose no more than 3 answers)?)) with several possible responses. Responses "distant, wary, uneasy" were |

| Dependent variable | Measurement | Baseline | Comments |
|---|---|---|---|
| | | | considered and negative; responses "sympathetic, friendly, co-operative, respectful, interested" — as positive; indifferent, responsible, none of the above" as neutral. If the number of "positive" responses was higher than the number of negative or neutral responses, the person was attributed a positive attitude; if the negative responses outweighed — the negative attitude was attributed. In case of if equal number of positive and negative choices, a neutral attitude was attributed; if there was equal number of all types of responses, a neutral attitude was attributed. |
| Characteristics (what they think about older people) | Categorical variable (1 — positive; 2 — negative; 3 — neutral) | Neutral | The approach was the same as with the previous question. "Do you consider that most people over 50 are (choose no more than 3 answers)? "Demanding, very conservative, boring, difficult to please" was coded as negative. "Cheerful, helpful, easy to get on with, encouraging, flexible, interesting" — as positive. None of the above as neutral. |

First, we ran the model with only effects of the treatment, the position and the characteristics of the candidates, i.e. only on the variables that are directly connected to the job and to our main hypotheses (Model 1). The results are presented in the Table 15 and Formula 1.

**Formula 1:**

$$log\ (choosing\ younger\ candidates) = 1,99 + 0.43 * position - 0.10 * treatment + 0.34 * position * treatment - 2.24 * experience - 0.46 * experience * treatment - 1.66 * training + 0.43 * training * treatment + 0.35 * females + 0.43 * ymof - 0.45 * yfom + 0.2 * females * treatment + 0.16 * ymof * treatment - 0.66 * yfom * treatment$$

**Table 15 — Mixed-effects logistic model (only effects of the position; candidates' characteristics and treatment)**

| Variables | | Odds ratios | Coefficients | Significance level |
|---|---|---|---|---|
| Type of position (base = Managing Director) | Electrician | 1.54 | 0.43 | 1 % |
| Treatment (base = control group) | Treatment group | 0.90 | - 0.10 | n.s. |
| Interaction: type of position and treatment | Treatment group; Electrician | 1.41 | 0.34 | 10% |
| ***Candidates' characteristics variables*** | | | | |
| Candidates' experience (base = same experience for both candidates) | Older candidate has higher experience | 0.11 | - 2.24 | 1% |
| Interaction: experience and training | Treatment group; Older candidate has higher experience | 0.63 | - 0.46 | 10% |
| Candidates recent training (base = both candidates did not have recent training) | Older candidate had recent training | 0.19 | - 1.66 | 1% |
| Interaction: training and treatment | Treatment group; older candidate has recent training | 1.55 | 0.43 | 10% |
| Candidates' gender | Both females | 1.42 | 0.35 | 10% |
| | Younger male, older female | 1.53 | 0.43 | 5% |

| Variables | | Odds ratios | Coefficients | Significance level |
|---|---|---|---|---|
| | Older male, younger female | 0.64 | - 0.45 | 5% |
| Interaction: candidates' gender and treatment | Both females | 1.02 | 0.2 | n.s |
| | Younger male, older female | 1.17 | 0.16 | n.s. |
| | Older male, younger female | 0.52 | - 0.66 | 5% |
| Constant | | 7.31 | 1.99 | 1% |

Here we see proof of the *Hypotheses 1 and 2*: a job that requires more physical activity is regarded as a better fit for younger workers than for older workers. We found that the position has a positive significant (at 1%) influence on the probability of choosing younger candidate compared to an old one. According to the odds ratios, younger person is 1.54 times more likely to be chosen than an older one for the position is electrician compared to the position of managing director Table 14.

We see confirmation for *Hypothesis 3*: experience and additional training worked in favour of older candidates. Coefficients are significant at 1% level and negative, meaning that younger candidates are less likely to be chosen than older candidates. Judging by the odds ratios, younger candidates are 0.11 times less likely to be chosen compared to older candidates if an older candidate has more experience and 0.19 times less likely to be chosen if older candidate also has additional training (significance – 1%) (see Table 14). When these variables are interacted with treatment variable, the significance stays at 10% but as was the case with the job position, the predictive margins are so close that the difference is almost non-existent both for with experience and additional training (see Figure 5 and Figure 6). So, the treatment did not change the role of training in the choices made.

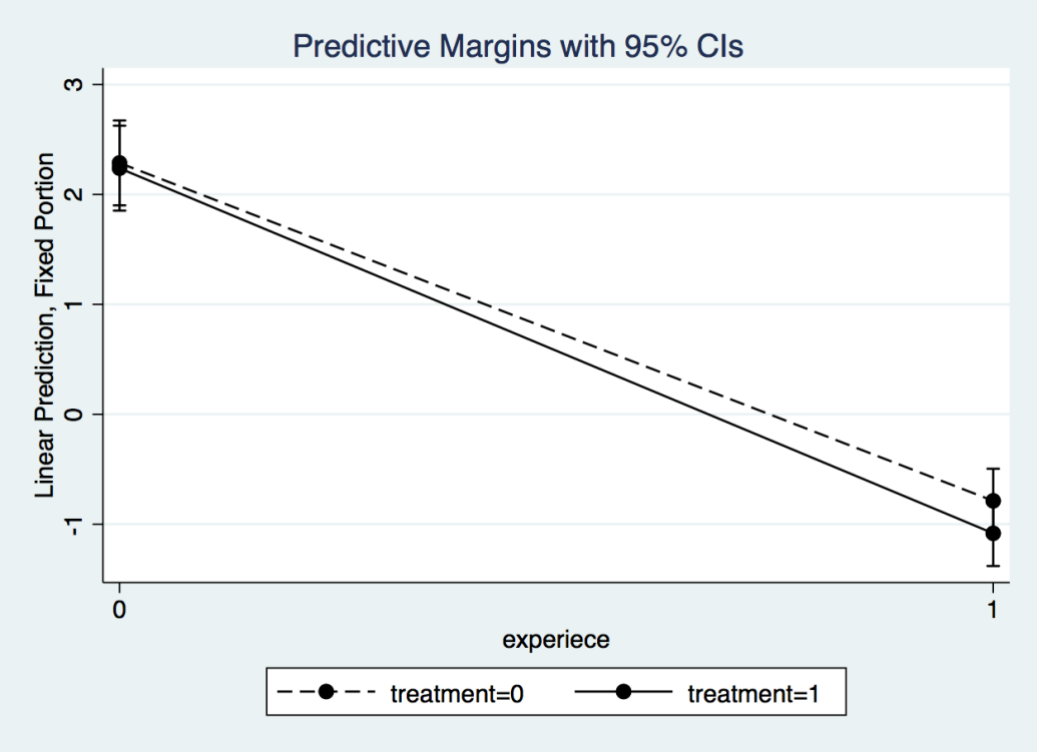


**Figure 5 — Predictive margins for experience and treatment, Model 1**

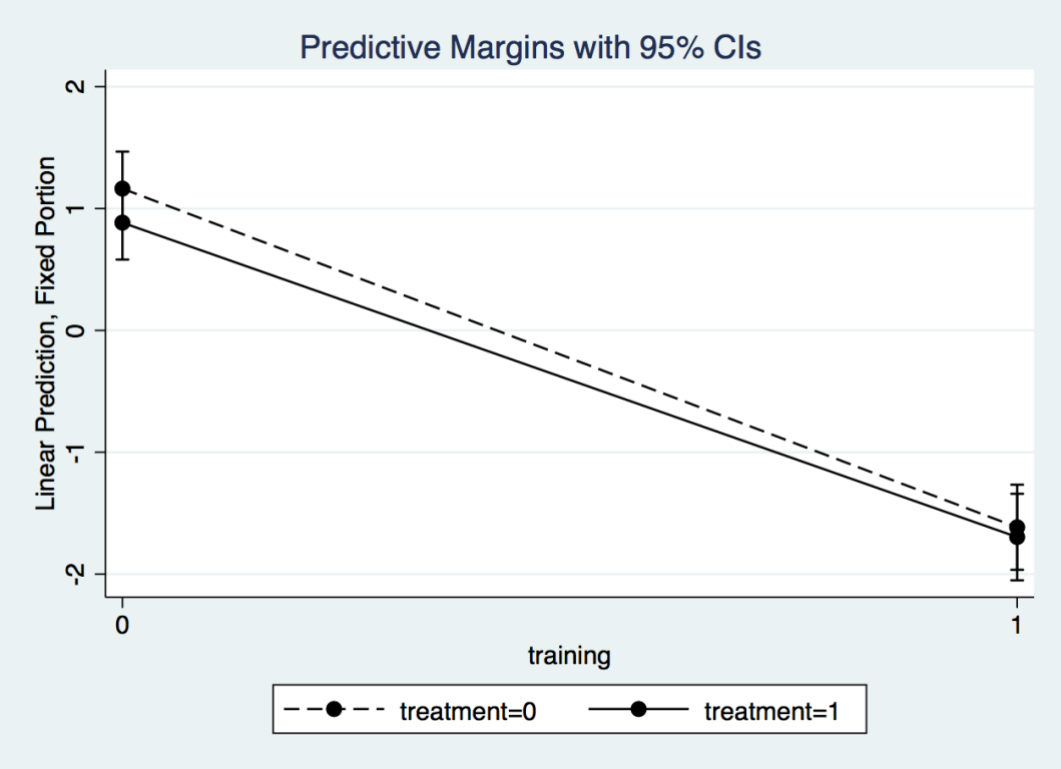


**Figure 6 — Predictive margins for training and treatment, Model 1**

*Hypotheses 4*, according to these results, needs to be rejected: the influence of the treatment variable is insignificant, i.e. the decisions of the participants from the control group did not differ a lot from the decisions of the participants from the treatment group. This means that after we induced social influence on the participants and asked them to perform in the way that they would expect other people to perform the actions did not change much. Thus, social influence or no social influence the behaviour was more or less the same which could come from the fact that certain norms and attitudes are embedded in the peoples mind so strongly that they do not distinguish between their own attitudes and "what others think". Their actions are already consistent with what is considered correct by other people. The interaction between position and treatment is slightly significant (10%) but when we look at the predictive margins (Figure 7) we can see that the confidence intervals overlap so strongly that there is practically no difference at all. So, the treatment did not have any particular influence on the role of the position in the choices made.

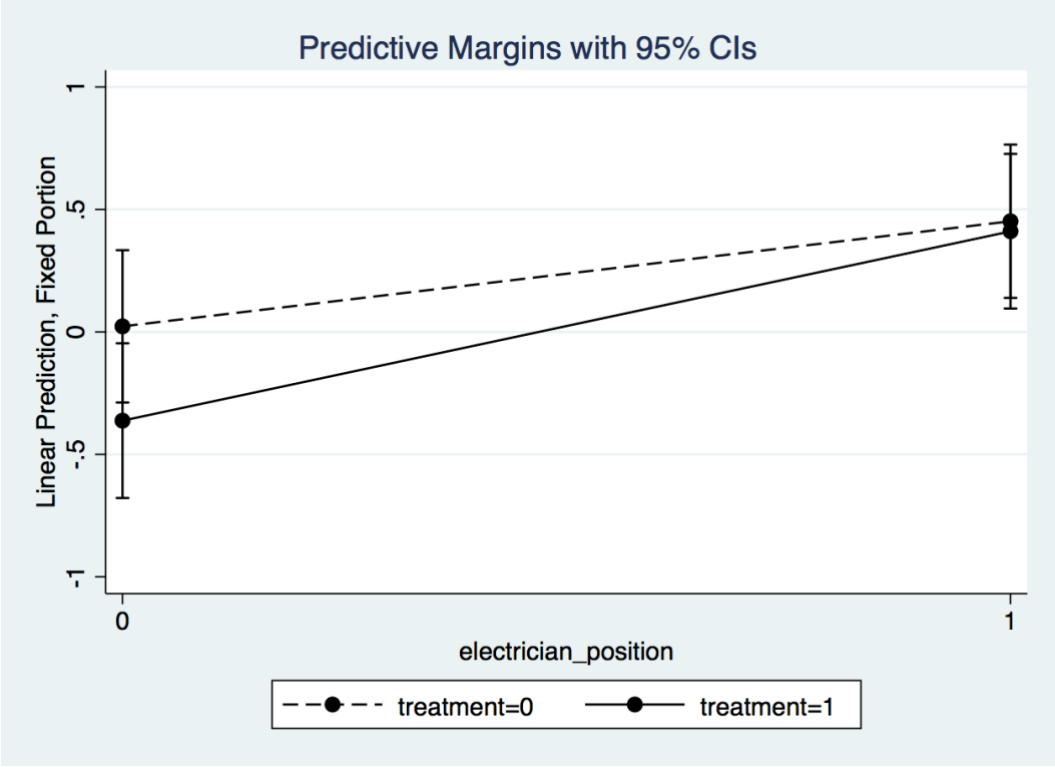


**Figure 7 — Predictive margins for the position and treatment, Model 1**

The candidates' gender effect is weakly significant. According to the odds ratios, younger candidates were 1.42 times more likely to be chosen if both candidates were females compared to both males; 1.53 more likely if younger candidate was male and older was female and 0.64 less likely if younger candidate was female and older candidate was male at 10%, 5% and 5% level of significance respectively. Interacting it with the treatment did not present any significant results, aside from the last

group with 5% significance. We can also this from the predictive margins (Figure 8), i.e. treatment did not change the role of gender in the decisions made.

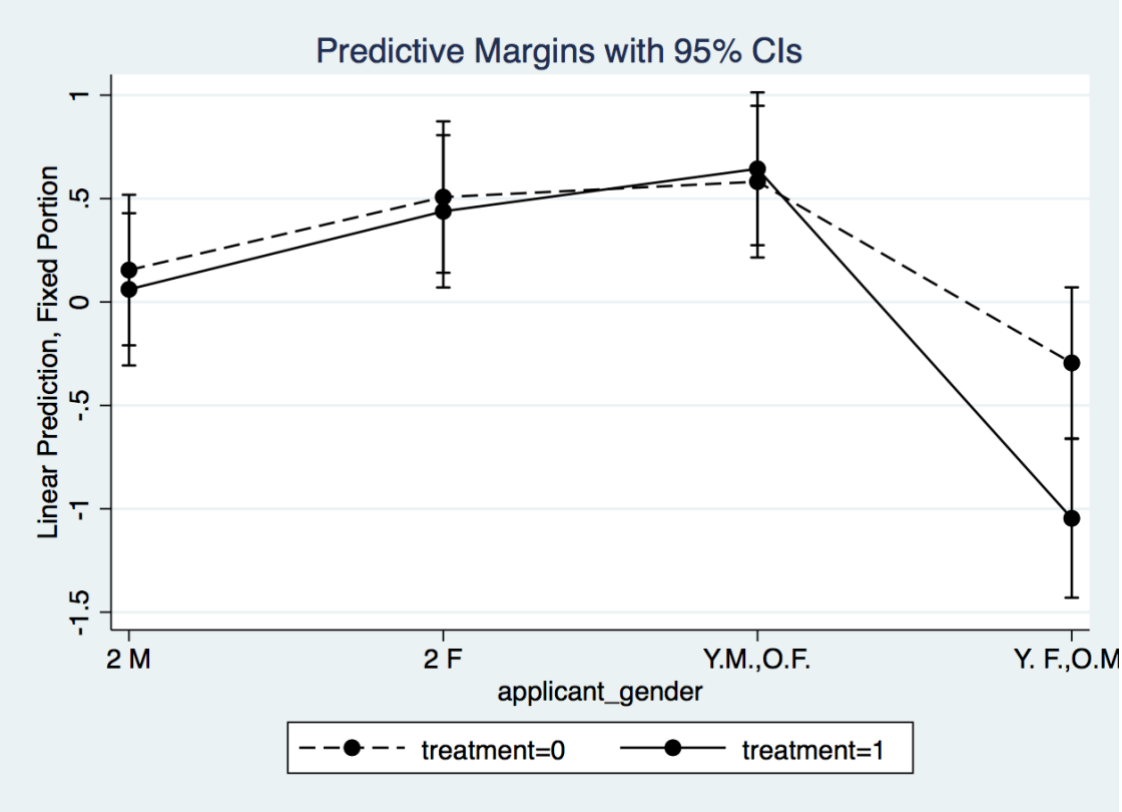


**Figure 8 — Predictive margins for applicant's gender and treatment, Model 1**

With the next step, we introduced the characteristics of the participants both objective (age, gender, family characteristics) and subjective (attitudes towards older people) (Model 2). The results are in the Table 16 and Formula 2.

**Formula 2**

$$log\,(choosing\ younger\ candidate) = -0.08 + .47 * position + 0.30 * treatment + 0.19 * position * treatment - 2.03 * experience - 0.81 * experience * treatment - 1.85 * training + 0.52 * training * treatment + 0.60 * females + 0.75 * ymof - 0.39 * yfom - 0.2 * females * treatment - 0.11 * ymof * treatment - 0.75 * yfom * treatment - 0.2 * p.gender - 0.01 * p.age + 0.06 * p.experience - 0.23 * legislation + 0.08 * p.father.age - 0.06 * p.mother.age + 1.11 * p.father.empl + 0.05 * p.mother.empl - 0.02 * y.productivity + 0.11 * o.productivity + 0.08 * y.ompetency - 0.30 * o.competency + 0.45 * y.responsibility - 0.13 * o.responsibility - 0.41 * y.illness + 0.55 * o.illness - 0.18 * y.overtime + 0.10 * o.overtime + 0.31 * y.group + 0.45 * o.group - 0.30 * attitude.pos + 0.06 * attitude.neg - 0.06 * char.neg - 0.50 * char.pos$$

**Table 16 — Mixed-effects logistic model (with participants' characteristics)**

| Variables | | Odds ratios | Coefficients | Significance level |
|---|---|---|---|---|
| Type of position (base = Managing Director) | Electrician | 1.60 | 0.47 | 1 % |
| Treatment (base = control group) | Treatment group | 1.34 | 0.30 | n.s. |
| Interaction: type of position and treatment | Treatment group; Electrician | 1.20 | 0.19 | n.s. |
| ***Candidates' characteristics variables*** | | | | |
| Candidates experience (base = same experience for both candidates) | Older candidate has higher experience | 0.13 | - 2.03 | 1% |
| Interaction: experience and treatment | Treatment group; Older candidate has higher experience | 0.44 | - 0.81 | 1% |
| Candidates' recent training (base = both candidates did not have recent training) | Older candidate had recent training | 0.16 | - 1.85 | 1% |
| Interaction: training and treatment | Treatment group; both candidates did not have recent training | 1.68 | 0.52 | 10% |

| Variables | | Odds ratios | Coefficients | Significance level |
|---|---|---|---|---|
| Candidates' gender | Both females | 1.83 | 0.60 | 1% |
| | Younger male, older female | 2.12 | 0.75 | 1% |
| | Older male, younger female | 0.68 | - 0.39 | 10% |
| Interaction: candidates' gender and treatment | Both females | 0.82 | - 0.20 | n.s. |
| | Younger male, older female | 0.90 | - 0.11 | n.s. |
| | Older male, younger female | 0.47 | - 0.75 | 5% |
| ***Participants' characteristics variables*** | | | | |
| Participants' gender (base = female) | Male | 0.82 | - 0.20 | 10%. |
| Participants' age | | 0.99 | - 0.01 | n.s. |
| Personal professional experience with older workers (base = no experience) | Has some experience working with older people | 1.06 | 0.06 | n.s. |
| Knowledge about legislation against age discrimination in the labour market | | 0.80 | - 0.23 | n.s. |
| Father's age | | 1.09 | 0.08 | 5% |
| Mother's age | | 0.95 | - 0.06 | 10% |
| Father's employment status (base = unemployed/inactive) | Employed | 2.92 | 1.11 | 1% |
| Mother's employment status (base = unemployed/inactive) | Employed | 1.02 | 0.05 | n.s. |
| ***Participants' attitudes towards older workers variables*** | | | | |
| Who: | | | | |
| — is more productive (base = age is not important) | Younger than 50 | 0.98 | - 0.02 | n.s. |
| | Older than 50 | 1.16 | 0.11 | n.s. |
| — is more competent (base = age is not important) | Younger than 50 | 0.92 | 0.08 | n.s. |
| | Older than 50 | 0.74 | - 0.30 | n.s. |
| — is more responsible (base = age is not | Younger than 50 | 1.59 | 0.45 | n.s. |

| Variables | | Odds ratios | Coefficients | Significance level |
|---|---|---|---|---|
| important) | | | | |
| | Older than 50 | 0.87 | - 0.13 | n.s. |
| — takes more leaves due to illness (base = age is not important) | Younger than 50 | 0.66 | - 0.41 | n.s. |
| | Older than 50 | 1.75 | 0.55 | 5% |
| — is more prepared to work overtime (base = age is not important) | Younger than 50 | 0.83 | - 0.18 | n.s. |
| | Older than 50 | 1.11 | 0.10 | n.s. |
| — is better in group work (base = age is not important) | Younger than 50 | 1.36 | 0.31 | n.s. |
| | Older than 50 | 1.58 | 0.45 | n.s. |
| ***Participants' attitudes towards older people in general variables*** | | | | |
| Attitude (how they feel around older people) (base = neutral) | Positive | 0.74 | - 0.30 | n.s. |
| | Negative | 1.06 | 0.06 | n.s. |
| Characteristics (what they think about older people) (base = neutral) | Positive | 0.95 | - 0.06 | n.s. |
| | Negative | 0.61 | - 0.50 | 5% |
| Constant | | 0.92 | - 0.08 | n.s. |

As for the *Hypotheses 1 and 2*, we can conclude that the effect of position stays the same as in the Model 1, but the interaction with the treatment is not significant, i.e. the role of position does not depend on the treatment. This is not surprising as the treatment itself is not significant (see Table 16).

For *Hypothesis 3*, higher experience and existence of additional training for older candidates decreased the probability of younger candidates being chosen, i.e. we do not reject the hypothesis. There is also a significant effect of interaction between experience and treatment (Table 16) and training and treatment (Table 16).

However, for *Hypothesis 4*, we can see that treatment had practically no influence on the decisions made. When looking at the predictive margins, we can see that the confidence intervals overlap and, thus, the influence of treatment is barely noticeable (Figure 9 and Figure 10).

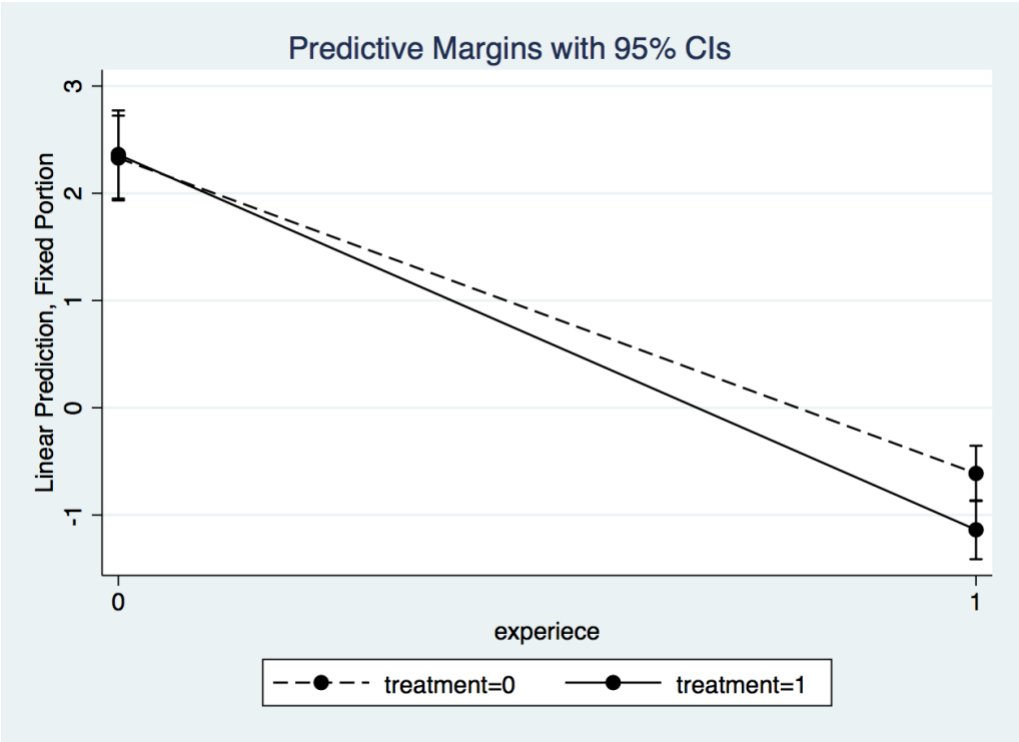


**Figure 9 — Predictive margins for experience and treatment, Model 2**

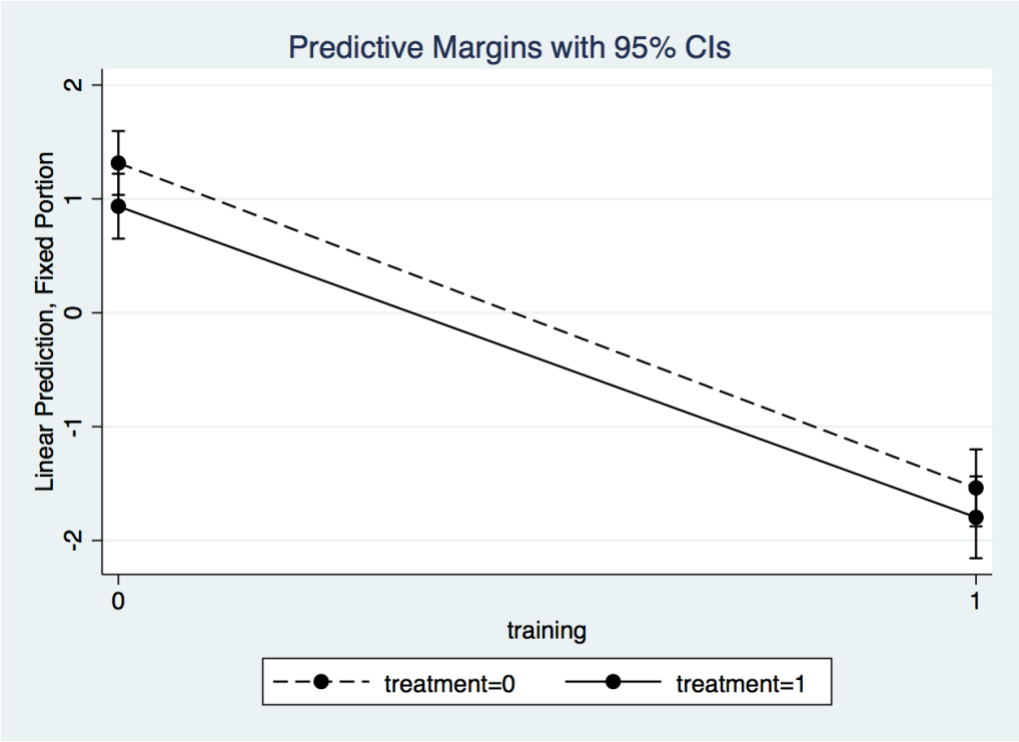


**Figure 10 — Predictive margins for training and treatment, Model 2**

The pure candidates' gender effect is also still significant (Table 16). According to the odds ratios, younger candidates were 1.83 times more likely to be chosen if both candidates are both female

compared to both males; 2.12 more likely if younger candidate was male and older was female and 0.68 less likely if younger candidate was female and older candidate was male at 1%, 1% and 10% respectively. When the interaction with the treatment was introduced the significance remained only for the last group, which we can also see in the Figure 11.

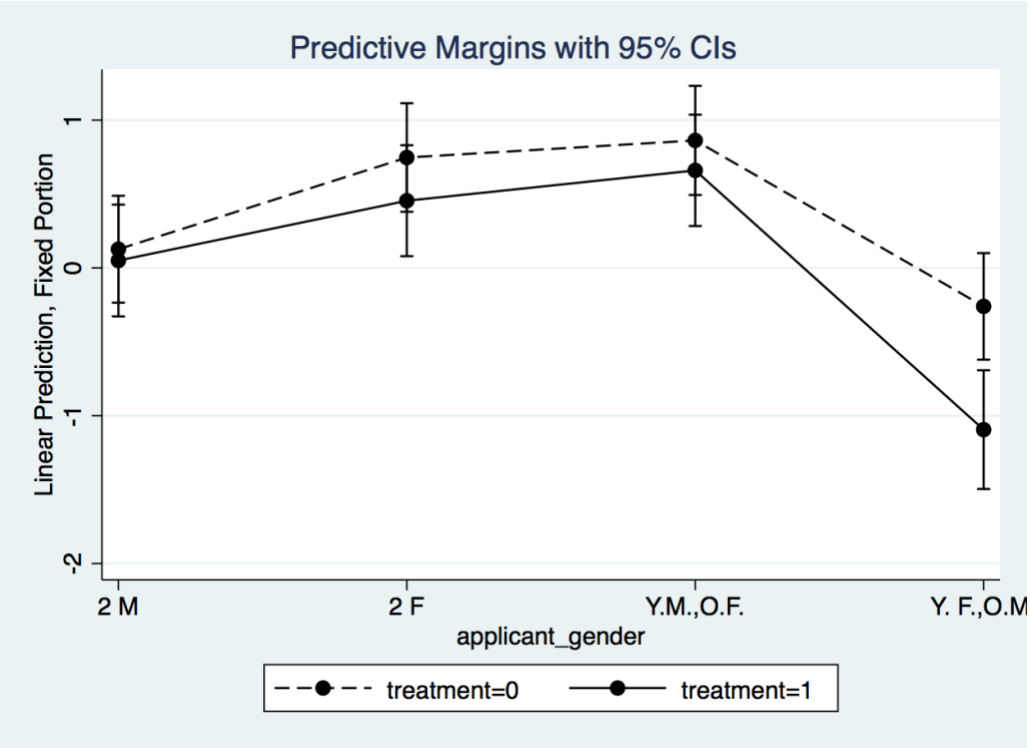


**Figure 11 — Predictive margins for applicant's gender and treatment, Model 2**

Most of other factors that could have influenced the decisions of the participants turned out to be insignificant or weakly significant (Table 16). Thus, gender of the participants is significant at 10% with male participants being 0.82 less likely to choose younger candidates than female participants. Father's age, which was between 44 and 73 with the mean of 56.5, and mother's age, which was between 41 and 68 with the mean 52.9, were significant at 5% and 10% respectively. The older the father, the higher was the probability of choosing younger candidate (1.09 times more likely). And, on the contrary, the older was the mother, the lower was the probability of choosing younger candidate (0.95 times less likely). Moreover, if the father was working, the participant was 2.92 times more likely to choose younger candidate. These results are hard to interpret as to better understand them it might be necessary to analyze family situations of the participants, delve more in the type of work that their parents were doing, see whether for some reasons for these participants their working or older fathers

represented some stereotypes about older people or whether those subjects held certain views about younger people being more apt in the job than older ones. This could be an important proof of the fact that the environment around the participants plays a crucial role in their actions. On the other hand, as these results (apart from the father's job) are very weakly significant and might not hold on bigger samples.

Among attitudes only two variables proved to be significant. Firstly, those who believed that older people took sick leaves more often, were 1.75 times more likely to choose younger candidates (5% significance). This goes in line with the previous research about older people being considered less healthy and less physically capable and, thus, being discriminated because of this stereotype. In addition to that those who, in general, characterized older people with negative adjectives to choose older candidates instead of young ones (0.61 times less likely to choose a young candidate). One of the explanations for this could be that "demanding" was coded as a negative trait. It has negative connotations in general but could prove useful in terms of working environment.

The main point of adding questions about attitudes of the participants towards older people was to try to distinguish between the two possible theories behind discrimination discussed in the first chapter: discrimination due to imperfect information in the labour market (i.e., statistical discrimination) and discrimination due to the cultural attitudes that consider "young" being better than "old" (i.e., tastes-based discrimination).

As we can see, personal attitudes did not influence the decisions a lot, moreover, certain negativity towards older people lead to an inverse effect — participants who chose adjectives with negative meaning tended to choose older candidates more often. On the other hand, objective characteristics, such as experience and training played in favour of older workers. Additionally, stereotypes about the type of the profession and about the health status of older workers decreased their chances of getting hired. Both seem to swing more towards imperfect information theory than towards cultural stereotypes that consider "youth" being better than "old age".

# Discussion and conclusion

In this chapter, we were studying discrimination among older workers (50+) through the use of laboratory experiment. Our aims were to see whether older people would be in any way disadvantaged compared to younger workers and, ideally, see whether discrimination played any role in this.

We had four hypotheses among which we found proof for the first three. As previous research suggested, type of job *(Hypotheses 1 and 2)* and experience *(Hypothesis 3)* had more influence on the hiring decisions than age. For the job that required more physical action and that could have been

considered too demanding for in this sense for older workers, the subjects indeed preferred to choose younger candidates. On the other hand, older workers stood much better chances with a non-physical job with executive functions.

We also showed the importance of on-going training *(Hypothesis 3)* for older workers that according to past research they are often denied (Adams, 2002; Cohn, 1982; Maxwell, 1989; O'Rand and MacLean, 1986) but that it is indispensable for them to stay competitive. Additionally, we saw that real discrimination happened only to those who at older age had the same experience as younger workers which is consistent with previous findings that we discussed in the first chapter (Baert et 1l., 2015). Otherwise, with proper experience and training older workers sometimes become even more competitive than younger workers, as our results suggest.

Social influence *(Hypothesis 4),* on the other hand, did not prove to play any role on the participants' decision. Responses of the control group were quite consistent with the responses of the treatment group which proves that the attitudes and the level of discrimination do not fluctuate due to exogenous forces as the participants already have views quite close to what they expected to be correct for the most of the people around them. It could mean that beliefs and attitudes regarding age are rather deeply settled inside of participants' mind and do not depend on additional exogenous stimulus and/or pressures.

We, however, find that family has a role in the decision-making that is hard to explain due to lack of details. Specifically, we see that the age of both parents and the employment status of the father had statistically significant influence on the decision-making which could mean that the environment and the beliefs ingrained through personal experience with the family members may have serious influence on the attitudes towards older and younger people's employment choices, even more so than some personal beliefs. Nevertheless, the mechanisms behind this influence are not clear from the results as more research is needed to uncover the specific details about the link that family environment had on the decisions-made.

Among possible stereotypes, only health stereotype proved to be significant and decreasing chances of older people to be hired. Personal attitudes towards older people did not have any negative influence on older people chances and certain negativity towards them, as being considered "demanding" actually played in their favour. This could be interpreted in favour of statistical discrimination rather than tastes-based one as only factors such as type of job that requires workers to be physically feat and worry about their health status actually decreased the chances of older people to be hired, i.e. it is probably based on the stereotype of older people being less healthy which is a belief that has ground based on the fact that people to become less healthy as they age. However, the reality is

such that it influences different people differently. Thus, basing hiring choice on an assumption about someone's health without any proof (such as a medical certificate) would be discriminatory because the employer would be using someone's age as a proxy. Nevertheless, as we said in the first chapter, this distinction in not ideal and may not cover all motivation behind the decisions made.

Another important factor which was not the focus of this research but still requires some discussion is gender. Women seemed to be more at risk regarding recruitment decisions regardless of their age, especially if it concerned a "male" profession (electrician), while for the managing director professional experience and training had more chances to outweigh gender bias. However, all other things held constant, men were preferred over women both in case of women being older and younger.

The results of the research point more towards discrimination due to imperfect information than towards cultural attitudes that picture "youth" as better than "older age".

All in all, the results of this research are useful for several reasons.

Firstly, we can see that discrimination of older people is more likely to happen in situations when they had long career breaks or spend a lot of time in another type of job. In this case, even if they had enough experience to fill the position a younger candidate with the same experience was likelier to get the position. Thus, the issues of unemployment need to be tackled already with the younger cohorts which raises the questions of youth unemployment issues that we slightly discussed in the first chapter. Unemployment at younger ages which often happens due to younger people lacking necessary experience or knowledge for the jobs may lead to the increased problems with discrimination of elderly workers in future.

Secondly, while we did not consider low-skilled job that required more physical work than knowledge and experience as some previous studies that we discussed in the first chapter (Riach, Rich, 2006, 2007), we can still see that a with job that is physically more tiresome is likelier to put older people at disadvantage. Mainly, as we can also see from our results due to the health stereotypes. Changing them requires good health care from one side and promotion of active ageing from the other.

Thirdly, the attitudes of employers who consider older workers not worthy of investment in terms of their training lead to older workers becoming incompatible in the labour market. And, as we saw, training is one of the crucial methods for tackling age discrimination in the labour market.

Fourthly, attitudes come as a result of environment and culture that may, at least partially, influence the decision-making. This, again, in the conditions of ageing population and decreasing birth rates, requires the promotion of active ageing and fight against stereotypes that follow older age.

Finally, our results show that Italy is not different from other countries in Europe in terms of attitudes towards older workers.

# Limitations and further research

This is an exploratory, for Italy especially, research which could benefit from a larger amount of participants and from experiment conducted with older participants who have more professional experience. In addition to that, it could benefit from more in-depth analysis of the influence of family factors on attitudes towards older workers, and from introduction of cognitive and/or psychological methods such as Implicit Association Test (IAT)[15], for example, aimed at identifying unconscious and automatic reaction to concepts (older age, in our case). This could help delve more in the motivation behind potentially discriminative actions and to extract motivations that support the theory about cultural attitudes towards older age. As of now, finding proof for it (if such kind of discrimination indeed exist) is rather difficult.

[15] Project Implicit, https://implicit.harvard.edu/implicit/

# Conclusion

This dissertation addressed issues of age discrimination of elderly workers in the labour market. This topic, as we have discussed in the first chapter, had received less attention than other forms of discrimination. This is due to the fact it has become really relevant only in the two-three decades when the society came to face with the situation of low birth rates, high life expectancy and, as a consequence, high dependency ratio. As a result, in most of the countries the retirement age was raised which resulted in the increased of the number older workers in the labour market.

As was shown in the first chapter, there is substantial proof that older workers face discrimination in different countries due to their age as they are often considered not motivated enough, too old for the firms to invest in their training or too old to be able to learn new methods of work (e.g., Riach, Rich, 2007). And past research does show that with time cognitive and physical abilities tend to deteriorate (e.g., Zancada-Menendez, 2015, Federmeier, Kutas, Schul, 2010; Rosenblum, Enger-Yeger, Fogel, 2013, etc.). However, the research also shows that older people can find ways to deal with their shortcomings (e.g., Chaparro et al, 1999; Brooks et al, 2001) or even more — that their productivity does not suffer because of their age (Warr, 1994; Rhodes, 1983; McEvoy, Cascio, 1989; Bennington, Tharenou, 1996) or is even better than that of younger workers (e.g., Fyock, 1991; Rhodes, 1983). However, there is a lot of proof of older people being discriminated (e.g., Hassell, Perrewé, 1983; Kalish, Williams, 1983; Duncan, Loretto, 2004; Furunes, Mykletun, 2010; Riach, 2015).

When analyzing definitions, types and different theories behind age discrimination, we came to a conclusion that distinguishing between real discrimination and inequality that arises from objective facts is not a straightforward task. There are many theories as to why older people end in an unfavourable position but whether they are discriminated or not depends a lot on the reasoning behind the decisions made employers. There are, however, two theories that we pinpointed as "purely discriminative". The first one is the theory about imperfect information in the labour market which could be also considered statistical discrimination (defined by Arrow, 1973; Aigner, Cain, 1977, etc.). The second one is the theory about cultural attitudes that consider "being young" a positive thing and "being old" a negative one. This one can be regarded as tasted-based discrimination (defined by Becker, 1971). We discussed that understanding what lies behind discriminatory or seemingly discriminatory actions is important as it is makes it easier to find ways to tackle discrimination.

However, as was already said, understanding these mechanisms is difficult and the current methods of studies are not optimal to achieve the necessary result (Lucas, 2008, 2013).

Still, after presenting and analyzing the different approaches to studying discrimination, we settled that experimental and quasi-experimental approach can help us better, than other ones, in our attempts to shed light on these issues as they allow us to minimize the effects of unobservable variables and to focus only on the variables that matter for our study.

Thus, in the second chapter we focused on the role of anti-discriminatory legislation that was introduced in Italy in 2003. Through the quasi-experimental, difference-in-difference approach we achieved to aims. Firstly, we proved that existence of the effect of this legislation on the probability of older workers to be employed. Secondly, through this, we indirectly showed that discrimination against older does exist in Italy. While in this study we could not look at the motivations behind these decisions, we, however, were able to prove the existence of the issue and the fact that legislation aimed at tackling them are needed and can function. However, in this chapter we also saw that the increased retirement age had a bigger role than anti-discriminatory legislation.

In the third chapter, we addressed the more subtle sides of discrimination by running a laboratory experiment that simulated a hiring situation among students in the University of Brescia and to speculate about the two age discrimination theories behind decision-making. We were able to determine that older workers were severely disadvantaged than younger workers if younger and older workers had the same level of experience. They ended, however, even in a better position than younger workers if they had more experience and had proof of undergoing additional professional training in recent years. We have also seen that proof that older women faced higher discriminatory risks than men.

However, we could also see that experience and up-to-date training played a very important role in decision-making, which means that older workers have a much higher chances in the labour market if they keep their professionalism on the level required by the labour market.

We were able to touch upon motivations behind decisions, even though this pilot research, in this domain, raised more questions than answers. The environmental, in our case, family factors such as parent's age and employment status, had significant influence on the decisions. However, the mechanisms behind them are unclear and require more research.

While we were not able to find connection between decisions made and personal (positive or negative) attitudes towards older people or most of the stereotypes regarding old age, we could see that health stereotypes had influence on the decisions. Those participants who considered older people less healthy were more prone to choose younger candidates. In favour of the existence of this stereotype works also the fact that the type of job turned out significant:

electricians had higher probability of not being hired at older age than managing directors, and electrician requires to do more physical work that managing directors.

The introduction of social influence in the laboratory experiment allowed us to see that the decisions made by treatment group (who was subjected to the pressure of making decisions that would be as close as possible to the decisions made previous by their peers) and control group (who was not subjected to this pressure) did not have any significant differences. This allowed us to indirectly conclude that the level of discrimination did not depend on any additional open pressure. The attitude of participants towards older and younger workers was already ingrained in their minds. However, we cannot state that these attitudes were due to disliked towards older people in general. None of the questionnaire responses allow for this explanation. Moreover, had the theory of cultural dislike towards older people been a relevant explanation, the tendency towards choosing younger people would have been much more prominent also in the situations when older people were more experienced than younger ones. However, this was not the case. The theory of imperfect information, though, would seem to fit as a better explanation. The participants did not know what were the reasons behind older people having the same level of experience as younger ones, they did not have enough information and, probably, just went with a safer solution.

Additionally, health stereotypes (although obviously based on the real fact the health does deteriorate with age) were more in line with the theory of imperfect information. In our experiment, we did not provide the participants with information about the candidate's health status. Thus, they, apparently, made assumptions based on their own understanding and general knowledge they had.

While this study allowed us to understand a bit more about the process of decision-making when hiring people of different ages, including the role of norms and stereotypes, there is a lot to be gained when conducting further research.

More studies are necessary to understand the mechanisms behind these decisions, especially the more subjective ones, such as environmental role and subconscious attitudes that are hard to uncover with questionnaires. For example, cognitive approach towards prejudiced and discriminatory attitudes could benefit further studies a lot. The addition of Harvard Implicit Association Test that relates to intergroup discrimination or to explicit measures of prejudice to such an experiment would help uncover more about the unconscious attitudes towards older people and their connection to decision-making.

Farther research would also benefit from the repetition of the experimental study with older, more experienced in the job market, participants to see whether their responses will not differ from the responses of younger participants and if they will — in which form.

Additional studies of legislation may be a good idea in order to see that other laws influenced decisions regarding older workers. In our study, we only considered the role of retirement policies. However, there definitely exist other laws concerning labour market that could create room for discrimination or for protection against it and have an indirect effect on the employment situation of older workers.

All in all, our research allowed us to conclude that certain level of discrimination does exist against older workers in the labour market in Italy and that the factors influencing the situation of older workers have both discriminatory and non-discriminatory roots. More studies of environmental factors and motivations behind decisions to further disentangle the finer specifics of the phenomenon.

Moreover, the results show three directions in which actions aimed at tackling discrimination could go.

Firstly, the legislations against discrimination do have effect. However, a more in-depth approach could benefit future legislations.

Secondly, experience and training do have effect that outweighs the effect of age. Thus, the future problems of older workers (whose share will continue to increase with time) can be tackled by already addressing the issues of employment of younger people.

Thirdly, positive image of ageing is necessary, as proven by past studies, being older does not mean incapable. Creating a more positive image of ageing, as well as helping older people by providing them with necessary training and devices that could help tackle age related problems could seriously improve their productivity and competitiveness in the labour market.

All in all, this research provides useful insight into the existence of age discrimination and possible mechanisms behind it with more in-depth analysis than was done before, especially for Italian situation.

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# Appendix 1 — Chapter 2. Missing values

**Table 17 — Missing or removed for other reasons cases (Model 1)**

| | All cases | Treatment | Outcome variable (with normally retired) | Education and training | Sector | ISCO |
|---|---|---|---|---|---|---|
| 1992 | 201,007 | 175,184 | 945 | 0 | 6,095 | 156 |
| 1993 | 200,550 | 174,584 | 998 | 0 | 6,380 | 146 |
| 1994 | 198,935 | 172,896 | 1,045 | 0 | 6,348 | 155 |
| 1995 | 203,434 | 176,422 | 1,121 | 0 | 6,394 | 167 |
| 1996 | 202,432 | 175,350 | 1,139 | 0 | 6,349 | 184 |
| 1997 | 201,541 | 173,885 | 1,203 | 0 | 6,362 | 192 |
| 1998 | 201,835 | 174,289 | 408 | 876 | 6,373 | 927 |
| 1999 | 200,625 | 172,869 | 408 | 777 | 6,370 | 898 |
| 2000 | 199,367 | 171,670 | 401 | 738 | 6,509 | 0 |
| 2001 | 196,236 | 169,309 | 404 | 0 | 6,710 | 179 |
| 2002 | 194,041 | 166,840 | 416 | 0 | 6,776 | 172 |
| 2003 | 192,359 | 164,886 | 410 | 0 | 6,760 | 198 |
| 2004 | 172,264 | 147,577 | 475 | 138 | 5,527 | 209 |
| 2005 | 704,372 | 602,298 | 1,853 | 992 | 22,115 | 727 |
| 2006 | 684,303 | 586,219 | 1,816 | 183 | 20,884 | 623 |
| 2007 | 677,746 | 582,386 | 1,783 | 139 | 19,493 | 579 |
| 2008 | 671,939 | 579,255 | 1,794 | 343 | 18,504 | 572 |
| 2009 | 659,561 | 570,265 | 1,754 | 200 | 17,331 | 553 |
| 2010 | 662,986 | 574,021 | 1,624 | 273 | 16,730 | 572 |
| 2011 | 657,569 | 571,443 | 1,497 | 244 | 16,290 | 523 |
| 2012 | 606,972 | 527,304 | 1,332 | 255 | 13,775 | 574 |
| 2013 | 611,255 | 531,373 | 1,319 | 247 | 13,685 | 536 |
| 2014 | 604,580 | 526,846 | 1,339 | 660 | 13,479 | 525 |
| 2015 | 597,872 | 522,283 | 1,365 | 580 | 12,913 | 589 |
| 2016 | 584,571 | 510,831 | 1,368 | 422 | 12,443 | 671 |
| Total | 10,288,352 | 8,900,285 | 28,217 | 7,067 | 280,595 | 10,627 |

**Table 18 — Missing or removed for other reasons variables (Model 2)**

| | All cases | Treatment | Outcome variable (without normally retired) | Education and training | Sector | ISCO |
|---|---|---|---|---|---|---|
| 1992 | 201,007 | 175,184 | 2,603 | 0 | 6,095 | 130 |
| 1993 | 200,550 | 174,584 | 2,700 | 0 | 6,380 | 123 |
| 1994 | 198,935 | 172,896 | 3,008 | 0 | 6,348 | 132 |
| 1995 | 203,434 | 176,422 | 3,424 | 0 | 6,394 | 128 |
| 1996 | 202,432 | 175,350 | 3,492 | 0 | 6,349 | 149 |
| 1997 | 201,541 | 173,885 | 3,820 | 0 | 6,362 | 167 |
| 1998 | 201,835 | 174,289 | 2,966 | 772 | 6,373 | 822 |

| | All cases | Treatment | Outcome variable (without normally retired) | Education and training | Sector | ISCO |
|---|---|---|---|---|---|---|
| 1999 | 200,625 | 172,869 | 2,859 | 697 | 6,370 | 802 |
| 2000 | 199,367 | 171,670 | 2,662 | 686 | 6,509 | 0 |
| 2001 | 196,236 | 169,309 | 2,550 | 0 | 6,710 | 179 |
| 2002 | 194,041 | 166,840 | 2,476 | 0 | 6,776 | 172 |
| 2003 | 192,359 | 164,886 | 2,450 | 0 | 6,760 | 198 |
| 2004 | 172,264 | 147,577 | 2,527 | 133 | 5,527 | 177 |
| 2005 | 704,372 | 602,298 | 10,095 | 937 | 22,115 | 627 |
| 2006 | 684,303 | 586,219 | 9,752 | 173 | 20,884 | 548 |
| 2007 | 677,746 | 582,386 | 9,334 | 135 | 19,493 | 498 |
| 2008 | 671,939 | 579,255 | 7,906 | 338 | 18,504 | 512 |
| 2009 | 659,561 | 570,265 | 6,548 | 200 | 17,331 | 485 |
| 2010 | 662,986 | 574,021 | 5,779 | 272 | 16,730 | 477 |
| 2011 | 657,569 | 571,443 | 4,850 | 244 | 16,290 | 416 |
| 2012 | 606,972 | 527,304 | 3,699 | 254 | 13,775 | 442 |
| 2013 | 611,255 | 531,373 | 3,426 | 247 | 13,685 | 401 |
| 2014 | 604,580 | 526,846 | 2,982 | 652 | 13,479 | 392 |
| 2015 | 597,872 | 522,283 | 2,899 | 572 | 12,913 | 410 |
| 2016 | 584,571 | 510,831 | 2,834 | 419 | 12,443 | 487 |
| Total | 10,288,352 | 8,900,285 | 107,641 | 6,731 | 280,595 | 8,874 |

# Appendix 2 — Chapter 2. Descriptive statistics

**Table 19 — Gender by age cohort, year and Model, %, 1992-2016**

| | Model 1 (with normally retired) | | | | Model 2(without normally retired) | | | |
|---|---|---|---|---|---|---|---|---|
| | 35-39 | | 55-59 | | 35-39 | | 55-59 | |
| Year | female | male | female | male | female | male | female | male |
| 1992 | 40.4 | 59.6 | 33.0 | 67.0 | 40.3 | 59.7 | 29.2 | 70.8 |
| 1993 | 40.2 | 59.8 | 32.8 | 67.2 | 40.1 | 59.9 | 29.4 | 70.6 |
| 1994 | 39.7 | 60.3 | 33.3 | 66.7 | 39.7 | 60.3 | 30.2 | 69.8 |
| 1995 | 40.8 | 59.2 | 34.0 | 66.0 | 40.8 | 59.2 | 31.4 | 68.6 |
| 1996 | 41.2 | 58.8 | 33.8 | 66.2 | 41.2 | 58.8 | 32.2 | 67.8 |
| 1997 | 41.2 | 58.8 | 33.1 | 66.9 | 41.2 | 58.8 | 33.3 | 66.7 |
| 1998 | 41.4 | 58.6 | 33.6 | 66.4 | 41.4 | 58.6 | 35.3 | 64.7 |
| 1999 | 42.3 | 57.7 | 33.6 | 66.4 | 42.3 | 57.7 | 35.1 | 64.9 |
| 2000 | 42.6 | 57.4 | 32.8 | 67.2 | 42.6 | 57.4 | 35.0 | 65.0 |
| 2001 | 43.6 | 56.4 | 33.3 | 66.7 | 43.6 | 56.4 | 35.6 | 64.4 |
| 2002 | 42.4 | 57.6 | 34.0 | 66.0 | 42.4 | 57.6 | 36.5 | 63.5 |
| 2003 | 43.9 | 56.1 | 34.1 | 65.9 | 43.9 | 56.1 | 36.5 | 63.5 |
| 2004 | 45.4 | 54.6 | 35.9 | 64.1 | 45.4 | 54.6 | 39.4 | 60.6 |
| 2005 | 45.9 | 54.1 | 36.7 | 63.3 | 45.9 | 54.1 | 39.9 | 60.1 |
| 2006 | 46.1 | 53.9 | 37.2 | 62.8 | 46.1 | 53.9 | 39.9 | 60.1 |
| 2007 | 46.5 | 53.5 | 38.2 | 61.8 | 46.5 | 53.5 | 40.7 | 59.3 |
| 2008 | 46.5 | 53.5 | 39.4 | 60.6 | 46.5 | 53.5 | 41.0 | 59.0 |
| 2009 | 46.7 | 53.3 | 40.5 | 59.5 | 46.7 | 53.3 | 41.8 | 58.2 |
| 2010 | 46.7 | 53.3 | 41.6 | 58.4 | 46.7 | 53.3 | 42.5 | 57.5 |
| 2011 | 46.5 | 53.5 | 42.0 | 58.0 | 46.5 | 53.5 | 43.1 | 56.9 |
| 2012 | 47.1 | 52.9 | 42.4 | 57.6 | 47.1 | 52.9 | 43.1 | 56.9 |
| 2013 | 47.6 | 52.4 | 43.0 | 57.0 | 47.6 | 52.4 | 43.7 | 56.3 |
| 2014 | 47.8 | 52.2 | 43.7 | 56.3 | 47.8 | 52.2 | 44.0 | 56.0 |
| 2015 | 48.3 | 51.7 | 44.4 | 55.6 | 48.3 | 51.7 | 44.6 | 55.4 |
| 2016 | 47.7 | 52.3 | 45.2 | 54.8 | 47.7 | 52.3 | 45.2 | 54.8 |

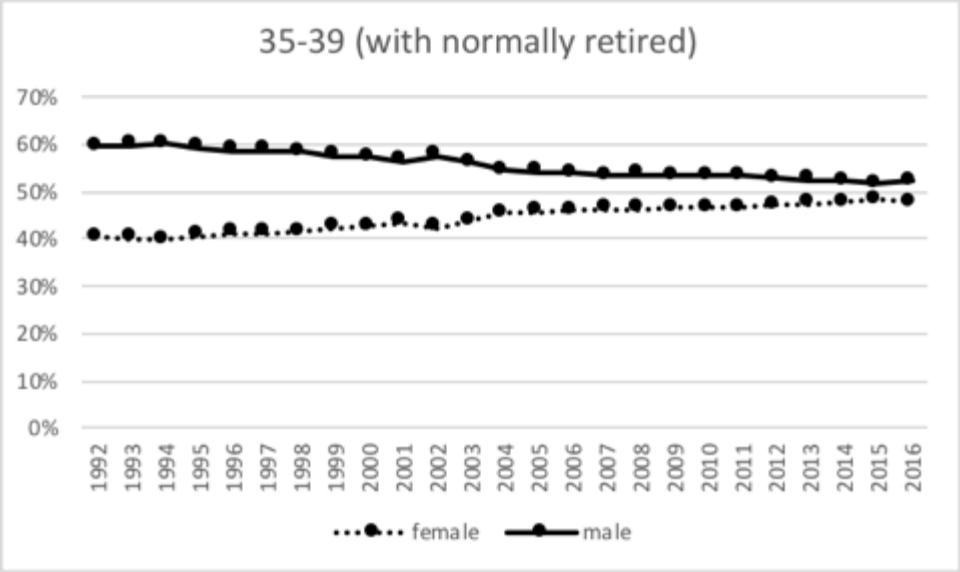


**Figure 12 — Gender, 35-39 age cohort, Model 1, by year, %, 1992-2016**

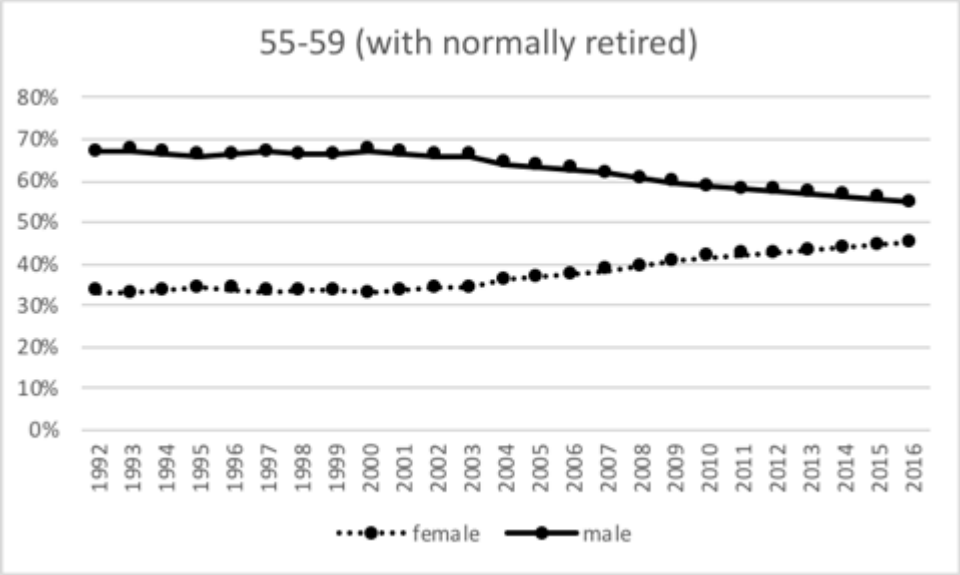


**Figure 13 — Gender, 55-59 age cohort, Model 1, by year, %, 1992-2016**

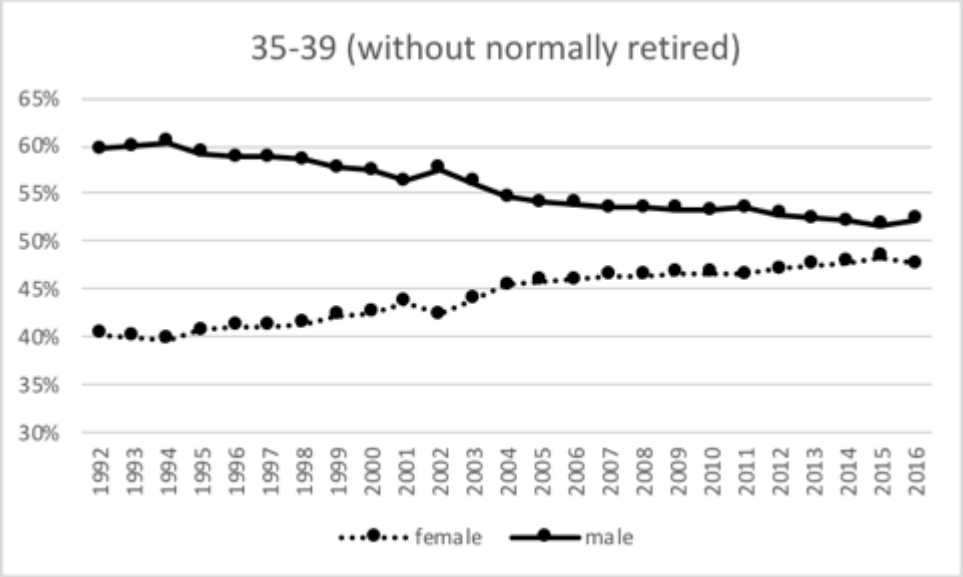


**Figure 14 — Gender, 35-39 age cohort, Model 2, by year, %, 1992-2016**

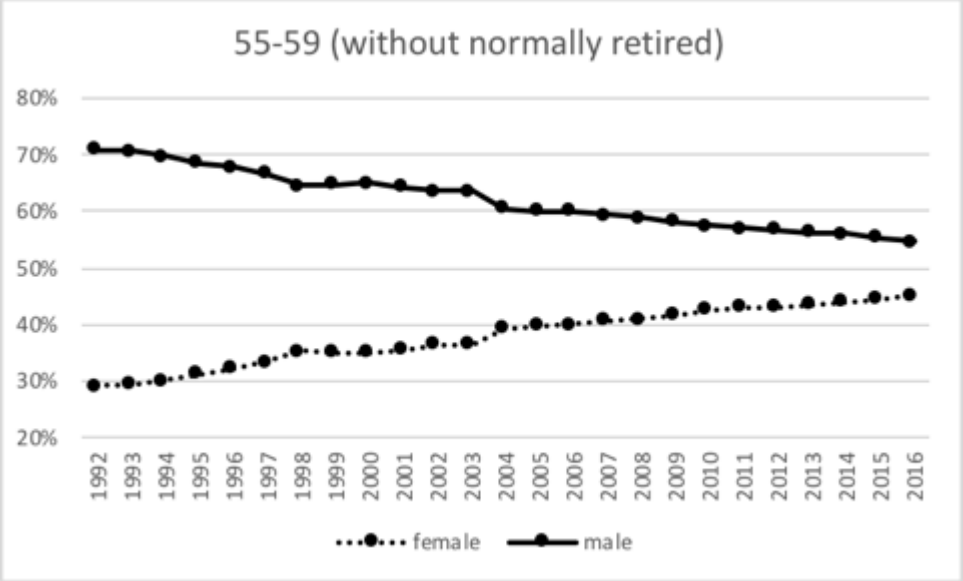


**Figure 15 — Gender, 55-39 age cohort, Model 2, by year, %, 1992-2016**

**Table 20 — The distribution of the sample by level of education by age cohorts and year Model 1 (with normally retired), %, 1992-2016**

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Lower secondary | Upper secondary | Tertiary | Lower secondary | Upper secondary | Tertiary |
| 1992 | 51.1 | 36.7 | 12.2 | 80.8 | 14.0 | 5.2 |
| 1993 | 50.5 | 37.9 | 11.6 | 81.1 | 14.0 | 4.9 |
| 1994 | 48.9 | 39.4 | 11.7 | 78.8 | 15.5 | 5.7 |
| 1995 | 47.0 | 40.9 | 12.1 | 76.2 | 17.8 | 6.0 |

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Lower secondary | Upper secondary | Tertiary | Lower secondary | Upper secondary | Tertiary |
| 1996 | 47.1 | 40.9 | 12.0 | 73.8 | 19.8 | 6.3 |
| 1997 | 44.2 | 44.0 | 11.7 | 72.9 | 20.6 | 6.5 |
| 1998 | 44.9 | 43.0 | 12.2 | 72.7 | 19.6 | 7.7 |
| 1999 | 45.6 | 42.2 | 12.2 | 70.2 | 21.1 | 8.7 |
| 2000 | 43.5 | 44.9 | 11.7 | 68.0 | 23.7 | 8.3 |
| 2001 | 45.8 | 42.1 | 12.1 | 68.6 | 22.3 | 9.1 |
| 2002 | 45.2 | 42.2 | 12.6 | 66.1 | 23.7 | 10.2 |
| 2003 | 43.4 | 43.3 | 13.3 | 63.4 | 26.2 | 10.4 |
| 2004 | 43.4 | 43.6 | 13.0 | 62.3 | 26.9 | 10.8 |
| 2005 | 41.9 | 43.8 | 14.2 | 59.8 | 28.4 | 11.8 |
| 2006 | 40.8 | 44.0 | 15.2 | 57.5 | 30.4 | 12.2 |
| 2007 | 39.4 | 44.2 | 16.3 | 56.0 | 31.0 | 13.1 |
| 2008 | 37.8 | 44.6 | 17.7 | 54.2 | 32.3 | 13.5 |
| 2009 | 35.8 | 45.9 | 18.2 | 52.3 | 33.7 | 14.0 |
| 2010 | 34.8 | 46.7 | 18.6 | 49.6 | 35.8 | 14.6 |
| 2011 | 33.9 | 47.1 | 19.0 | 48.4 | 37.1 | 14.5 |
| 2012 | 32.4 | 47.5 | 20.1 | 47.3 | 38.1 | 14.7 |
| 2013 | 31.0 | 47.9 | 21.2 | 46.0 | 39.0 | 15.0 |
| 2014 | 29.5 | 48.7 | 21.8 | 44.1 | 41.0 | 14.9 |
| 2015 | 29.0 | 47.6 | 23.4 | 43.3 | 42.2 | 14.5 |
| 2016 | 28.7 | 47.8 | 23.5 | 42.8 | 42.5 | 14.7 |

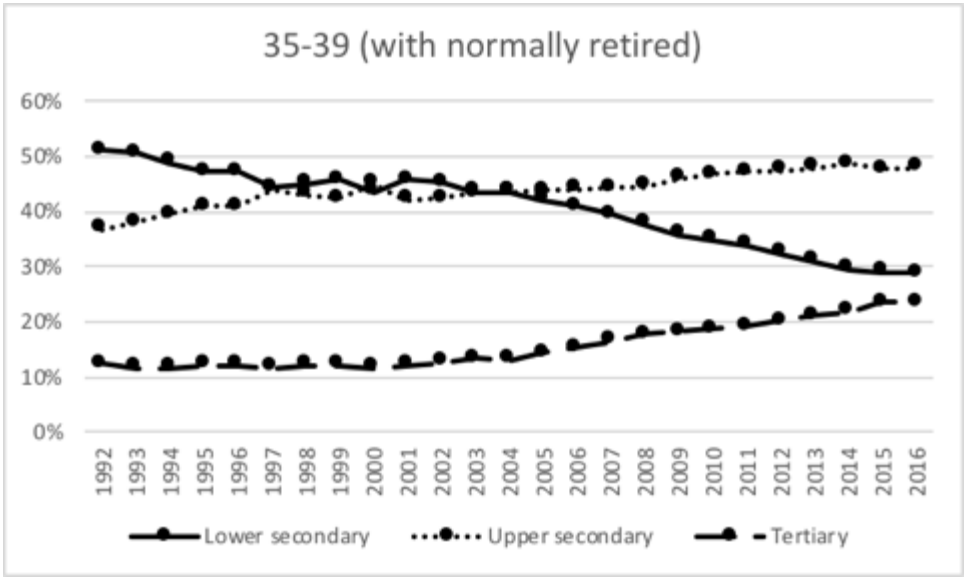


**Figure 16 — The distribution of the sample by level of education, 35-39 age cohort by year, Model 1, %, 1992-2016**

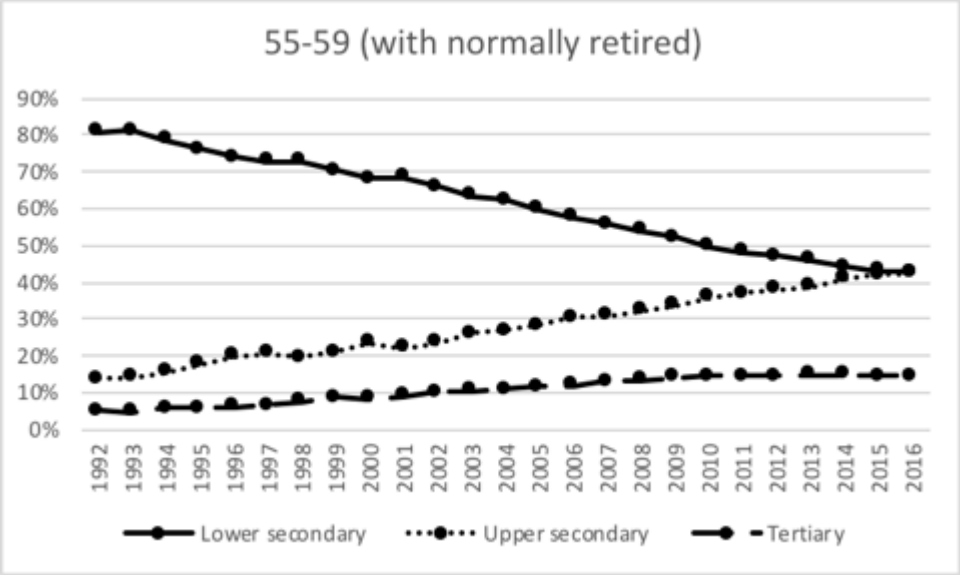


**Figure 17 — The distribution of the sample by level of education, 55-59 age cohort by year, Model 1, %, 1992-2016**

**Table 21 — The distribution of the sample by level of education by age cohorts and year Model 2 (without normally retired), %, 1992-2016**

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Lower secondary | Upper secondary | Tertiary | Lower secondary | Upper secondary | Tertiary |
| 1992 | 51.1 | 36.7 | 12.3 | 79.4 | 14.6 | 6.0 |
| 1993 | 50.5 | 37.9 | 11.6 | 79.6 | 14.7 | 5.7 |
| 1994 | 48.9 | 39.4 | 11.7 | 76.9 | 16.2 | 6.8 |
| 1995 | 47.0 | 40.9 | 12.1 | 74.2 | 18.7 | 7.1 |
| 1996 | 47.1 | 40.9 | 12.0 | 71.2 | 21.1 | 7.7 |
| 1997 | 44.2 | 44.0 | 11.7 | 69.7 | 22.1 | 8.2 |
| 1998 | 44.8 | 43.0 | 12.2 | 69.7 | 21.2 | 9.1 |
| 1999 | 45.6 | 42.2 | 12.2 | 68.0 | 21.9 | 10.1 |
| 2000 | 43.4 | 44.9 | 11.7 | 65.6 | 24.8 | 9.6 |
| 2001 | 45.8 | 42.1 | 12.1 | 65.9 | 23.4 | 10.8 |
| 2002 | 45.2 | 42.2 | 12.6 | 63.4 | 24.7 | 11.9 |
| 2003 | 43.4 | 43.3 | 13.3 | 60.3 | 27.5 | 12.2 |
| 2004 | 43.4 | 43.6 | 13.0 | 58.9 | 28.5 | 12.5 |
| 2005 | 41.9 | 43.9 | 14.2 | 56.2 | 29.8 | 14.0 |
| 2006 | 40.8 | 44.0 | 15.2 | 54.0 | 31.7 | 14.3 |

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Lower secondary | Upper secondary | Tertiary | Lower secondary | Upper secondary | Tertiary |
| 2007 | 39.4 | 44.2 | 16.3 | 52.7 | 32.3 | 15.0 |
| 2008 | 37.8 | 44.6 | 17.7 | 51.3 | 33.7 | 15.0 |
| 2009 | 35.8 | 45.9 | 18.2 | 49.7 | 35.1 | 15.3 |
| 2010 | 34.8 | 46.7 | 18.6 | 47.1 | 37.1 | 15.8 |
| 2011 | 33.9 | 47.1 | 19.0 | 45.6 | 38.7 | 15.6 |
| 2012 | 32.4 | 47.5 | 20.1 | 45.1 | 39.3 | 15.6 |
| 2013 | 31.0 | 47.9 | 21.2 | 44.1 | 40.0 | 15.9 |
| 2014 | 29.5 | 48.6 | 21.8 | 42.6 | 41.8 | 15.6 |
| 2015 | 29.0 | 47.6 | 23.4 | 42.1 | 42.9 | 15.0 |
| 2016 | 28.7 | 47.8 | 23.5 | 41.8 | 43.1 | 15.1 |

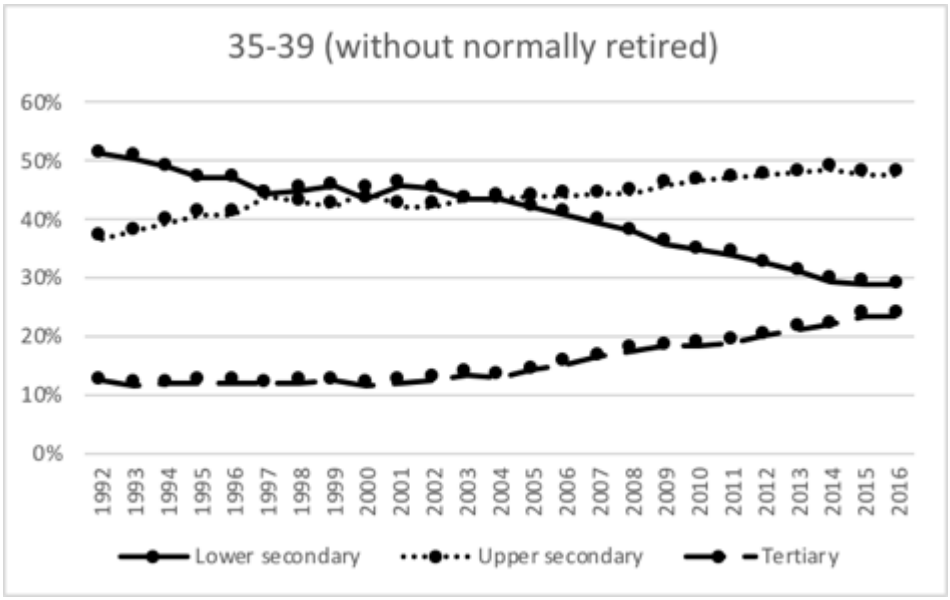


**Figure 18 — The distribution of the sample by level of education, 35-39 age cohort by year, Model 2, %, 1992-2016**

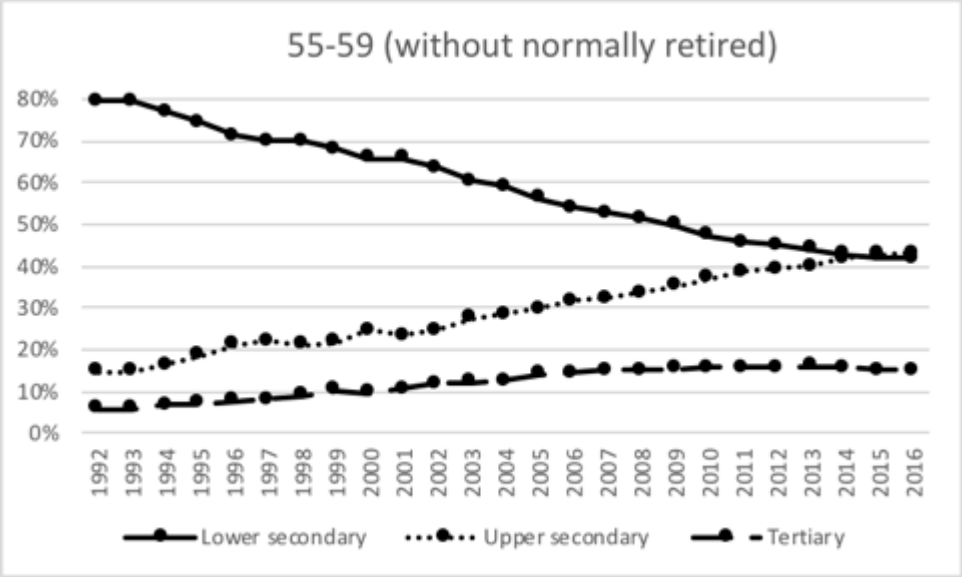


**Figure 19 — The distribution of the sample by level of education, 55-59 age cohort by year, Model 2, %, 1992-2016**

**Table 22 — The distribution of the sample by existence of additional training in the last 4 weeks by age cohorts, year and Model, %, 1992-2016**

| | With normally retired | | | | Without normally retired | | | |
|---|---|---|---|---|---|---|---|---|
| | 35-39 | | 55-59 | | 35-39 | | 55-59 | |
| Year | No training | Training | No training | Training | No training | Training | No training | Training |
| 1992 | 97.6 | 2.4 | 99.4 | 0.6 | 97.6 | 2.4 | 99.2 | 0.8 |
| 1993 | 97.3 | 2.7 | 99.2 | 0.8 | 97.3 | 2.7 | 99.2 | 0.8 |
| 1994 | 97.2 | 2.8 | 99.4 | 0.6 | 97.2 | 2.8 | 99.3 | 0.7 |
| 1995 | 97.0 | 3.0 | 99.1 | 0.9 | 97.0 | 3.0 | 98.9 | 1.1 |
| 1996 | 96.6 | 3.4 | 98.9 | 1.1 | 96.6 | 3.4 | 98.6 | 1.4 |
| 1997 | 96.2 | 3.8 | 98.8 | 1.2 | 96.2 | 3.8 | 98.6 | 1.4 |
| 1998 | 96.0 | 4.0 | 98.6 | 1.4 | 96.0 | 4.0 | 98.2 | 1.8 |
| 1999 | 94.9 | 5.1 | 98.0 | 2.0 | 94.9 | 5.1 | 97.6 | 2.4 |
| 2000 | 95.2 | 4.8 | 98.4 | 1.6 | 95.2 | 4.8 | 98.3 | 1.7 |
| 2001 | 95.6 | 4.4 | 98.6 | 1.4 | 95.6 | 4.4 | 98.2 | 1.8 |
| 2002 | 96.4 | 3.6 | 98.6 | 1.4 | 96.4 | 3.6 | 98.4 | 1.6 |
| 2003 | 96.5 | 3.5 | 98.3 | 1.7 | 96.5 | 3.5 | 98.3 | 1.7 |
| 2004 | 93.8 | 6.2 | 96.9 | 3.1 | 93.8 | 6.2 | 96.2 | 3.8 |
| 2005 | 94.7 | 5.3 | 97.4 | 2.6 | 94.7 | 5.3 | 97.0 | 3.0 |
| 2006 | 94.3 | 5.7 | 97.2 | 2.8 | 94.3 | 5.7 | 96.7 | 3.3 |
| 2007 | 94.0 | 6.0 | 96.9 | 3.1 | 94.0 | 6.0 | 96.4 | 3.6 |

| | With normally retired | | | | Without normally retired | | | |
|---|---|---|---|---|---|---|---|---|
| | 35-39 | | 55-59 | | 35-39 | | 55-59 | |
| Year | No training | Training | No training | Training | No training | Training | No training | Training |
| 2008 | 93.9 | 6.1 | 96.4 | 3.6 | 93.9 | 6.1 | 95.8 | 4.2 |
| 2009 | 94.5 | 5.5 | 96.5 | 3.5 | 94.5 | 5.5 | 96.2 | 3.8 |
| 2010 | 94.3 | 5.7 | 96.2 | 3.8 | 94.3 | 5.7 | 95.8 | 4.2 |
| 2011 | 94.8 | 5.2 | 96.5 | 3.5 | 94.8 | 5.2 | 96.3 | 3.7 |
| 2012 | 93.7 | 6.3 | 95.5 | 4.5 | 93.7 | 6.3 | 95.3 | 4.7 |
| 2013 | 94.0 | 6.0 | 95.7 | 4.3 | 94.0 | 6.0 | 95.6 | 4.4 |
| 2014 | 92.0 | 8.0 | 93.6 | 6.4 | 92.0 | 8.0 | 93.4 | 6.6 |
| 2015 | 92.8 | 7.2 | 94.2 | 5.8 | 92.8 | 7.2 | 94.1 | 5.9 |
| 2016 | 91.8 | 8.2 | 92.9 | 7.1 | 91.8 | 8.2 | 92.8 | 7.2 |

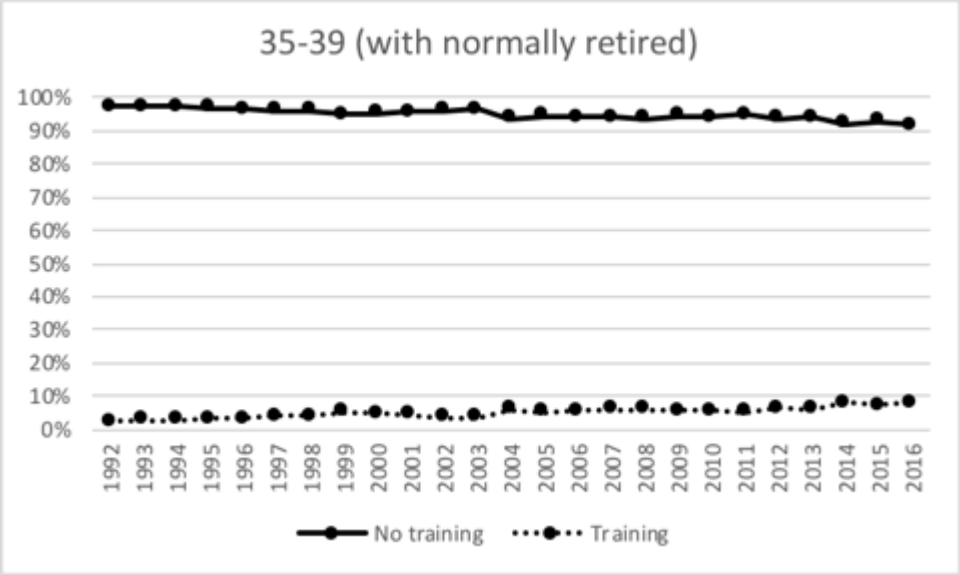


**Figure 20 — The distribution of the sample by those who had and did not have additional training in the last 4 weeks, 35-39 cohort by year, Model 1, %, 1992-2016**

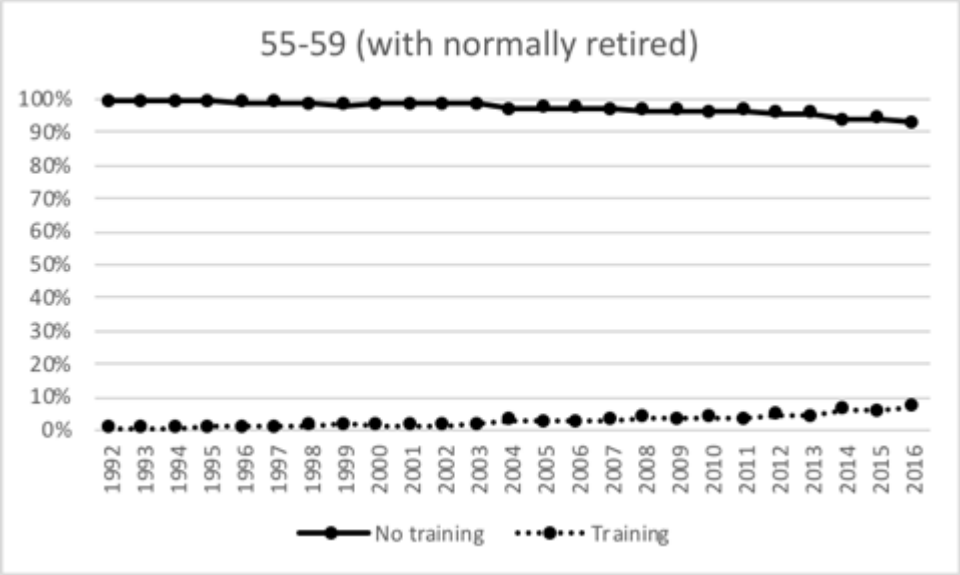


**Figure 21 — The distribution of the sample by those who had and did not have additional training in the last 4 weeks, 55-59 cohort by year, Model 1, %, 1992-2016**

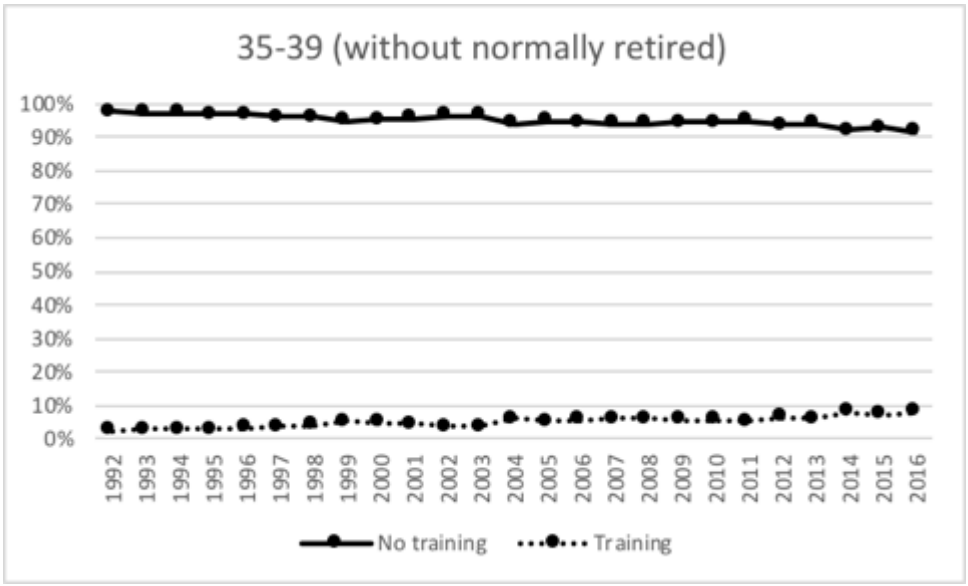


**Figure 22 — The distribution of the sample by those who had and did not have additional training in the last 4 weeks, 35-39 cohort by year, Model 2, %, 1992-2016**

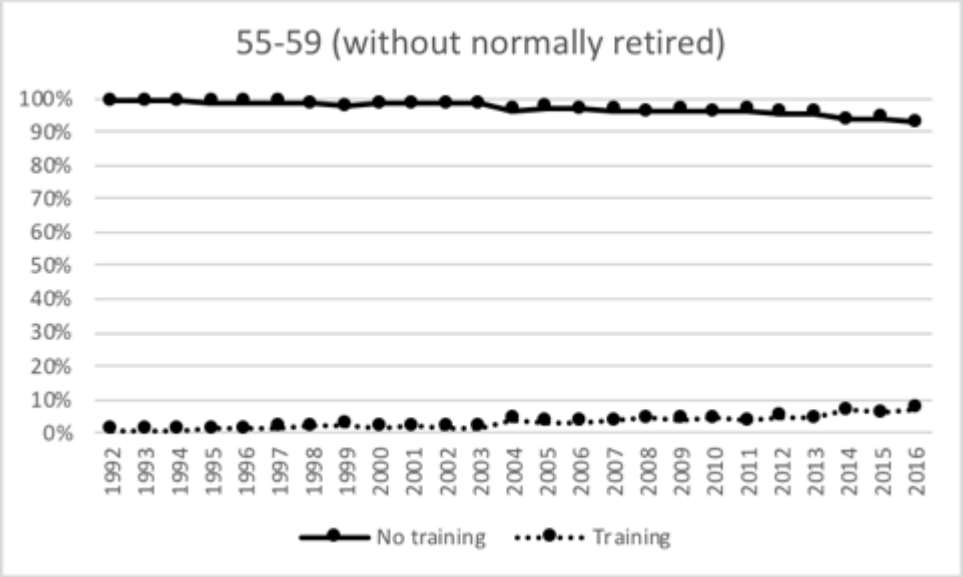


**Figure 23 — The distribution of the sample by those who had and did not have additional training in the last 4 weeks, Model 2, %, 1992-2016**

**Table 23 — The distribution of the sample by macroregions by age cohorts and year, Model 1 (with normally retired), %, 1992-2016**

| | 35-39 | | | | | 55-59 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | North-West | North-East | Center | South | Islands | North-West | North-East | Center | South | Islands |
| 1992 | 24.1 | 21.3 | 18.3 | 26.0 | 10.3 | 25.5 | 21.4 | 19.9 | 24.1 | 9.1 |
| 1993 | 23.7 | 21.1 | 19.3 | 25.5 | 10.4 | 25.6 | 21.3 | 20.3 | 24.2 | 8.6 |
| 1994 | 23.8 | 21.9 | 19.0 | 24.9 | 10.5 | 26.2 | 21.5 | 20.1 | 24.0 | 8.2 |
| 1995 | 25.0 | 22.3 | 19.0 | 23.6 | 10.0 | 27.3 | 20.7 | 21.1 | 22.7 | 8.2 |
| 1996 | 25.4 | 22.0 | 19.3 | 23.4 | 9.9 | 27.1 | 21.8 | 21.1 | 22.0 | 8.0 |
| 1997 | 24.9 | 22.4 | 19.1 | 23.9 | 9.7 | 27.8 | 21.9 | 20.8 | 21.9 | 7.6 |
| 1998 | 24.4 | 22.3 | 19.2 | 24.3 | 9.8 | 28.2 | 22.2 | 20.6 | 20.7 | 8.2 |
| 1999 | 25.9 | 22.5 | 18.8 | 23.1 | 9.7 | 28.0 | 21.8 | 20.7 | 21.5 | 8.0 |
| 2000 | 25.6 | 22.2 | 19.3 | 23.3 | 9.6 | 27.0 | 22.0 | 20.4 | 21.8 | 8.8 |
| 2001 | 26.2 | 22.0 | 18.5 | 23.1 | 10.2 | 26.6 | 20.4 | 20.6 | 22.9 | 9.4 |
| 2002 | 26.2 | 22.6 | 18.4 | 22.5 | 10.3 | 25.9 | 21.8 | 19.7 | 23.5 | 9.0 |
| 2003 | 26.7 | 22.2 | 18.4 | 22.7 | 10.0 | 25.5 | 21.4 | 19.7 | 24.1 | 9.2 |
| 2004 | 27.8 | 23.9 | 14.9 | 23.4 | 10.1 | 27.2 | 20.9 | 17.0 | 25.4 | 9.5 |
| 2005 | 28.6 | 23.2 | 14.7 | 23.2 | 10.3 | 27.6 | 20.5 | 16.5 | 25.1 | 10.3 |
| 2006 | 27.9 | 22.9 | 15.3 | 23.4 | 10.6 | 27.4 | 21.2 | 16.2 | 24.9 | 10.3 |
| 2007 | 27.8 | 22.6 | 15.7 | 23.3 | 10.6 | 27.5 | 20.7 | 16.7 | 24.9 | 10.2 |
| 2008 | 28.1 | 22.4 | 16.1 | 22.7 | 10.6 | 27.5 | 20.4 | 16.7 | 24.9 | 10.% |
| 2009 | 28.3 | 22.2 | 17.1 | 22.0 | 10.4 | 28.0 | 20.7 | 16.8 | 23.5 | 11.0 |

| | 35-39 | | | | | 55-59 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | North-West | North-East | Center | South | Islands | North-West | North-East | Center | South | Islands |
| 2010 | 28.2 | 23.5 | 17.2 | 20.9 | 10.3 | 28.0 | 20.8 | 17.0 | 22.9 | 11.3 |
| 2011 | 28.1 | 23.1 | 16.9 | 21.2 | 10.8 | 28.1 | 20.6 | 16.6 | 23.6 | 11.1 |
| 2012 | 28.4 | 22.7 | 17.9 | 20.0 | 11.1 | 28.0 | 21.6 | 18.0 | 21.3 | 11.1 |
| 2013 | 28.5 | 22.7 | 18.6 | 19.7 | 10.5 | 27.9 | 22.2 | 18.7 | 20.1 | 11.1 |
| 2014 | 28.2 | 22.5 | 18.9 | 20.2 | 10.2 | 28.0 | 22.4 | 19.0 | 20.1 | 10.4 |
| 2015 | 28.5 | 22.6 | 18.8 | 19.6 | 10.6 | 28.8 | 22.3 | 19.4 | 19.6 | 9.9 |
| 2016 | 28.1 | 22.9 | 19.5 | 18.8 | 10.7 | 28.5 | 22.7 | 19.5 | 19.2 | 10.1 |

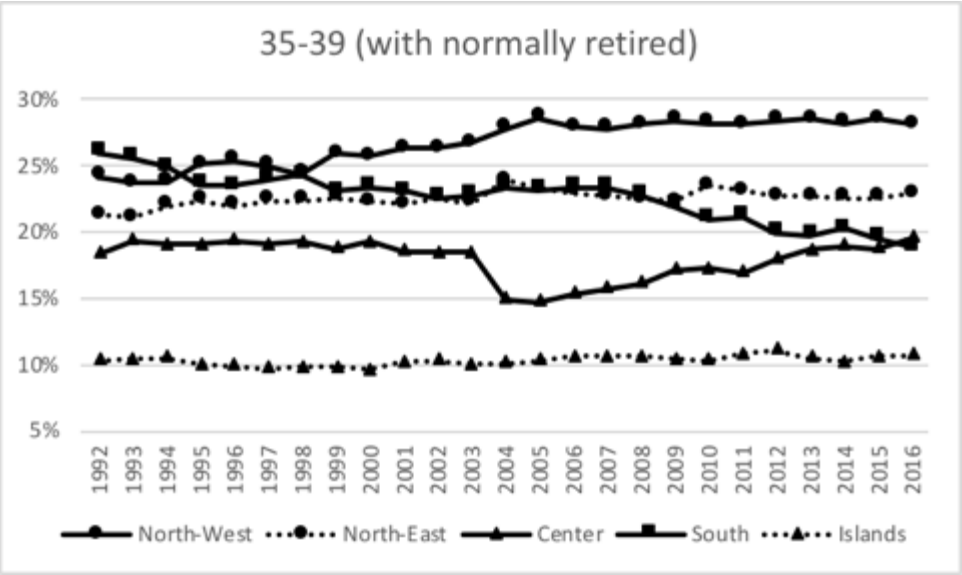


**Figure 24 — The distribution of the sample by macroregion, 35-39 age cohorts, by year, Model 1, %, 1992-2016**

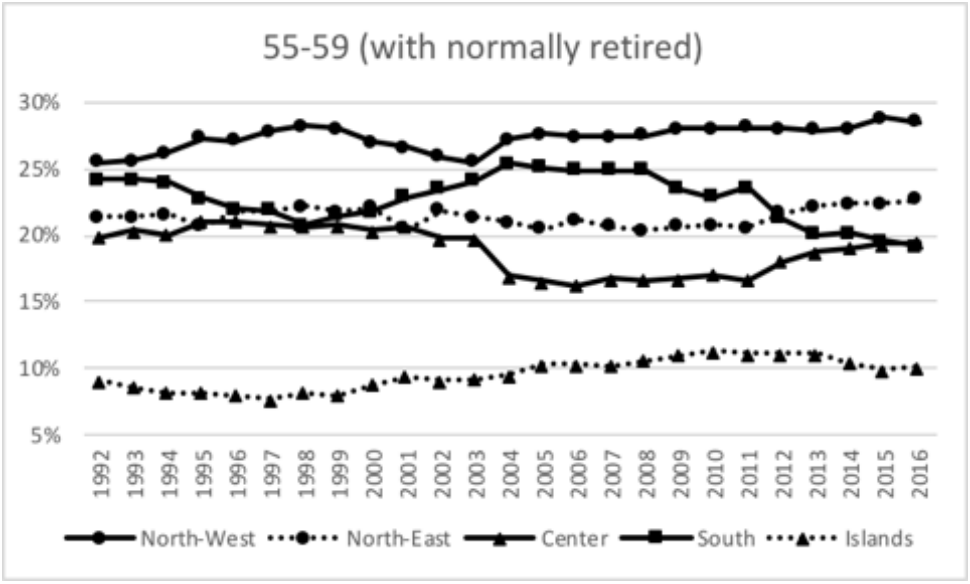


**Figure 25 — The distribution of the sample by macroregion, 55-59 age cohorts, by year, Model 1, %, 1992-2016**

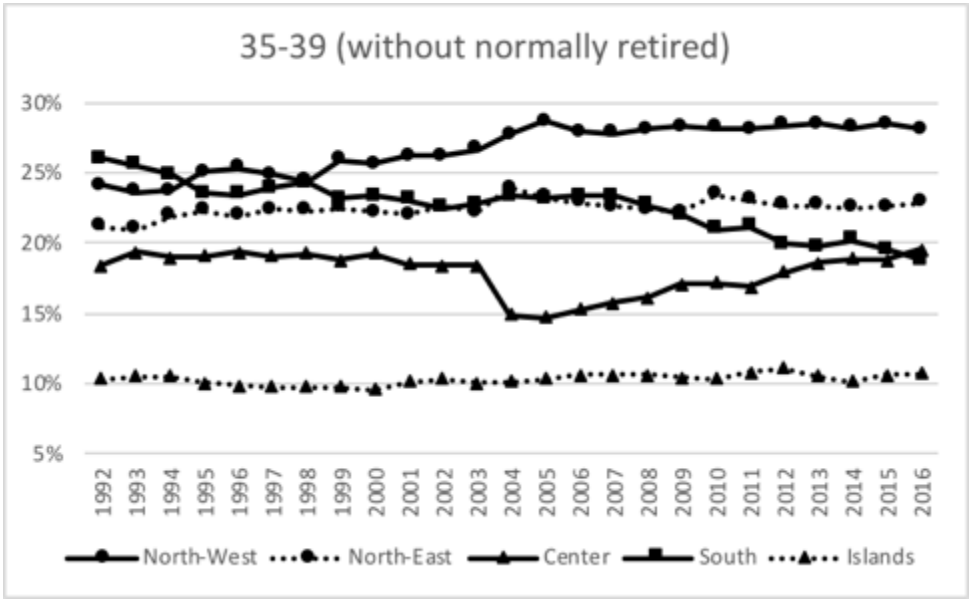


**Figure 26 — The distribution of the sample by macroregion, 35-39 age cohorts, by year, Model 2, %, 1992-2016**

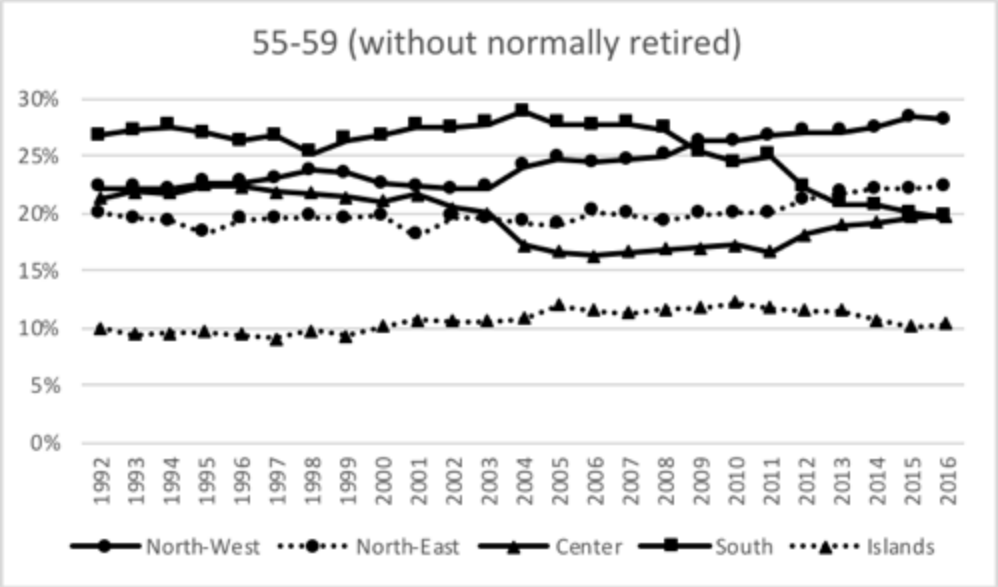


**Figure 27 — The distribution of the sample by macroregion, 55-59 age cohorts, by year, Model 2, %, 1992-2016**

**Table 24 — The distribution of the sample by macroregions by age cohorts and year, Model 2 (without normally retired), %, 1992-2016**

| | 35-39 | | | | | 55-59 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | North-West | North-East | Center | South | Islands | North-West | North-East | Center | South | Islands |
| 1992 | 24.1 | 21.2 | 18.4 | 26.1 | 10.3 | 22.2 | 19.9 | 21.2 | 26.7 | 10.0 |
| 1993 | 23.6 | 21.0 | 19.4 | 25.6 | 10.4 | 22.1 | 19.5 | 21.8 | 27.2 | 9.4 |
| 1994 | 23.8 | 21.9 | 19.0 | 24.9 | 10.5 | 22.0 | 19.3 | 21.7 | 27.5 | 9.5 |
| 1995 | 25.0 | 22.3 | 19.0 | 23.6 | 10.0 | 22.6 | 18.3 | 22.4 | 27.0 | 9.7 |
| 1996 | 25.4 | 22.0 | 19.3 | 23.5 | 9.8 | 22.7 | 19.4 | 22.3 | 26.3 | 9.4 |
| 1997 | 24.9 | 22.4 | 19.1 | 23.9 | 9.7 | 23.0 | 19.5 | 21.8 | 26.7 | 9.0 |
| 1998 | 24.4 | 22.3 | 19.2 | 24.3 | 9.8 | 23.7 | 19.7 | 21.7 | 25.2 | 9.7 |
| 1999 | 25.9 | 22.5 | 18.8 | 23.1 | 9.7 | 23.5 | 19.5 | 21.3 | 26.4 | 9.3 |
| 2000 | 25.6 | 22.2 | 19.3 | 23.3 | 9.6 | 22.5 | 19.7 | 21.0 | 26.7 | 10.1 |
| 2001 | 26.2 | 22.0 | 18.5 | 23.1 | 10.2 | 22.2 | 18.0 | 21.6 | 27.5 | 10.7 |
| 2002 | 26.2 | 22.6 | 18.4 | 22.5 | 10.3 | 22.1 | 19.7 | 20.4 | 27.4 | 10.5 |
| 2003 | 26.7 | 22.2 | 18.4 | 22.7 | 10.0 | 22.2 | 19.5 | 20.0 | 27.8 | 10.5 |
| 2004 | 27.8 | 23.9 | 14.9 | 23.4 | 10.1 | 24.0 | 19.2 | 17.2 | 28.8 | 10.8 |
| 2005 | 28.6 | 23.2 | 14.7 | 23.2 | 10.3 | 24.7 | 18.9 | 16.6 | 27.8 | 11.9 |
| 2006 | 27.9 | 22.9 | 15.3 | 23.4 | 10.6 | 24.4 | 20.1 | 16.2 | 27.7 | 11.5 |
| 2007 | 27.8 | 22.6 | 15.7 | 23.3 | 10.6 | 24.6 | 19.8 | 16.6 | 27.8 | 11.2 |
| 2008 | 28.1 | 22.4 | 16.1 | 22.7 | 10.6 | 24.9 | 19.3 | 16.8 | 27.3 | 11.7 |
| 2009 | 28.3 | 22.2 | 17.1 | 22.0 | 10.4 | 26.2 | 19.8 | 16.9 | 25.3 | 11.8 |
| 2010 | 28.2 | 23.5 | 17.2 | 20.9 | 10.3 | 26.2 | 20.0 | 17.2 | 24.4 | 12.2 |

| | 35-39 | | | | | 55-59 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | North-West | North-East | Center | South | Islands | North-West | North-East | Center | South | Islands |
| 2011 | 28.1 | 23.1 | 16.9 | 21.2 | 10.8 | 26.7 | 19.9 | 16.7 | 25.0 | 11.8 |
| 2012 | 28.4 | 22.7 | 17.9 | 20.0 | 11.1 | 27.0 | 21.2 | 18.1 | 22.1 | 11.5 |
| 2013 | 28.5 | 22.7 | 18.6 | 19.7 | 10.5 | 27.1 | 21.7 | 18.9 | 20.8 | 11.5 |
| 2014 | 28.2 | 22.5 | 18.9 | 20.2 | 10.2 | 27.4 | 22.0 | 19.2 | 20.6 | 10.7 |
| 2015 | 28.5 | 22.6 | 18.8 | 19.6 | 10.6 | 28.3 | 22.1 | 19.6 | 19.9 | 10.1 |
| 2016 | 28.1 | 22.9 | 19.5 | 18.8 | 10.7 | 28.1 | 22.3 | 19.8 | 19.6 | 10.3 |

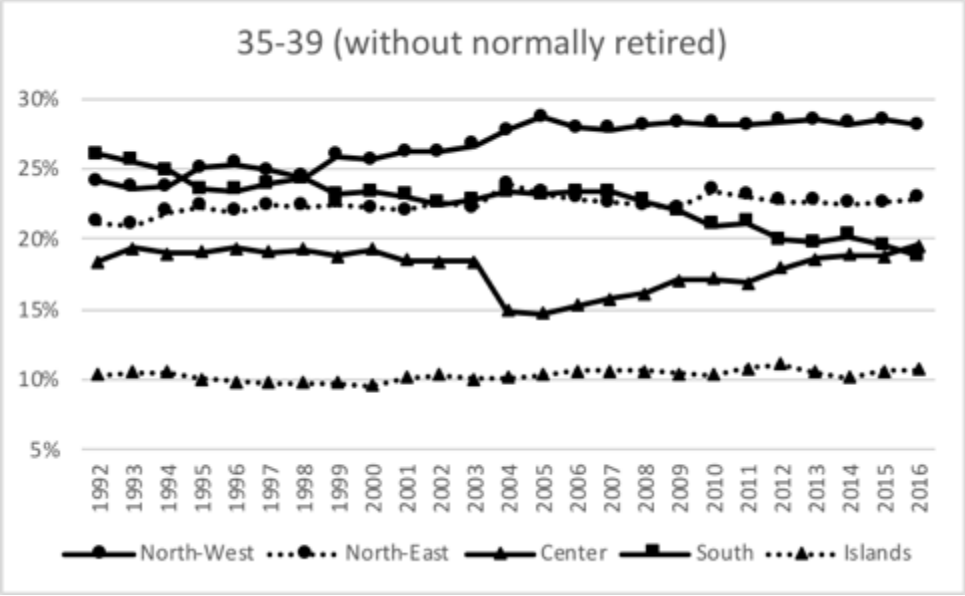


**Figure 26 — The distribution of the sample by macroregion, 35-39 age cohorts, by year, Model 2, %, 1992-2016**

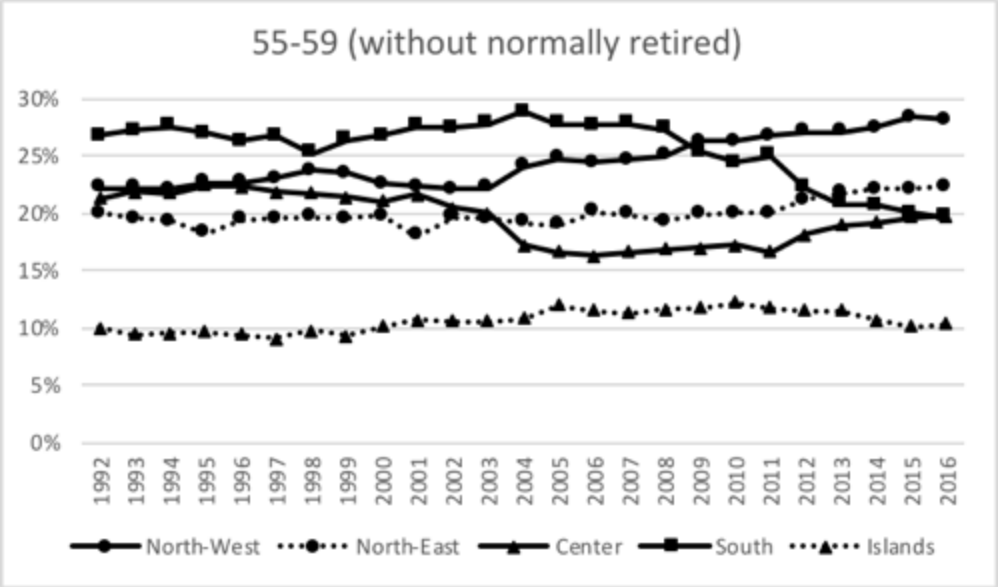


**Figure 27 — The distribution of the sample by macroregion, 55-59 age cohorts, by year, Model 2, %, 1992-2016**

**Table 25 — The distribution of the sample by professions, current or last job, ISCO codes (1 digit), 35-39 years old cohort, by years, %, Model 1, 1992-2016**

| | 35-39 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 1992 | 2.2 | 13.0 | 14.8 | 14.4 | 14.7 | 3.6 | 18.9 | 8.3 | 10.2 |
| 1993 | 2.2 | 12.4 | 14.9 | 15.4 | 14.1 | 3.7 | 19.0 | 8.1 | 10.3 |
| 1994 | 2.2 | 12.1 | 14.8 | 14.9 | 15.2 | 3.5 | 18.5 | 8.6 | 10.1 |
| 1995 | 2.5 | 12.0 | 15.8 | 14.9 | 15.3 | 3.4 | 17.6 | 8.5 | 10.0 |
| 1996 | 2.3 | 11.6 | 15.7 | 15.3 | 15.4 | 3.4 | 17.4 | 8.5 | 10.3 |
| 1997 | 2.3 | 11.6 | 15.5 | 15.5 | 15.7 | 3.4 | 17.6 | 7.9 | 10.4 |
| 1998 | 2.7 | 11.7 | 15.0 | 14.9 | 16.2 | 3.6 | 18.0 | 8.2 | 9.8 |
| 1999 | 2.6 | 11.2 | 15.7 | 14.0 | 16.7 | 3.0 | 17.6 | 9.0 | 10.3 |
| 2000 | 4.0 | 10.4 | 16.4 | 13.9 | 16.9 | 3.0 | 16.1 | 8.8 | 10.5 |
| 2001 | 2.7 | 10.4 | 17.4 | 12.9 | 17.3 | 3.0 | 17.2 | 8.6 | 10.5 |
| 2002 | 2.9 | 10.3 | 18.2 | 13.6 | 16.6 | 2.9 | 16.7 | 9.1 | 9.8 |
| 2003 | 2.9 | 10.3 | 18.3 | 12.9 | 17.5 | 2.7 | 15.8 | 9.7 | 9.9 |
| 2004 | 8.7 | 8.8 | 20.2 | 11.3 | 11.0 | 2.6 | 16.3 | 10.3 | 10.9 |
| 2005 | 8.2 | 8.7 | 19.7 | 11.9 | 11.3 | 2.1 | 16.7 | 10.2 | 11.2 |
| 2006 | 7.6 | 8.3 | 21.5 | 10.9 | 12.7 | 2.1 | 16.6 | 9.8 | 10.6 |
| 2007 | 7.2 | 8.8 | 22.0 | 10.4 | 13.1 | 1.9 | 16.6 | 9.6 | 10.4 |

| | 35-39 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 2008 | 7.1 | 9.3 | 21.4 | 10.7 | 12.5 | 2.1 | 16.8 | 9.3 | 11.0 |
| 2009 | 7.3 | 9.1 | 20.6 | 11.4 | 12.6 | 2.1 | 17.3 | 8.9 | 10.8 |
| 2010 | 6.8 | 8.9 | 19.5 | 11.8 | 13.2 | 1.9 | 17.2 | 9.0 | 11.6 |
| 2011 | 10.8 | 11.5 | 15.8 | 12.2 | 9.9 | 2.1 | 16.8 | 9.0 | 11.7 |
| 2012 | 10.6 | 11.8 | 15.4 | 12.3 | 10.6 | 2.0 | 16.0 | 9.1 | 12.1 |
| 2013 | 11.0 | 12.1 | 15.3 | 12.9 | 10.7 | 1.8 | 15.7 | 8.7 | 12.0 |
| 2014 | 11.1 | 12.3 | 15.4 | 13.0 | 10.9 | 1.9 | 14.7 | 8.9 | 11.8 |
| 2015 | 10.7 | 13.1 | 15.1 | 12.7 | 11.2 | 1.8 | 14.3 | 8.7 | 12.4 |
| 2016 | 10.9 | 13.5 | 14.6 | 12.4 | 11.4 | 1.9 | 14.4 | 8.0 | 13.0 |

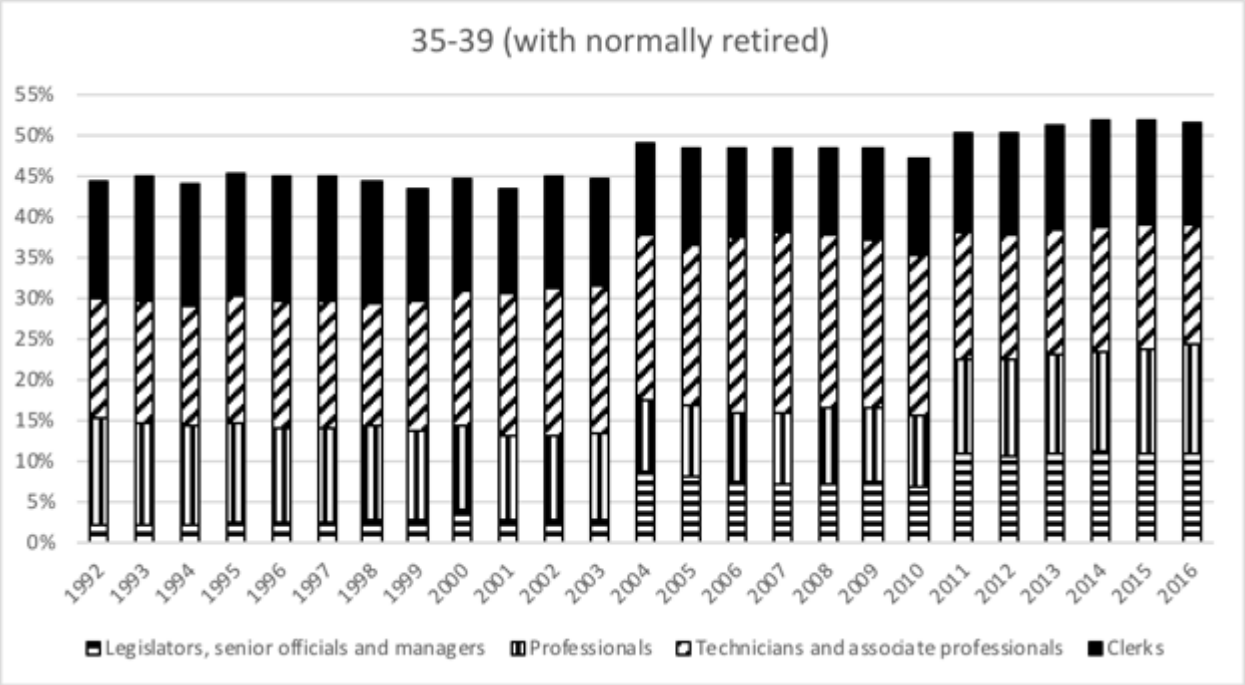


**Figure 28 — The distribution of the sample by professions (non-manual jobs), age cohort 35-39 years old, Model 1**

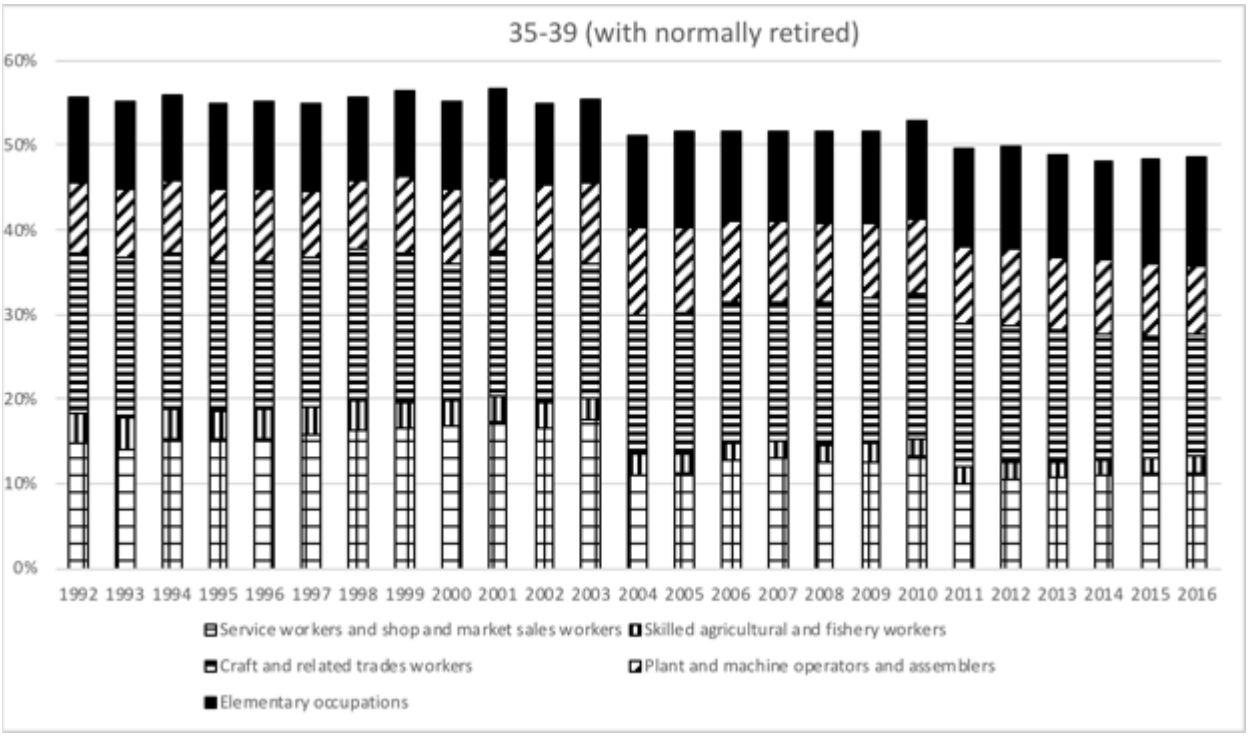


**Figure 29 — The distribution of the sample by professions (manual jobs), age cohort 35-39 years old, Model 1**

**Table 26 — The distribution of the sample by professions, current or last job, ISCO codes (1 digit), absolute numbers, 55-59 years old cohort, by years, Model 1, %, 1992-2016**

| | 55-59 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 1992 | 3.0 | 6.2 | 7.4 | 8.3 | 15.1 | 11.1 | 20.3 | 10.9 | 17.7 |
| 1993 | 3.3 | 5.9 | 7.9 | 7.5 | 14.8 | 10.9 | 21.8 | 11.5 | 16.4 |
| 1994 | 3.5 | 6.6 | 8.7 | 8.3 | 14.7 | 9.9 | 20.8 | 11.8 | 15.8 |
| 1995 | 3.9 | 7.2 | 9.5 | 8.5 | 14.5 | 8.8 | 20.3 | 11.3 | 15.9 |
| 1996 | 4.2 | 8.0 | 9.3 | 9.0 | 14.5 | 8.0 | 19.8 | 11.6 | 15.6 |
| 1997 | 4.0 | 8.2 | 10.3 | 9.6 | 14.0 | 7.3 | 20.3 | 11.2 | 15.0 |
| 1998 | 4.7 | 9.2 | 10.4 | 10.4 | 14.2 | 6.1 | 20.2 | 12.0 | 12.8 |
| 1999 | 5.1 | 10.2 | 11.0 | 10.1 | 14.1 | 5.8 | 20.3 | 11.7 | 11.8 |
| 2000 | 5.5 | 9.5 | 12.5 | 10.1 | 14.3 | 5.6 | 19.3 | 11.3 | 11.9 |
| 2001 | 4.8 | 10.1 | 12.9 | 9.9 | 14.0 | 5.3 | 18.5 | 11.5 | 13.1 |
| 2002 | 5.1 | 11.2 | 13.7 | 10.5 | 13.6 | 5.3 | 18.0 | 10.2 | 12.5 |
| 2003 | 5.4 | 10.9 | 13.6 | 10.7 | 13.5 | 4.6 | 18.6 | 10.5 | 12.0 |
| 2004 | 11.3 | 10.1 | 15.4 | 10.4 | 7.2 | 4.6 | 17.7 | 9.9 | 13.3 |

| | 55-59 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 2005 | 11.2 | 10.9 | 15.6 | 10.6 | 6.7 | 4.3 | 17.5 | 10.4 | 12.5 |
| 2006 | 10.9 | 11.1 | 17.8 | 10.2 | 7.1 | 3.7 | 16.9 | 10.1 | 12.2 |
| 2007 | 10.5 | 11.4 | 18.9 | 9.5 | 7.3 | 3.4 | 16.8 | 10.0 | 12.3 |
| 2008 | 9.7 | 11.4 | 18.9 | 10.5 | 7.5 | 3.7 | 16.6 | 9.4 | 12.3 |
| 2009 | 9.2 | 11.7 | 18.2 | 11.7 | 7.4 | 3.9 | 16.5 | 9.1 | 12.3 |
| 2010 | 8.9 | 11.8 | 17.7 | 12.5 | 7.5 | 3.6 | 15.8 | 8.6 | 13.5 |
| 2011 | 9.5 | 15.6 | 13.8 | 12.9 | 7.5 | 3.6 | 15.2 | 8.7 | 13.3 |
| 2012 | 9.4 | 14.6 | 13.4 | 13.3 | 8.3 | 3.6 | 15.2 | 8.5 | 13.8 |
| 2013 | 9.6 | 14.7 | 13.5 | 13.5 | 8.9 | 3.4 | 14.3 | 8.6 | 13.5 |
| 2014 | 10.1 | 14.2 | 14.2 | 13.9 | 8.8 | 3.2 | 14.0 | 8.3 | 13.2 |
| 2015 | 9.7 | 13.8 | 14.4 | 14.1 | 9.7 | 3.0 | 13.7 | 8.3 | 13.3 |
| 2016 | 9.5 | 13.8 | 14.6 | 14.2 | 10.4 | 3.0 | 13.0 | 8.1 | 13.4 |

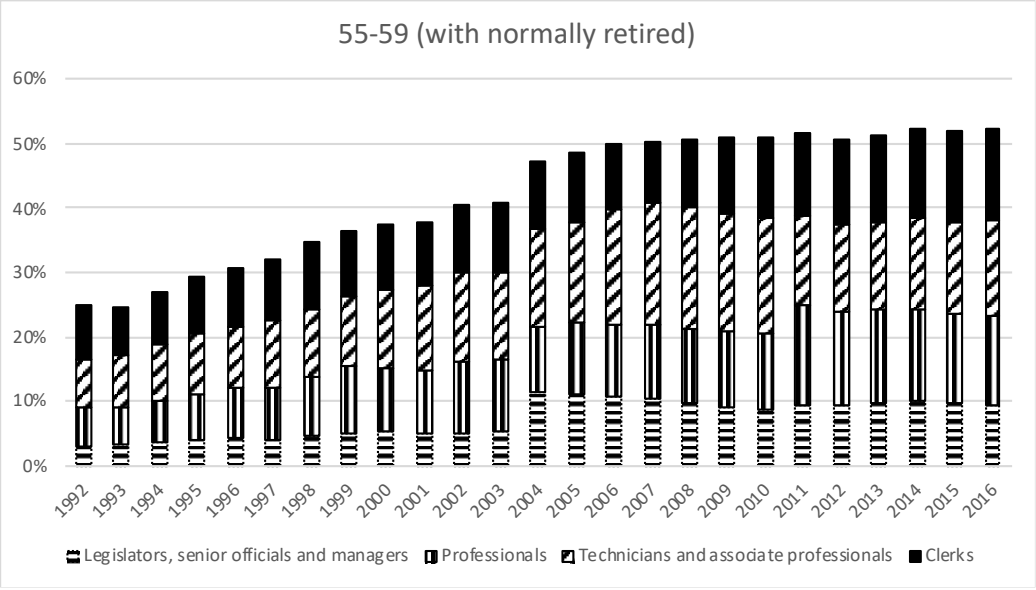


**Figure 30 — The distribution of the sample by professions (non-manual jobs), age cohort 55-59 years old, Model 1**

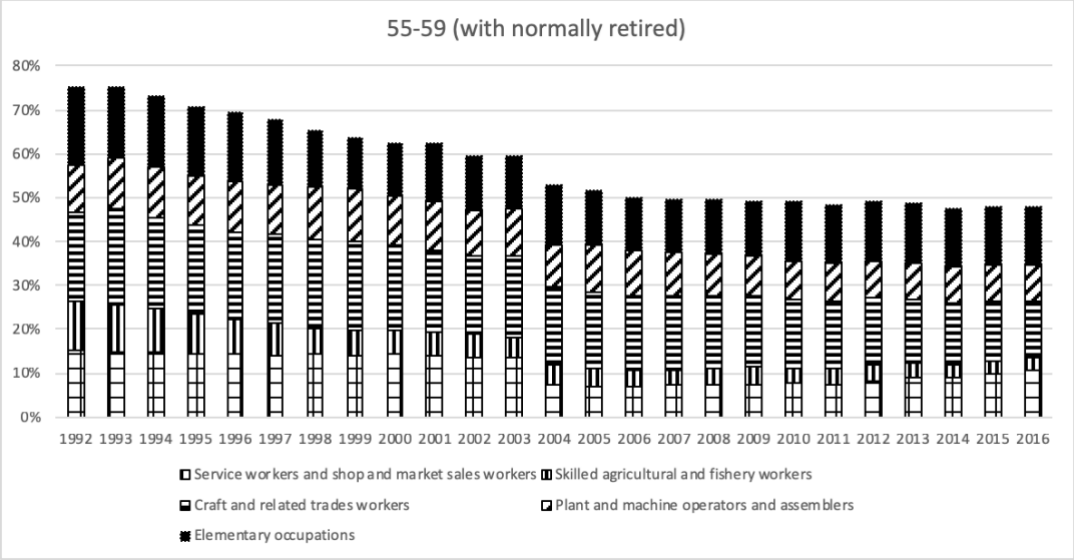


**Figure 31 — The distribution of the sample by professions (manual jobs), age cohort 55-59 years old, Model 1**

**Table 27 — The distribution of the sample by professions, current or last job, ISCO codes (1 digit), 35-39 years old cohort, by years, Model 2, %, 1992-2016**

| | 35-39 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 1992 | 2.2 | 13.0 | 14.7 | 14.4 | 14.7 | 3.6 | 18.9 | 8.3 | 10.2 |
| 1993 | 2.2 | 12.4 | 14.9 | 15.4 | 14.1 | 3.8 | 19.0 | 8.1 | 10.3 |
| 1994 | 2.2 | 12.1 | 14.8 | 14.9 | 15.2 | 3.5 | 18.5 | 8.6 | 10.1 |
| 1995 | 2.5 | 12.0 | 15.8 | 14.9 | 15.3 | 3.4 | 17.7 | 8.5 | 10.0 |
| 1996 | 2.3 | 11.6 | 15.7 | 15.3 | 15.4 | 3.4 | 17.5 | 8.5 | 10.3 |
| 1997 | 2.3 | 11.6 | 15.5 | 15.5 | 15.7 | 3.4 | 17.6 | 7.9 | 10.4 |
| 1998 | 2.7 | 11.8 | 15.0 | 14.9 | 16.2 | 3.6 | 18.0 | 8.2 | 9.8 |
| 1999 | 2.6 | 11.2 | 15.7 | 14.0 | 16.7 | 3.0 | 17.6 | 9.0 | 10.3 |
| 2000 | 4.0 | 10.4 | 16.4 | 13.9 | 16.9 | 3.0 | 16.1 | 8.8 | 10.5 |
| 2001 | 2.7 | 10.4 | 17.4 | 12.9 | 17.3 | 3.0 | 17.2 | 8.6 | 10.5 |
| 2002 | 2.9 | 10.3 | 18.2 | 13.6 | 16.6 | 2.9 | 16.7 | 9.1 | 9.8 |
| 2003 | 2.9 | 10.4 | 18.3 | 12.9 | 17.5 | 2.7 | 15.8 | 9.7 | 9.9 |
| 2004 | 8.7 | 8.8 | 20.2 | 11.3 | 11.0 | 2.6 | 16.3 | 10.3 | 10.9 |
| 2005 | 8.2 | 8.7 | 19.7 | 11.9 | 11.3 | 2.1 | 16.7 | 10.2 | 11.2 |
| 2006 | 7.6 | 8.3 | 21.5 | 10.9 | 12.7 | 2.1 | 16.6 | 9.8 | 10.5 |
| 2007 | 7.2 | 8.8 | 22.0 | 10.4 | 13.1 | 1.9 | 16.6 | 9.6 | 10.4 |

| | 35-39 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 2008 | 7.1 | 9.3 | 21.4 | 10.7 | 12.5 | 2.1 | 16.8 | 9.3 | 11.0 |
| 2009 | 7.3 | 9.1 | 20.6 | 11.4 | 12.6 | 2.1 | 17.3 | 8.9 | 10.8 |
| 2010 | 6.8 | 8.9 | 19.5 | 11.8 | 13.2 | 1.9 | 17.2 | 9.0 | 11.6 |
| 2011 | 10.8 | 11.5 | 15.8 | 12.2 | 9.9 | 2.1 | 16.8 | 9.0 | 11.7 |
| 2012 | 10.6 | 11.8 | 15.4 | 12.3 | 10.6 | 2.0 | 16.0 | 9.1 | 12.1 |
| 2013 | 11.0 | 12.1 | 15.3 | 12.9 | 10.7 | 1.8 | 15.7 | 8.7 | 12.0 |
| 2014 | 11.1 | 12.3 | 15.4 | 13.0 | 10.9 | 1.9 | 14.7 | 8.9 | 11.8 |
| 2015 | 10.7 | 13.1 | 15.1 | 12.7 | 11.2 | 1.8 | 14.3 | 8.7 | 12.4 |
| 2016 | 10.9 | 13.5 | 14.6 | 12.4 | 11.4 | 1.9 | 14.4 | 8.0 | 13.0 |

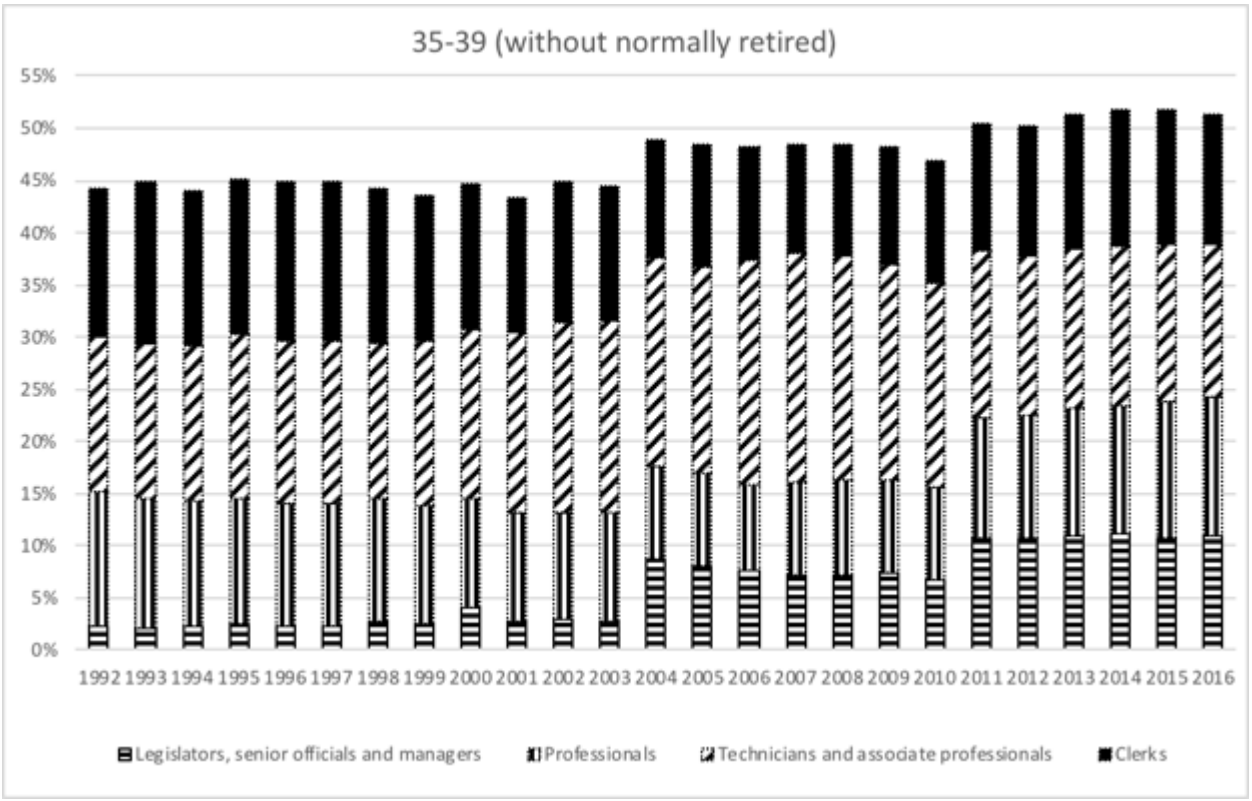


**Figure 32 — The distribution of the sample by professions (non-manual jobs), age cohort 35-39 years old, Model 2**

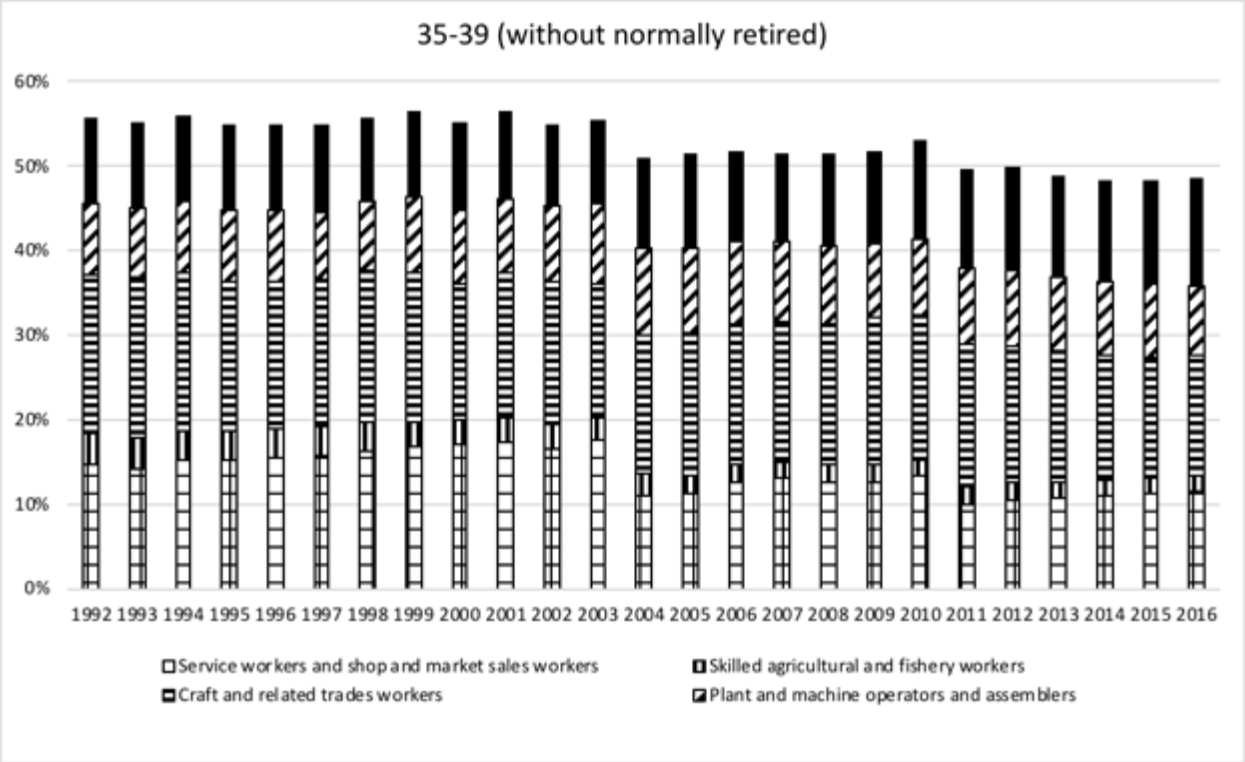


**Figure 33 — The distribution of the sample by professions (manual jobs), age cohort 35-39 years old, Model 2**

**Table 28 — The distribution of the sample by professions, current or last job, ISCO codes (1 digit), absolute numbers, 55-59 years old cohort, by years, Model 2, %, 1992-2016**

| | 55-59 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 1992 | 3.4 | 6.6 | 7.7 | 7.8 | 16.5 | 12.3 | 20.1 | 9.5 | 16.1 |
| 1993 | 3.8 | 6.4 | 8.3 | 7.4 | 16.0 | 12.1 | 20.9 | 10.0 | 14.9 |
| 1994 | 4.2 | 7.4 | 9.1 | 7.1 | 16.4 | 11.1 | 20.5 | 10.2 | 14.0 |
| 1995 | 4.8 | 7.9 | 9.9 | 8.0 | 16.4 | 9.8 | 19.3 | 9.2 | 14.7 |
| 1996 | 5.1 | 8.9 | 9.6 | 8.3 | 16.6 | 8.8 | 18.9 | 9.0 | 14.9 |
| 1997 | 4.8 | 9.2 | 11.0 | 8.8 | 16.2 | 8.4 | 18.7 | 8.3 | 14.6 |
| 1998 | 5.7 | 10.1 | 11.0 | 9.8 | 16.4 | 7.1 | 18.1 | 8.6 | 13.2 |
| 1999 | 6.1 | 11.1 | 11.2 | 8.7 | 16.4 | 6.7 | 18.4 | 8.4 | 12.9 |
| 2000 | 6.0 | 10.4 | 12.6 | 9.3 | 16.3 | 6.4 | 17.3 | 8.5 | 13.2 |
| 2001 | 5.3 | 11.2 | 12.7 | 8.9 | 16.1 | 6.1 | 17.3 | 8.5 | 13.8 |
| 2002 | 5.5 | 12.1 | 13.7 | 9.1 | 15.8 | 6.0 | 16.9 | 7.3 | 13.5 |

| | 55-59 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Year | Legislators, senior officials and managers | Professionals | Technicians and associate professionals | Clerks | Service workers and shop and market sales workers | Skilled agricultural and fishery workers | Craft and related trades workers | Plant and machine operators and assemblers | Elementary occupations |
| 2003 | 5.8 | 12.3 | 13.9 | 10.2 | 15.1 | 5.3 | 17.2 | 7.5 | 12.7 |
| 2004 | 13.8 | 11.6 | 16.4 | 8.4 | 8.0 | 5.0 | 15.6 | 6.8 | 14.4 |
| 2005 | 13.4 | 12.7 | 16.6 | 9.2 | 7.3 | 4.6 | 15.3 | 7.3 | 13.5 |
| 2006 | 12.8 | 12.9 | 18.3 | 9.3 | 7.5 | 4.0 | 15.1 | 6.9 | 13.3 |
| 2007 | 12.2 | 13.0 | 19.2 | 8.7 | 7.7 | 3.6 | 15.2 | 7.2 | 13.2 |
| 2008 | 11.0 | 12.5 | 19.2 | 10.0 | 7.6 | 3.9 | 15.3 | 7.3 | 13.0 |
| 2009 | 10.1 | 12.6 | 18.5 | 11.1 | 7.4 | 4.0 | 15.5 | 7.6 | 13.1 |
| 2010 | 9.7 | 12.6 | 18.2 | 12.1 | 7.5 | 3.7 | 14.7 | 7.2 | 14.3 |
| 2011 | 9.8 | 16.6 | 14.1 | 12.7 | 7.6 | 3.7 | 14.1 | 7.5 | 14.0 |
| 2012 | 9.7 | 15.3 | 13.6 | 13.2 | 8.3 | 3.6 | 14.4 | 7.7 | 14.2 |
| 2013 | 9.8 | 15.4 | 13.7 | 13.5 | 8.8 | 3.4 | 13.5 | 8.1 | 13.8 |
| 2014 | 10.3 | 14.8 | 14.3 | 13.8 | 8.7 | 3.3 | 13.5 | 7.9 | 13.4 |
| 2015 | 9.8 | 14.2 | 14.5 | 13.9 | 9.6 | 3.1 | 13.5 | 7.9 | 13.4 |
| 2016 | 9.6 | 14.1 | 14.7 | 14.1 | 10.2 | 3.1 | 12.8 | 7.8 | 13.6 |

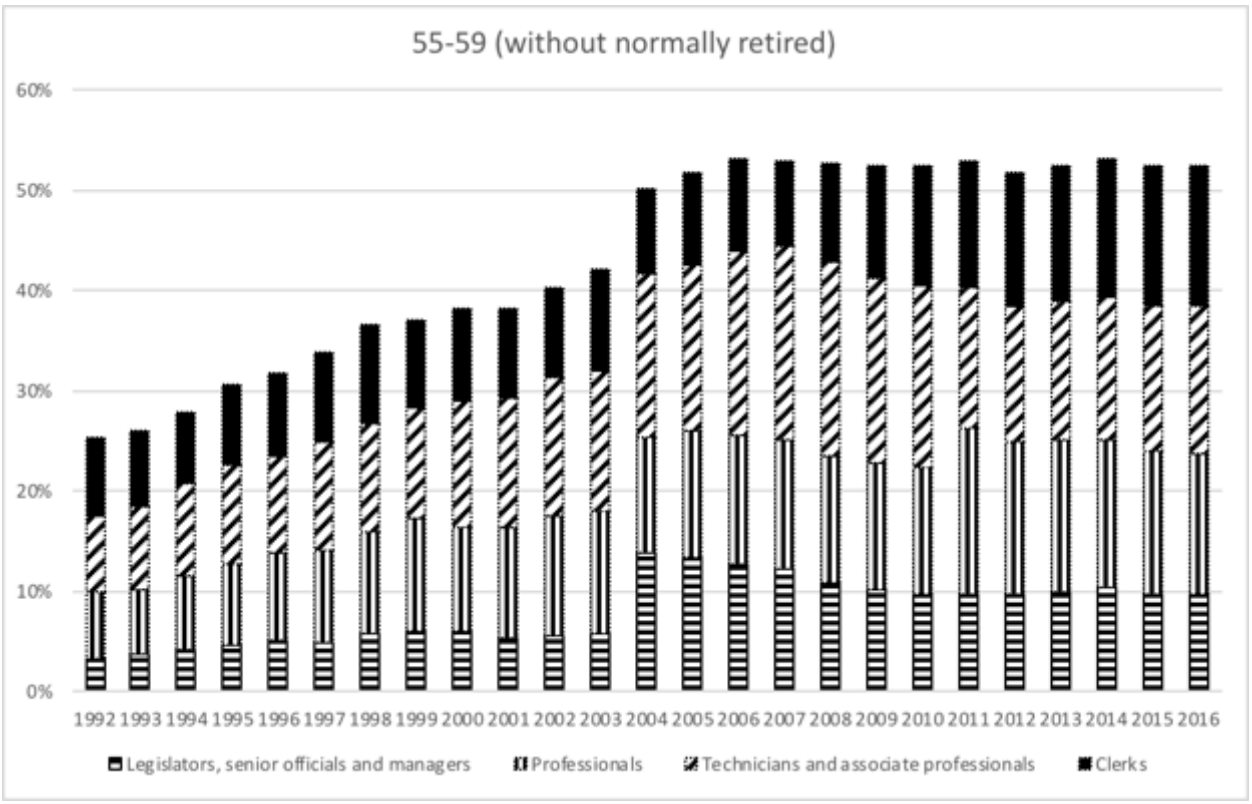


**Figure 34 — The distribution of the sample by professions (non-manual jobs), age cohort 55-59 years old, Model 2**

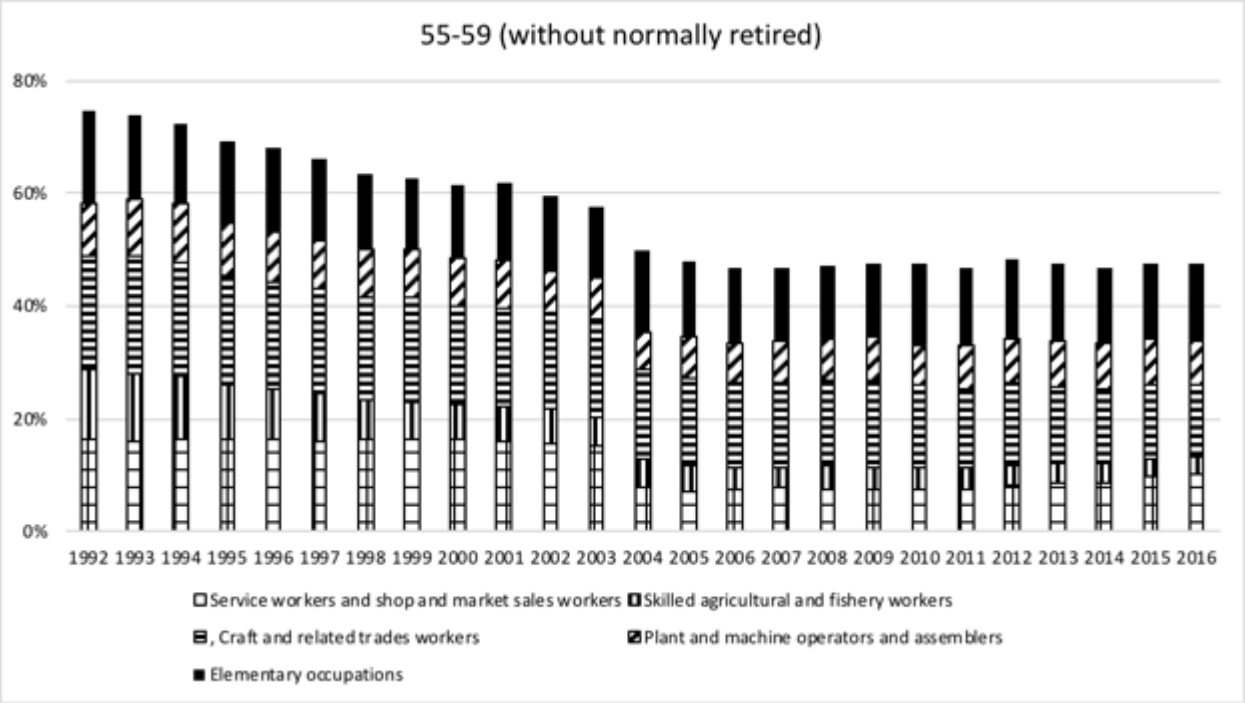


**Figure 35 — The distribution of the sample by professions (manual jobs), age cohort 55-59 years old, Model 2**

**Table 29 — The distribution of the sample by sectors of current or last job, by age cohorts and time, Model 1, %, 1992-2016**

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Agriculture | Industry | Services | Agriculture | Industry | Services |
| 1992 | 6.7 | 30.7 | 62.6 | 17.3 | 33.5 | 49.2 |
| 1993 | 6.4 | 30.1 | 63.5 | 16.4 | 35.1 | 48.5 |
| 1994 | 6.5 | 30.0 | 63.4 | 15.6 | 33.9 | 50.4 |
| 1995 | 6.6 | 29.9 | 63.6 | 14.0 | 34.7 | 51.3 |
| 1996 | 6.6 | 30.0 | 63.5 | 13.0 | 34.3 | 52.7 |
| 1997 | 6.1 | 29.5 | 64.5 | 12.0 | 34.0 | 54.0 |
| 1998 | 6.4 | 30.1 | 63.5 | 10.1 | 34.0 | 55.9 |
| 1999 | 6.1 | 30.2 | 63.7 | 8.8 | 34.5 | 56.7 |
| 2000 | 6.0 | 29.4 | 64.6 | 8.4 | 32.9 | 58.7 |
| 2001 | 6.0 | 30.1 | 64.0 | 9.0 | 32.7 | 58.3 |
| 2002 | 5.5 | 30.6 | 63.9 | 9.0 | 32.1 | 58.8 |
| 2003 | 5.6 | 31.5 | 62.9 | 8.2 | 32.6 | 59.2 |
| 2004 | 5.4 | 32.3 | 62.3 | 9.0 | 32.2 | 58.8 |
| 2005 | 5.1 | 32.4 | 62.5 | 8.5 | 31.6 | 59.9 |
| 2006 | 5.1 | 31.2 | 63.7 | 8.0 | 30.4 | 61.6 |
| 2007 | 4.9 | 31.1 | 64.0 | 7.8 | 29.8 | 62.4 |
| 2008 | 4.7 | 31.7 | 63.6 | 7.3 | 28.9 | 63.8 |

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Agriculture | Industry | Services | Agriculture | Industry | Services |
| 2009 | 4.3 | 31.9 | 63.8 | 7.0 | 28.8 | 64.1 |
| 2010 | 4.4 | 31.6 | 64.1 | 6.8 | 27.9 | 65.3 |
| 2011 | 4.4 | 31.2 | 64.4 | 6.9 | 26.5 | 66.7 |
| 2012 | 4.1 | 30.4 | 65.5 | 6.4 | 26.3 | 67.3 |
| 2013 | 3.7 | 30.1 | 66.2 | 5.6 | 26.0 | 68.3 |
| 2014 | 3.8 | 29.5 | 66.7 | 5.7 | 25.7 | 68.6 |
| 2015 | 3.7 | 28.4 | 67.9 | 5.4 | 25.7 | 68.8 |
| 2016 | 4.0 | 28.3 | 67.8 | 5.5 | 25.1 | 69.4 |

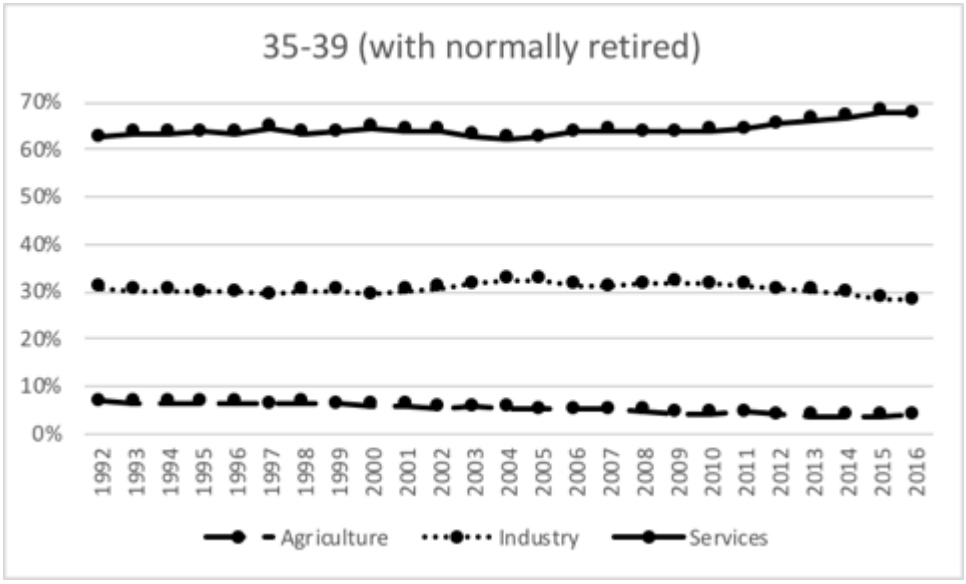


**Figure 36 — The distribution of the sample by sectors of the current or last job, 35-39 age cohort by year, Model 1, %**

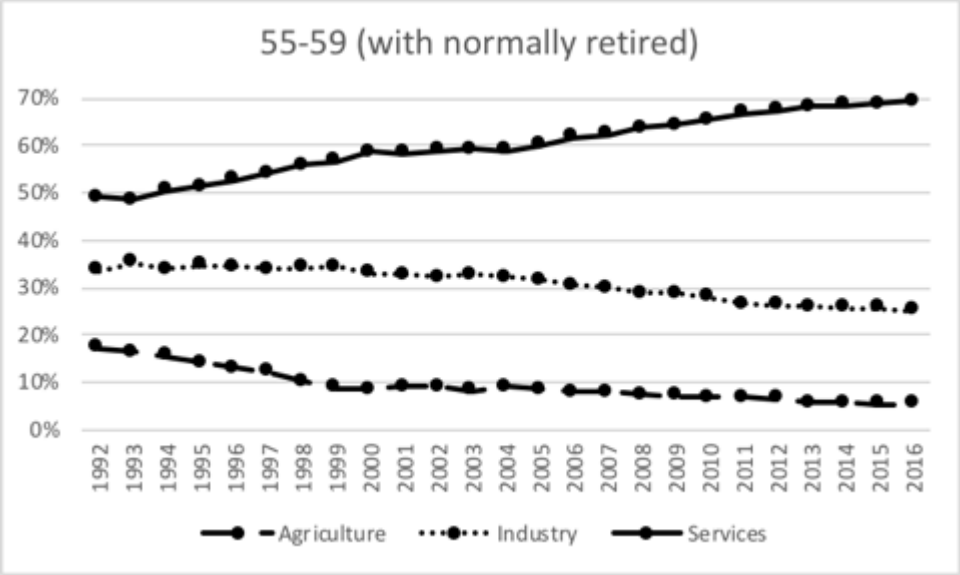


**Figure 37 — The distribution of the sample by sectors of the current or last job, 55-59 age cohort by year, Model 1, %**

**Table 30 — The distribution of the sample by sectors of current or last job, 35-39 cohorts and time, Model 2, %, 1992-2016**

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Agriculture | Industry | Services | Agriculture | Industry | Services |
| 1992 | 6.8 | 30.7 | 62.5 | 17.5 | 31.8 | 50.7 |
| 1993 | 6.5 | 30.1 | 63.4 | 16.7 | 32.4 | 51.0 |
| 1994 | 6.5 | 30.1 | 63.4 | 15.5 | 31.2 | 53.2 |
| 1995 | 6.6 | 29.9 | 63.6 | 14.4 | 31.3 | 54.3 |
| 1996 | 6.6 | 30.0 | 63.4 | 13.6 | 30.5 | 56.0 |
| 1997 | 6.1 | 29.5 | 64.5 | 13.0 | 28.6 | 58.4 |
| 1998 | 6.4 | 30.1 | 63.5 | 11.3 | 28.8 | 59.9 |
| 1999 | 6.1 | 30.2 | 63.7 | 10.2 | 29.5 | 60.3 |
| 2000 | 6.0 | 29.4 | 64.6 | 9.8 | 28.1 | 62.0 |
| 2001 | 6.0 | 30.1 | 64.0 | 10.4 | 28.6 | 61.1 |
| 2002 | 5.5 | 30.6 | 63.9 | 10.1 | 27.9 | 62.0 |
| 2003 | 5.6 | 31.5 | 62.9 | 9.1 | 28.3 | 62.6 |
| 2004 | 5.4 | 32.3 | 62.3 | 10.2 | 26.3 | 63.5 |
| 2005 | 5.1 | 32.4 | 62.5 | 9.2 | 26.0 | 64.8 |
| 2006 | 5.1 | 31.2 | 63.7 | 8.7 | 24.9 | 66.4 |
| 2007 | 4.9 | 31.1 | 64.0 | 8.3 | 25.0 | 66.7 |
| 2008 | 4.7 | 31.7 | 63.6 | 7.8 | 25.5 | 66.7 |
| 2009 | 4.3 | 31.9 | 63.8 | 7.3 | 26.3 | 66.3 |
| 2010 | 4.4 | 31.6 | 64.1 | 7.1 | 25.6 | 67.3 |
| 2011 | 4.4 | 31.2 | 64.4 | 7.1 | 24.4 | 68.5 |

| | 35-39 | | | 55-59 | | |
|---|---|---|---|---|---|---|
| Year | Agriculture | Industry | Services | Agriculture | Industry | Services |
| 2012 | 4.1 | 30.4 | 65.5 | 6.5 | 24.9 | 68.6 |
| 2013 | 3.7 | 30.1 | 66.2 | 5.7 | 24.8 | 69.5 |
| 2014 | 3.8 | 29.5 | 66.7 | 5.8 | 24.8 | 69.4 |
| 2015 | 3.7 | 28.4 | 67.9 | 5.5 | 25.2 | 69.3 |
| 2016 | 4.0 | 28.3 | 67.8 | 5.6 | 24.6 | 69.9 |

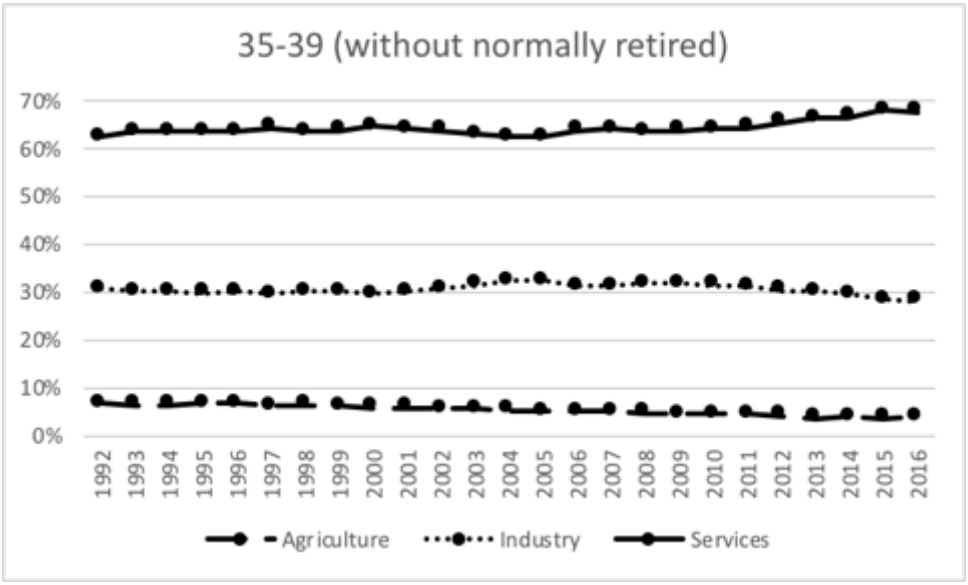


**Figure 38 — The distribution of the sample by sectors of the current or last job, 35-39 age cohort by year, Model 2, %**

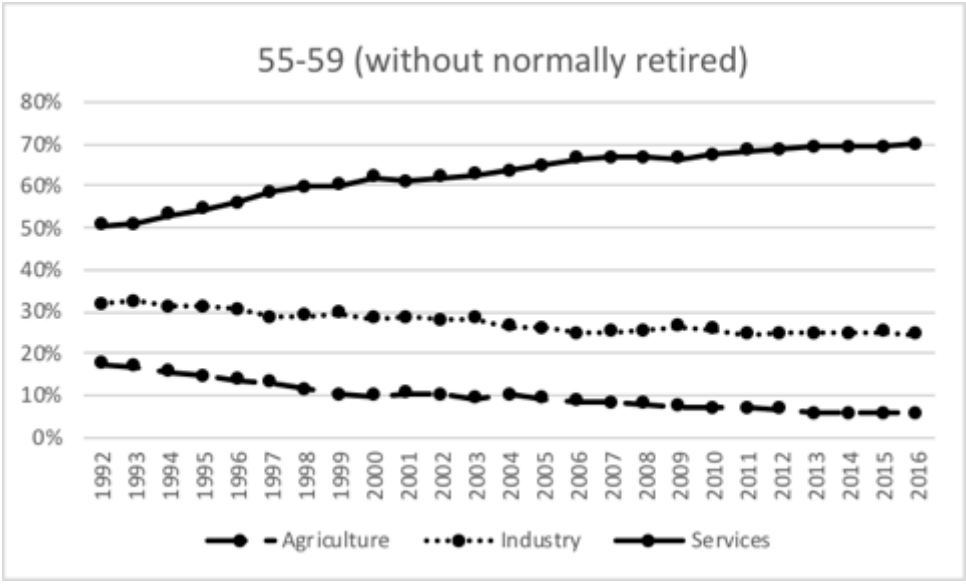


**Figure 39 — The distribution of the sample by sectors of the current or last job, 55-59 age cohort by year, Model 2, %**

# Appendix 3 — Chapter 2. Parallel trend analysis

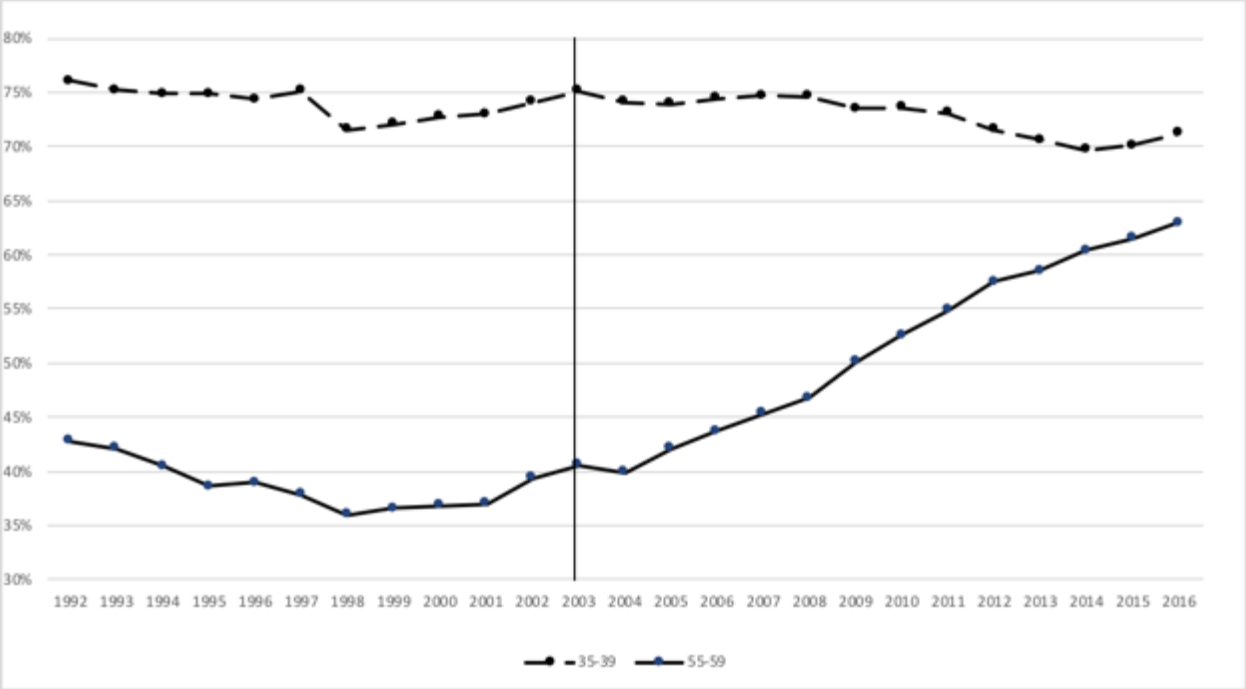


**Figure 40 — Employment rates of the treatment (55-59 years old) and control (35-39 years old) groups, %, Model 1 (with normally retired; before removal of missing variables)**

**Table 31 — Logistic regression, analysis of the parallel trend, Model 1**

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| Gender (base = female) | | |
| Male | 0.77 | 1% |
| | | |
| Level of education (base = elementary) | | |
| upper sec | 0.40 | 1% |
| tertiary | 0.76 | 1% |
| | | |
| Additional education or training in the las 4 weeks (base = no education or training) | 0.27 | 1% |
| | | |
| Macroregion (North-West) | | |
| North-East | 0.10 | 1% |
| Center | 0.12 | 1% |
| South | -0.10 | 1% |
| Islands | -0.20 | 1% |

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| | | |
| ISCO (base = elementary professions) | | |
| Legislators, senior officials and managers | 0.66 | 1% |
| Professionals | 0.70 | 1% |
| Technicians and associate professionals | 0.54 | 1% |
| Clerks | 0.23 | 1% |
| Service workers and shop and market sales workers | 0.15 | 1% |
| Skilled agricultural and fishery workers | 1.27 | 1% |
| Craft and related trades workers | 0.17 | 1% |
| Plant and machine operators and assemblers | 0.00 | n.s. |
| | | |
| Sector (base = agriculture) | | |
| Industry | 0.27 | 1% |
| Services | 0.70 | 1% |
| | | |
| Treated group of age 55-59 (base = aged 35-39) | -1.92 | 1% |
| | | |
| Year (base = 2003) | | |
| 1992 | 0.16 | 1% |
| 1993 | 0.16 | 1% |
| 1994 | 0.09 | 1% |
| 1995 | 0.01 | n.s. |
| 1996 | -0.08 | 10% |
| 1997 | -0.10 | 1% |
| 1998 | -0.26 | 1% |
| 1999 | -0.25 | 1% |
| 2000 | -0.15 | 1% |
| 2001 | -0.15 | 1% |
| 2002 | -0.04 | n.s. |
| 2004 | -0.54 | 1% |
| 2005 | -0.56 | 1% |
| 2006 | -0.51 | 1% |
| 2007 | -0.52 | 1% |
| 2008 | -0.55 | 1% |
| 2009 | -0.68 | 1% |
| 2010 | -0.72 | 1% |

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| 2011 | -0.74 | 1% |
| 2012 | -0.94 | 1% |
| 2013 | -1.02 | 1% |
| 2014 | -1.10 | 1% |
| 2015 | -1.09 | 1% |
| 2016 | -0.99 | 1% |
| | | |
| Interaction year and treatment group (base == not treated and 2003) | | |
| 1 1992 | 0.03 | n.s. |
| 1 1993 | 0.02 | n.s. |
| 1 1994 | -0.04 | n.s. |
| 1 1995 | -0.12 | 10% |
| 1 1996 | -0.03 | n.s. |
| 1 1997 | -0.10 | 10% |
| 1 1998 | -0.05 | n.s. |
| 1 1999 | -0.04 | n.s. |
| 1 2000 | -0.13 | 1% |
| 1 2001 | -0.10 | n.s. |
| 1 2002 | -0.04 | n.s. |
| 1 2004 | 0.40 | 1% |
| 1 2005 | 0.50 | 1% |
| 1 2006 | 0.50 | 1% |
| 1 2007 | 0.57 | 1% |
| 1 2008 | 0.65 | 1% |
| 1 2009 | 0.94 | 1% |
| 1 2010 | 1.10 | 1% |
| 1 2011 | 1.25 | 1% |
| 1 2012 | 1.52 | 1% |
| 1 2013 | 1.64 | 1% |
| 1 2014 | 1.80 | 1% |
| 1 2015 | 1.86 | 1% |
| 1 2016 | 1.84 | 1% |
| | | |
| Constant | 0.93 | 1% |

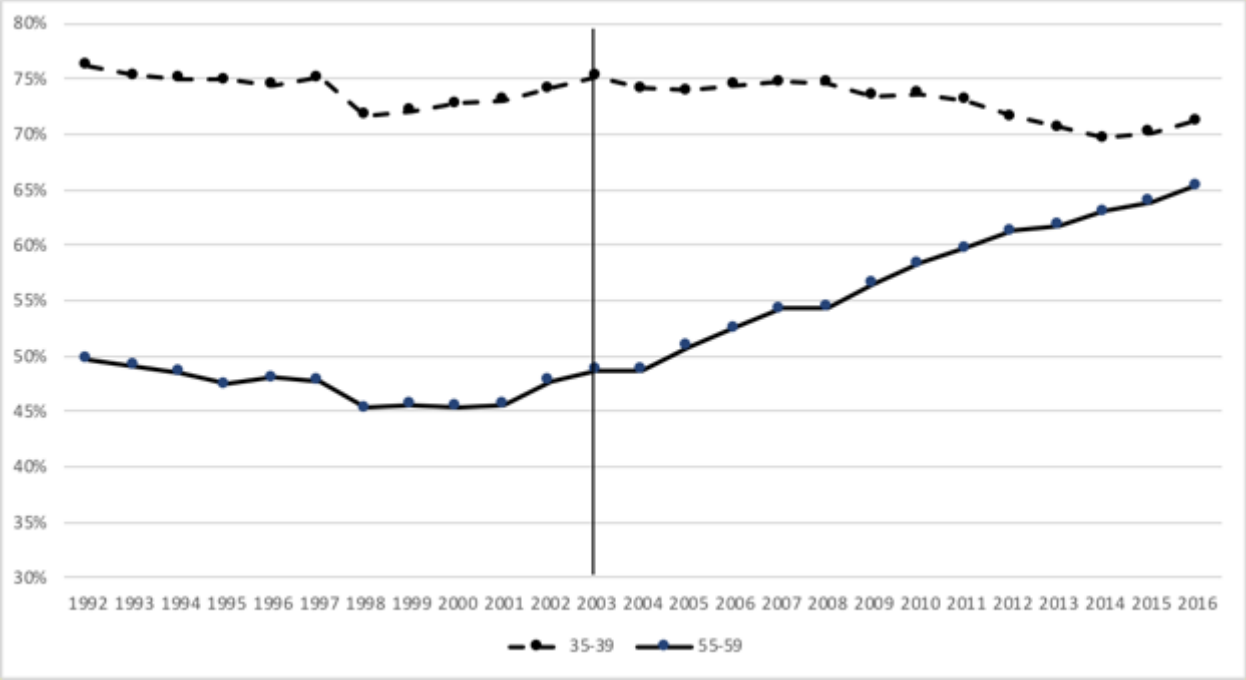


**Figure 41 — Employment rates of the treatment (55-59 years old) and control (35-39 years old) groups, %, Model 2 (without normally retired; (before removal of missing variables)**

**Table 32 — Logistic regression, analytical analysis of the parallel trend, Model 2**

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| Gender (base = female) | | |
| Male | 1.05 | 1% |
| | | |
| Level of education (base = elementary) | | |
| upper sec | 0.33 | 1% |
| tertiary | 0.61 | 1% |
| | | |
| Additional education or training in the las 4 weeks (base = no education or training) | 0.16 | 1% |
| | | |
| Macroregion (North-West) | | |
| North-East | 0.07 | 1% |
| Center | -0.13 | 1% |
| South | -0.56 | 1% |
| Islands | -0.65 | 1% |

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| | | |
| ISCO (base = elementary professions) | | |
| Legislators, senior officials and managers | 0.66 | 1% |
| Professionals | 1.03 | 1% |
| Technicians and associate professionals | 0.82 | 1% |
| Clerks | 0.54 | 1% |
| Service workers and shop and market sales workers | 0.12 | 1% |
| Skilled agricultural and fishery workers | 1.24 | 1% |
| Craft and related trades workers | 0.25 | 1% |
| Plant and machine operators and assemblers | 0.26 | 1% |
| | | |
| Sector (base = agriculture) | | |
| Industry | 0.27 | 1% |
| Services | 0.71 | 1% |
| | | |
| Treated group of age 55-59 (base = aged 35-39) | -0.71 | 1% |
| | | |
| Year (base = 2003) | | |
| 1992 | 0.18 | 1% |
| 1993 | 0.17 | 1% |
| 1994 | 0.10 | 10% |
| 1995 | 0.01 | n.s. |
| 1996 | -0.08 | n.s. |
| 1997 | -0.11 | 1% |
| 1998 | -0.27 | 1% |
| 1999 | -0.25 | 1% |
| 2000 | -0.15 | 1% |
| 2001 | -0.16 | 1% |
| 2002 | -0.04 | n.s. |
| 2004 | -0.55 | 1% |
| 2005 | -0.56 | 1% |
| 2006 | -0.51 | 1% |
| 2007 | -0.52 | 1% |
| 2008 | -0.55 | 1% |
| 2009 | -0.68 | 1% |
| 2010 | -0.72 | 1% |

| Employed (with normally retired in the base) | Coefficients | Significance level |
|---|---|---|
| 2011 | -0.73 | 1% |
| 2012 | -0.93 | 1% |
| 2013 | -1.02 | 1% |
| 2014 | -1.09 | 1% |
| 2015 | -1.08 | 1% |
| 2016 | -0.97 | 1% |
| | | |
| Interaction year and treatment group (base == not treated and 2003) | | |
| 1 1992 | -0.39 | 1% |
| 1 1993 | -0.33 | 1% |
| 1 1994 | -0.22 | 1% |
| 1 1995 | -0.30 | 1% |
| 1 1996 | -0.18 | 5% |
| 1 1997 | -0.10 | n.s. |
| 1 1998 | -0.14 | 10% |
| 1 1999 | -0.13 | 10% |
| 1 2000 | -0.18 | 5% |
| 1 2001 | -0.13 | 5% |
| 1 2002 | -0.04 | n.s. |
| 1 2004 | 0.38 | 1% |
| 1 2005 | 0.40 | 1% |
| 1 2006 | 0.42 | 1% |
| 1 2007 | 0.46 | 1% |
| 1 2008 | 0.29 | 1% |
| 1 2009 | 0.43 | 1% |
| 1 2010 | 0.50 | 1% |
| 1 2011 | 0.58 | 1% |
| 1 2012 | 0.68 | 1% |
| 1 2013 | 0.72 | 1% |
| 1 2014 | 0.82 | 1% |
| 1 2015 | 0.87 | 1% |
| 1 2016 | 0.83 | 1% |
| | | |
| Constant | 0.92 | 1% |

# Appendix 4 — Chapter 2. DID analysis results (Model 1)

**Table 33 — Number of cases, Model 2, 1992-2016**

| | Before | After | Total |
|---|---|---|---|
| Control | 137369 | 448177 | 585546 |
| Treated | 94720 | 381295 | 476015 |
| Total | 232089 | 829472 | 1061561 |

**Table 34 — DID analysis results, Model 1, 1992-2016**

| Outcome variable | Probability of being employed (Model 1) | Standard error | Significance level |
|---|---|---|---|
| Before | | | |
| Control | 0.740 | | |
| Treated | 0.435 | | |
| Diff (T-C) | - 0.305 | 0.002 | 1% |
| | | | |
| After | | | |
| Control | 0.665 | | |
| Treated | 0.540 | | |
| Diff (T-C) | - 0.125 | 0.001 | 1% |
| | | | |
| DID | 0.179 | 0.002 | 1% |
| | | | |
| R-square | 0.12 | | |

**Table 35 — Number of cases, Model 1, 1999-2007**

| | Before | After | Total |
|---|---|---|---|
| Control | 60545 | 137881 | 198426 |
| Treated | 38383 | 104788 | 143171 |

| | Before | After | Total |
|---|---|---|---|
| Total | 98928 | 242669 | 341597 |

**Table 36 — DID analysis results, Model 1, 1999-2007**

| Outcome variable | Probability of being employed (Model 1) | Standard error | Significance |
|---|---|---|---|
| Before | | | |
| Control | 0.765 | | |
| Treated | 0.448 | | |
| Diff (T-C) | - 0.317 | 0.003 | 1% |
| | | | |
| After | | | |
| Control | 0.723 | | |
| Treated | 0.484 | | |
| Diff (T-C) | - 0.239 | 0.003 | 1% |
| | | | |
| DID | 0.079 | 0.004 | 1% |
| | | | |
| R-square | 0.15 | | |

**Table 37 — Number of cases, Model 1, 2002-2004**

| | Before | After | Total |
|---|---|---|---|
| Control | 24282 | 10865 | 35147 |
| Treated | 15660 | 7473 | 23133 |
| Total | 39942 | 18338 | 58280 |

**Table 38 — DID analysis results, Model 1, 2002-2004**

| Outcome variable | Probability of being employed (Model 1) | Standard error | Significance |
|---|---|---|---|
| Before | | | |

| Outcome variable | Probability of being employed (Model 1) | Standard error | Significance |
|---|---|---|---|
| Control | 0.791 | | |
| Treated | 0.499 | | |
| Diff (T-C) | - 0.293 | 0.005 | 1% |
| | | | |
| After | | | |
| Control | 0.740 | | |
| Treated | 0.478 | | |
| Diff (T-C) | - 0.263 | 0.008 | 1% |
| | | | |
| DID | 0.030 | 0.009 | 1% |
| | | | |
| R-square | 0.15 | | |

# Appendix 5 — Chapter 2. DID analysis results (Model 2)

**Table 39 — Number of cases, Model 2, 1992-2016**

| | Before | After | Total |
|---|---|---|---|
| Control | 137231 | 448158 | 585389 |
| Treated | 69354 | 329483 | 389837 |
| Total | 206585 | 777641 | 984226 |

**Table 40 — DID analysis results, Model 2, 1992-2016**

| Outcome variable | Probability of being employed (Model 2) | Standard error | Significance |
|---|---|---|---|
| Before | | | |
| Control | 0.812 | | |
| Treated | 0.716 | | |
| Diff (T-C) | - 0.097 | 0.002 | 1% |
| | | | |
| After | | | |
| Control | 0.741 | | |
| Treated | 0.722 | | |
| Diff (T-C) | - 0.019 | 0.001 | 1% |
| | | | |
| DID | 0.078 | 0.002 | 1% |
| | | | |
| R-square | 0.07 | | |

**Table 41 — Number of cases, Model 2, 1999-2007**

| | Before | After | Total |
|---|---|---|---|
| Control | 60518 | 137872 | 198390 |
| Treated | 69354 | 329483 | 107058 |
| Total | 27680 | 79378 | 305448 |

**Table 42 — DID analysis results, Model 2, 1999-2007**

| Outcome variable | Probability of being employed (Model 2) | Standard error | Significance |
|---|---|---|---|
| Before | | | |
| Control | 0.827 | | |
| Treated | 0.733 | | |
| Diff (T-C) | - 0.094 | 0.003 | 1% |
| | | | |
| After | | | |

| | | | |
|---|---|---|---|
| Control | 0.788 | | |
| Treated | 0.749 | | |
| Diff (T-C) | - 0.039 | 0.002 | 1% |
| | | | |
| DID | 0.055 | 0.004 | 1% |
| | | | |
| R-square | 0.08 | | |

**Table 43 — Number of cases, Model 2, 2002-2004**

| | Before | After | Total |
|---|---|---|---|
| Control | 24271 | 10864 | 35135 |
| Treated | 11571 | 5459 | 17030 |
| Total | 35842 | 16323 | 51165 |

**Table 44 — DID analysis results, Model 2, 2002-2004**

| Outcome variable | Probability of being employed (Model 2) | Standard error | Significance |
|---|---|---|---|
| Before | | | |
| Control | 0.856 | | |
| Treated | 0.779 | | |
| Diff (T-C) | - 0.078 | 0.004 | 1% |
| | | | |
| After | | | |
| Control | 0.807 | | |
| Treated | 0.761 | | |
| Diff (T-C) | - 0.046 | 0.007 | 1% |
| | | | |
| DID | 0.031 | 0.008 | 1% |
| | | | |
| R-square | 0.08 | | |

# Appendix 6 — Chapter 3. Variables used in the experiment

### Table 45 — Electrician

| n | VACANCY | SEX | AGE | EDUCATION *(specialized secondary education in the required field)* CONSTANT | UNDERGOING ADDITIONAL TRAINING | YEARS OF RELEVANT EXPERIENCE | CODE |
|---|---|---|---|---|---|---|---|
| 1 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 2 | ELECTRICIAN | M | 50 | SSE_RF | NO | 10 | B |
| 3 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 4 | ELECTRICIAN | M | 50 | SSE_RF | NO | 25 | C |
| 5 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 6 | ELECTRICIAN | M | 50 | SSE_RF | YES | 25 | D |
| 7 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 8 | ELECTRICIAN | F | 50 | SSE_RF | NO | 10 | F |
| 9 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 10 | ELECTRICIAN | F | 50 | SSE_RF | NO | 25 | G |
| 11 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 12 | ELECTRICIAN | F | 50 | SSE_RF | YES | 25 | H |
| 13 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 14 | ELECTRICIAN | F | 50 | SSE_RF | NO | 10 | F |
| 15 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 16 | ELECTRICIAN | F | 50 | SSE_RF | NO | 25 | G |
| 17 | ELECTRICIAN | M | 35 | SSE_RF | NO | 10 | A |
| 18 | ELECTRICIAN | F | 50 | SSE_RF | YES | 25 | H |
| 19 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 20 | ELECTRICIAN | M | 50 | SSE_RF | NO | 10 | B |
| 21 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 22 | ELECTRICIAN | M | 50 | SSE_RF | NO | 25 | C |
| 23 | ELECTRICIAN | F | 35 | SSE_RF | NO | 10 | E |
| 24 | ELECTRICIAN | M | 50 | SSE_RF | YES | 25 | D |

### Table 46 — Managing Director

| n | VACANCY | SEX | AGE | EDUCATION *(higher education in* | UNDERGOING ADDITIONAL TRAINING | YEARS OF RELEVANT EXPERIENCE | CODE |
|---|---|---|---|---|---|---|---|

| | | | | *the required field)*<br><br>CONSTANT | | | |
|---|---|---|---|---|---|---|---|
| 1 | MANAGINS DIRECTOR | M | 38 | SSE_RF | NO | 10 | A |
| 2 | MANAGINS DIRECTOR | M | 53 | HE RF | NO | 10 | B |
| 3 | MANAGINS DIRECTOR | M | 38 | HE RF | NO | 10 | A |
| 4 | MANAGINS DIRECTOR | M | 53 | HE RF | NO | 25 | C |
| 5 | MANAGINS DIRECTOR | M | 38 | HE RF | NO | 10 | A |
| 6 | MANAGINS DIRECTOR | M | 53 | HE RF | YES | 25 | D |
| 7 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 8 | MANAGINS DIRECTOR | F | 53 | HE RF | NO | 10 | F |
| 9 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 10 | MANAGINS DIRECTOR | F | 53 | HE RF | NO | 25 | G |
| 11 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 12 | MANAGINS DIRECTOR | F | 53 | HE RF | YES | 25 | H |
| 13 | MANAGINS DIRECTOR | M | 38 | HE RF | NO | 10 | A |
| 14 | MANAGINS DIRECTOR | F | 53 | HE RF | NO | 10 | F |
| 15 | MANAGINS DIRECTOR | M | 38 | HE RF | NO | 10 | A |
| 16 | MANAGINS DIRECTOR | F | 53 | HE RF | NO | 25 | G |
| 17 | MANAGINS DIRECTOR | M | 38 | HE RF | NO | 10 | A |
| 18 | MANAGINS DIRECTOR | F | 53 | HE RF | YES | 25 | H |
| 19 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 20 | MANAGINS DIRECTOR | M | 53 | HE RF | NO | 10 | B |
| 21 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 22 | MANAGINS DIRECTOR | M | 53 | HE RF | NO | 25 | C |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 23 | MANAGINS DIRECTOR | F | 38 | HE RF | NO | 10 | E |
| 24 | MANAGINS DIRECTOR | M | 53 | HE RF | YES | 25 | D |

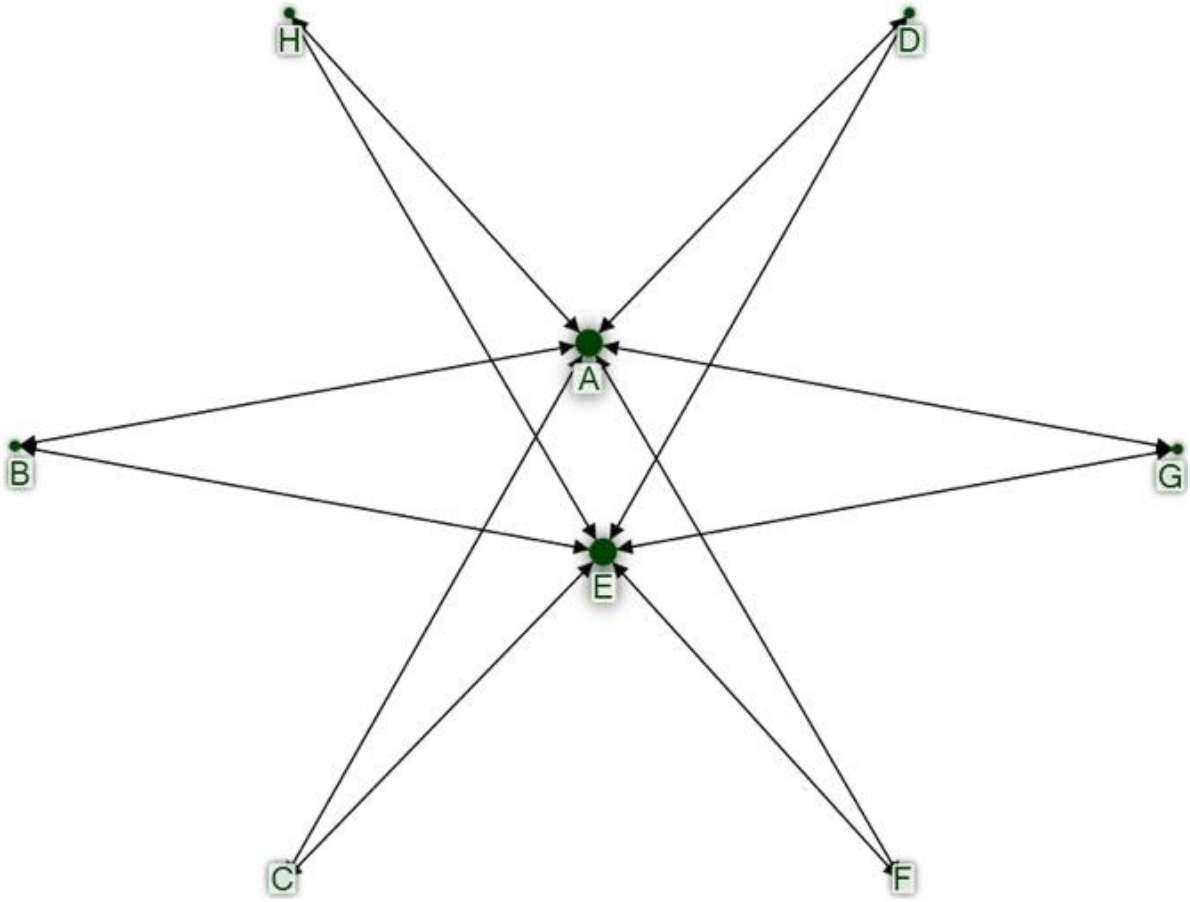


**Figure 42 — Comparisons that can be made between variables**

# Appendix 7 — Chapter 3. Materials presented to the candidates

## Introduction

## Introduction — control group

You will participate in an experiment that simulates job market situations.

You will act as recruiters and will be presented with a variety of job vacancies and candidates for them.

You will need to choose candidates for each vacancy presented who you will consider the best fit for it.

When making your decisions please keep in mind the following information. The applicants have equal hiring costs for the employers, i.e. the wages, social security payments, etc. will be the same for all potential employees.

You will be paid at the end of the experiment.

## Introduction — treatment group

You will participate in an experiment that simulates job market situations.

You will act as recruiters and will be presented with a variety of job vacancies and candidates for them.

You will need to choose candidates for each vacancy presented who you will consider the best fit for it.

When making your decisions please keep in mind the following information. The applicants have equal hiring costs for the employers, i.e. the wages, social security payments, etc. will be the same for all potential employees.

You will be paid at the end of the experiment.

This experiment has already taken place among other students. The amount of the payment you will receive will be calculated in the following way. For each response that will correspond to the majority of responses given by the previous group (i.e. more than 50%), you will receive 80 cents, for every response that will not correspond to the majority of responses you will lose 80 cents. In case you end in a loss, you will receive 5 euros participation fee. After the experiment you will need to feel in the questionnaire after which you will be able to know your winnings that will be communicated to you directly by the experimenter.

## Resumes

### *First vacancy.*

A position of an electrician in a construction company.

Description: the successful candidate's key responsibilities will include electrical installation, repairs and maintenance work which should be of high quality, 'right first time' and cost effective.

Requirements: specialized secondary education; experience in a similar position of 3 years or more.

**First pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 10 years of relevant experience.

**Second pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 25 years of relevant experience.

**Third pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988), proof of undergoing additional training in 2010 and 2016 and 25 years of relevant experience.

**Fourth pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 10 years of relevant experience.

**Fifth pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 25 years of relevant experience.

**Sixth pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988), proof of undergoing additional training in 2010 and 2016 and 25 years of relevant experience.

**Seventh pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 10 years of relevant experience.

**Eighth pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 25 years of relevant experience.

**Ninth pair of resumes:**

1. First applicant is male, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is female, 50 years old, has specialized secondary education in the required field (graduated in 1988), proof of undergoing additional training in 2010 and 2016 and 25 years of relevant experience.

**Tenth pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 10 years of relevant experience.

**Eleventh pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988) and 25 years of relevant experience.

**Twelfth pair of resumes:**

1. First applicant is female, 35 years old, has specialized secondary education in the required field (graduated in 2003) and 10 years of relevant experience.
2. Second applicant is male, 50 years old, has specialized secondary education in the required field (graduated in 1988), proof of undergoing additional training in 2010 and 2016 and 25 years of relevant experience.

## *Second vacancy*

A position of a Managing Director in Mergers and Acquisitions (M&A) in an advisory firm.

Description: the successful candidate will be responsible for generation and execution of various M&A transactions (from the first discussions till the transactions' closings); for the communication of the regulatory and financial information, as well as complex strategic issues in order to help the decision-makers in corporate finance transactions; for the development and enhancement of client networks, for the development and execution of sales and marketing strategies; for the mentorship of his / her subordinates.

Requirements: Master's degree in Economics, Accounting or Finance; at least 15 years of professional experience in M&A.

**First pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 15 years ago.

**Second pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago.

**Third pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago and has proof of undergoing additional training every 2-3 years.

**Fourth pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago.

**Fifth pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting, started working in M&A 30 years ago.

**Sixth pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in investment banking as an intern 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in investment banking 30 years ago and has proof of undergoing additional training every 2-3 years.

**Seventh pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 15 years ago.

**Eighth pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago.

**Ninth pair of resumes:**

1. First applicant is male, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is female, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago and has proof of undergoing additional training every 2-3 years.

**Tenth pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 15 years ago.

**Eleventh pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago.

**Twelfth pair of resumes:**

1. First applicant is female, 38 years old, has Master's degree in Accounting (graduated in 2004), started working in M&A 15 years ago.
2. Second applicant is male, 53 years old, has Master's degree in Accounting (graduated in 1989), started working in M&A 30 years ago and has proof of undergoing additional training every 2-3

## Final questionnaire

1. Age
2. Gender
3. Which of the following words would best describe your general attitude towards and relationship with people aged 50 or more (choose no more than 3 answers)?
    1. Distant
    2. Sympathetic
    3. Wary
    4. Friendly
    5. Uneasy
    6. Co-operative
    7. Respectful

8. Interested
9. Indifferent
10. None of the above

4. Do you consider that most people over 50 are (choose no more than 3 answers)?
    1. Demanding
    2. Cheerful
    3. Helpful
    4. Difficult to please
    5. Easy to get on with
    6. Encouraging
    7. Very conservative
    8. Boring
    9. Flexible
    10. Interesting
    11. None on the above
5. Who would you believe to have a higher proficiency level: workers older or younger than 50?
    1. Younger than 50
    2. Older than 50
    3. The age does not matter
    4. Do not know
6. Who would you believe to be more dependable and responsible: workers older or younger than 50?
    1. Younger than 50
    2. Older than 50
    3. The age does not matter
    4. Do not know
7. Who would you believe to be better in group work: workers older or younger than 50?
    1. Younger than 50
    2. Older than 50
    3. The age does not matter
    4. Do not know
8. Who would you believe to be more productive: workers older or younger than 50?
    1. Younger than 50

2. Older than 50
3. The age does not matter
4. Do not know

9. Who would you believe to be better in mastering new technologies and methods of work: workers older or younger than 50?
   1. Younger than 50
   2. Older than 50
   3. The age does not matter
   4. Do not know
10. Who would you believe to be more prepared to work longer hours: workers older or younger than 50?
   1. Younger than 50
   2. Older than 50
   3. The age does not matter
   4. Do not know
11. Who would you believe to be taking sick leaves more often: workers older or younger than 50?
   1. Younger than 50
   2. Older than 50
   3. The age does not matter
   4. Do not know
12. Did you have any personal experience working with worker aged older than 50?
   1. Yes
   2. No
13. If yes, in which circumstances? (open question)

_____

14. If yes, would you consider it positive or negative?
   1. Positive
   2. Negative
   3. Do not know

15. How old is your mother?

_____

16. What is her occupation/What is his field of work?

_____

17. How old is your father?

_____

18. What is his profession/What is his field of work?

_____

19. Are you familiar with the legislation against discrimination based on age in the labour market?

1. Yes

2. No

# Appendix 8 — Chapter 3. Descriptive statistics

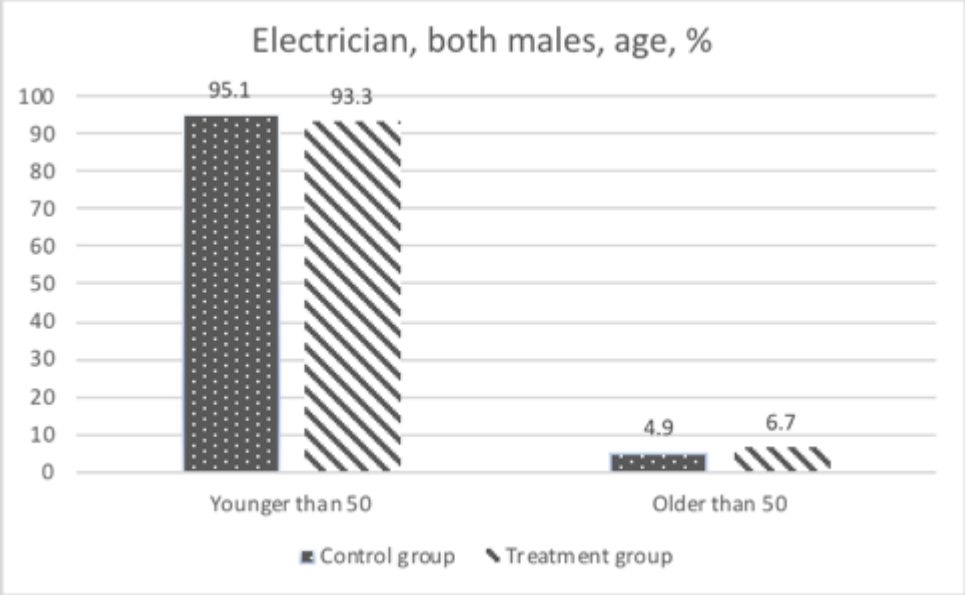


**Figure 43 — Vacancy of electrician, both males, differ only in age**

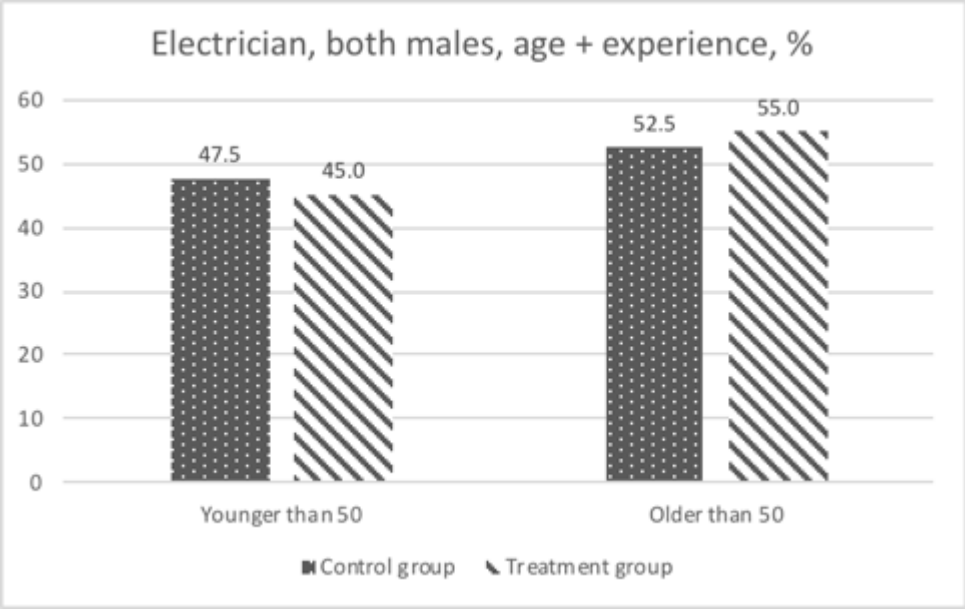


**Figure 44 — Vacancy of electrician, both males, differ in age and experience**

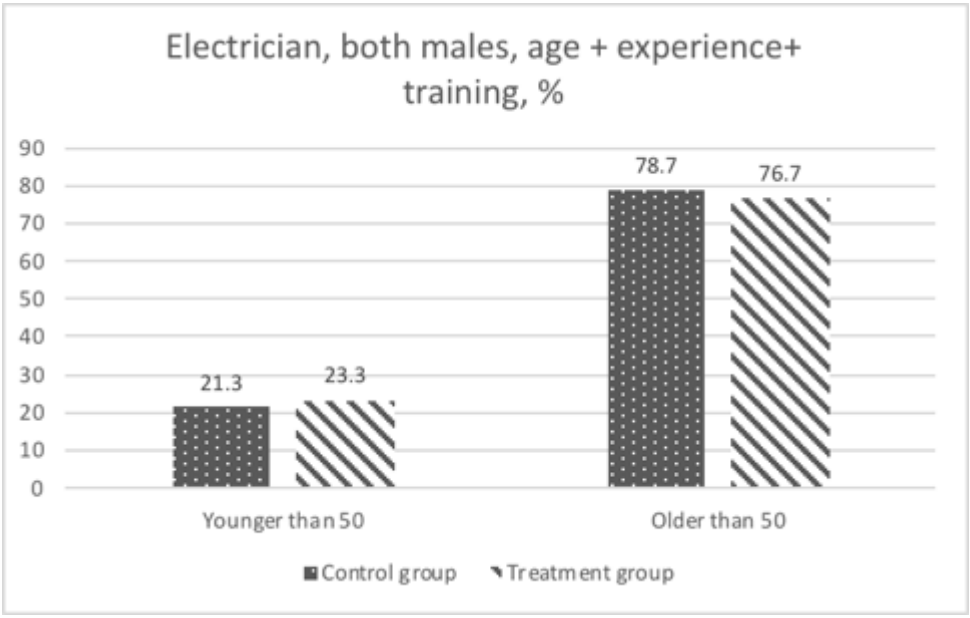


**Figure 45 — Vacancy of electrician, both males, differ in age, experience and additional training**

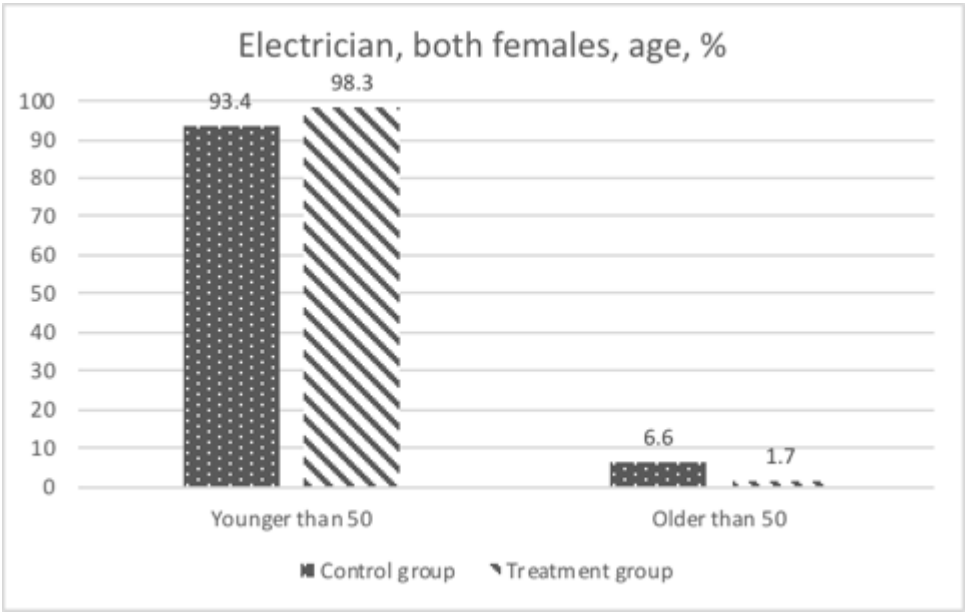


**Figure 46 — Vacancy of electrician, both females, differ only in age**

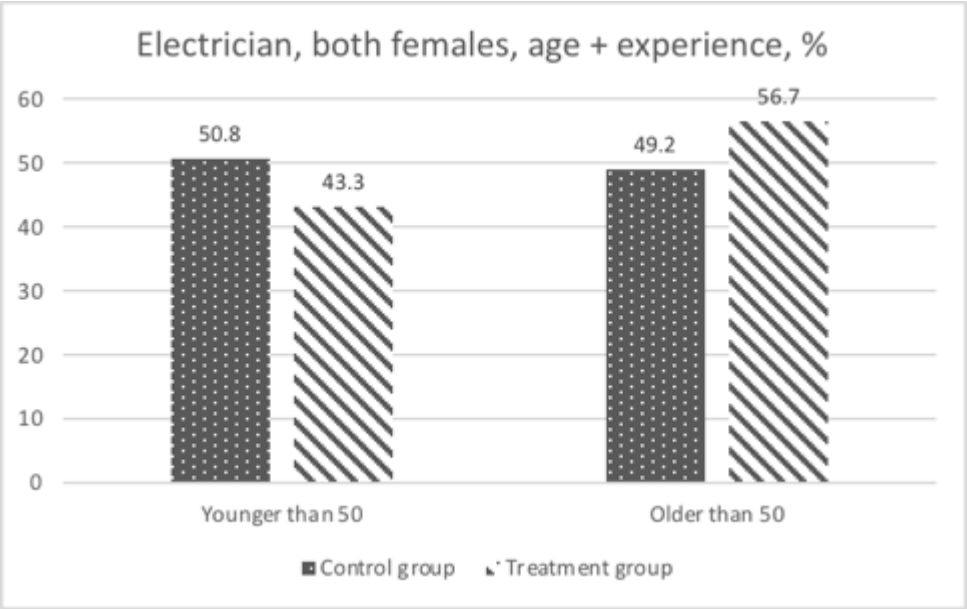


**Figure 47 — Vacancy of electrician, both females, differ in age and experience**

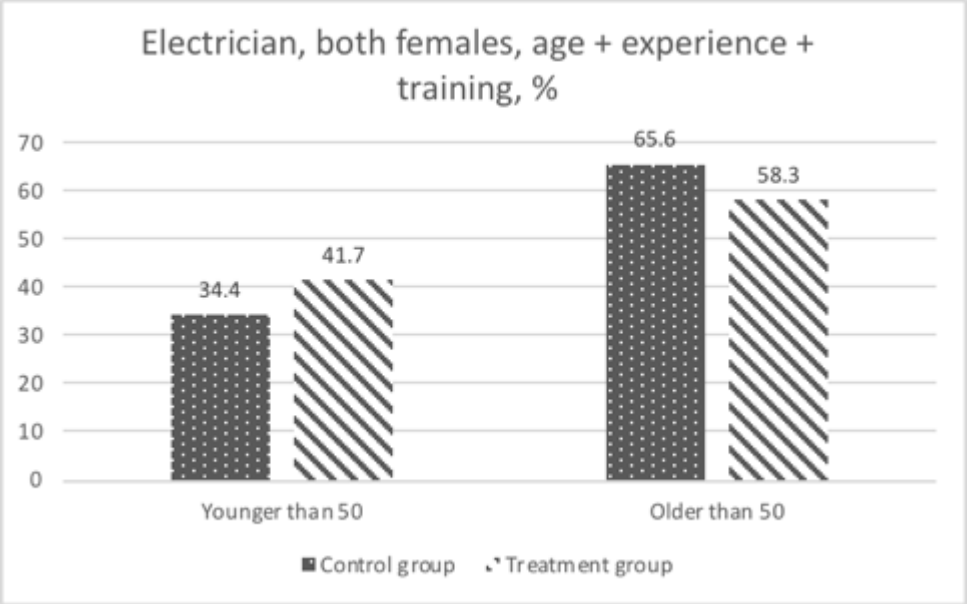


**Figure 48 — Vacancy of electrician, both females, differ in age, experience and additional training**

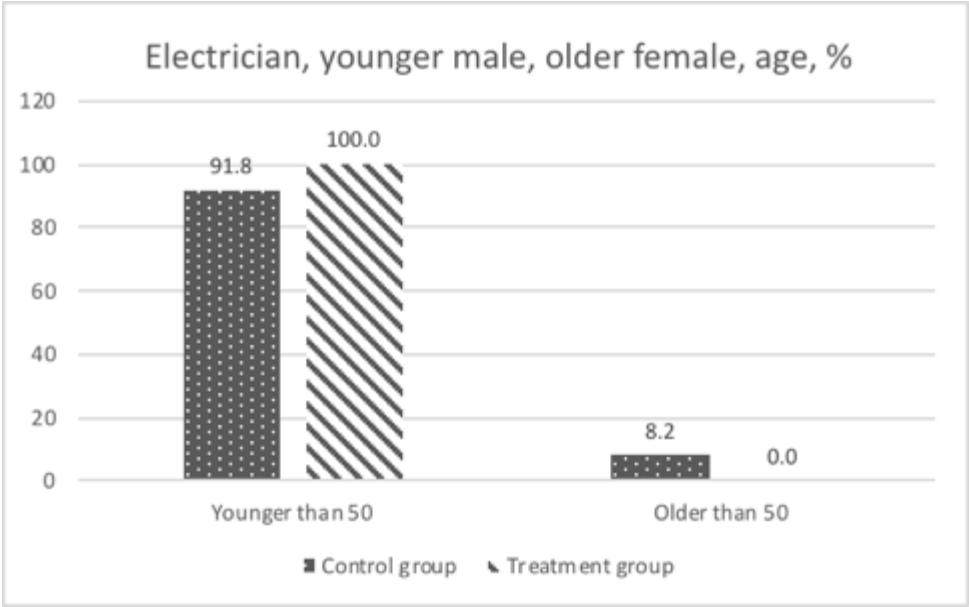


**Figure 49 — Vacancy of electrician, a younger male and an older female, differ only in age**

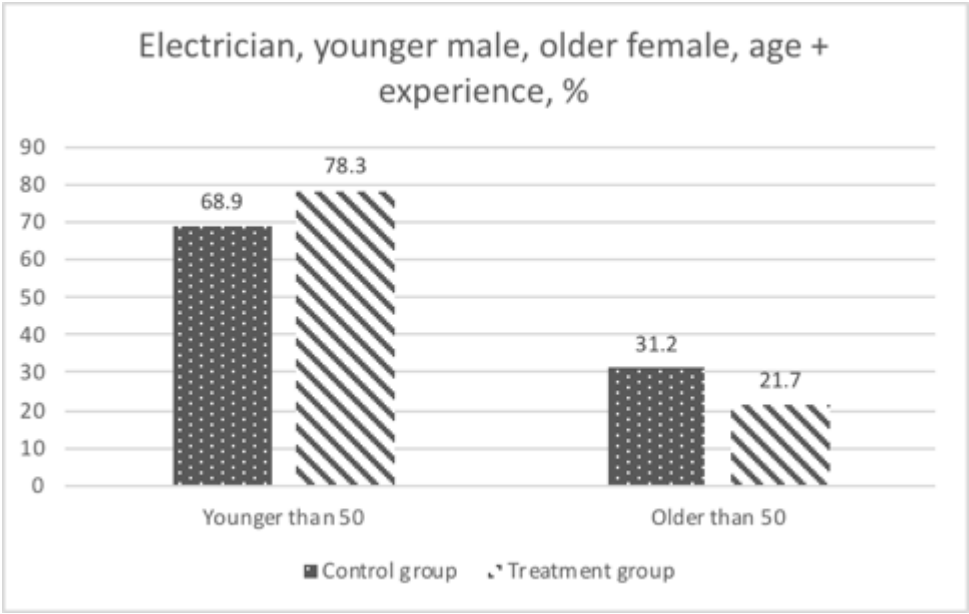


**Figure 50 — Vacancy of electrician, a younger male and an older female, differ in age and experience**

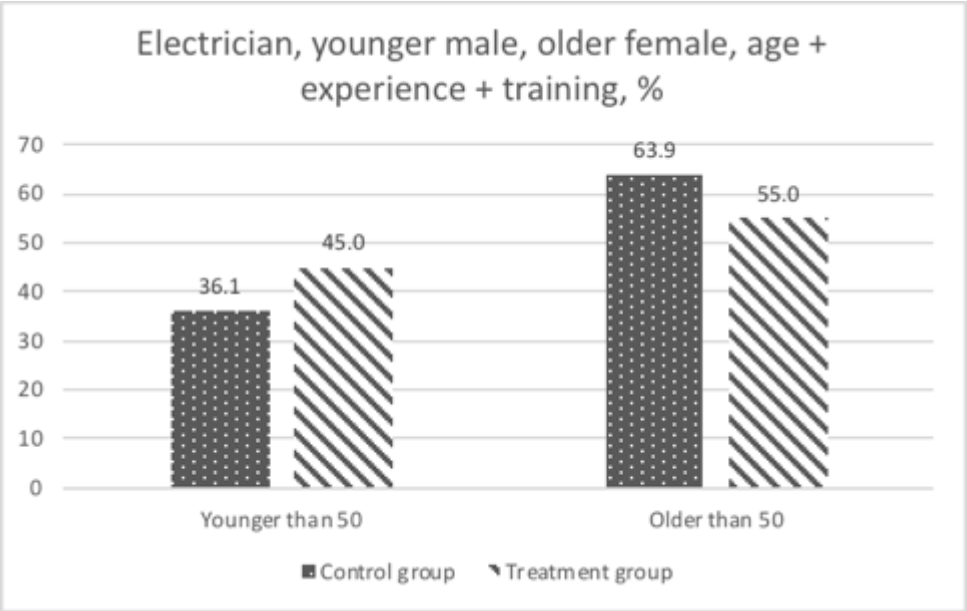


**Figure 51 — Vacancy of electrician, a younger male and an older female, differ in age, experience and training**

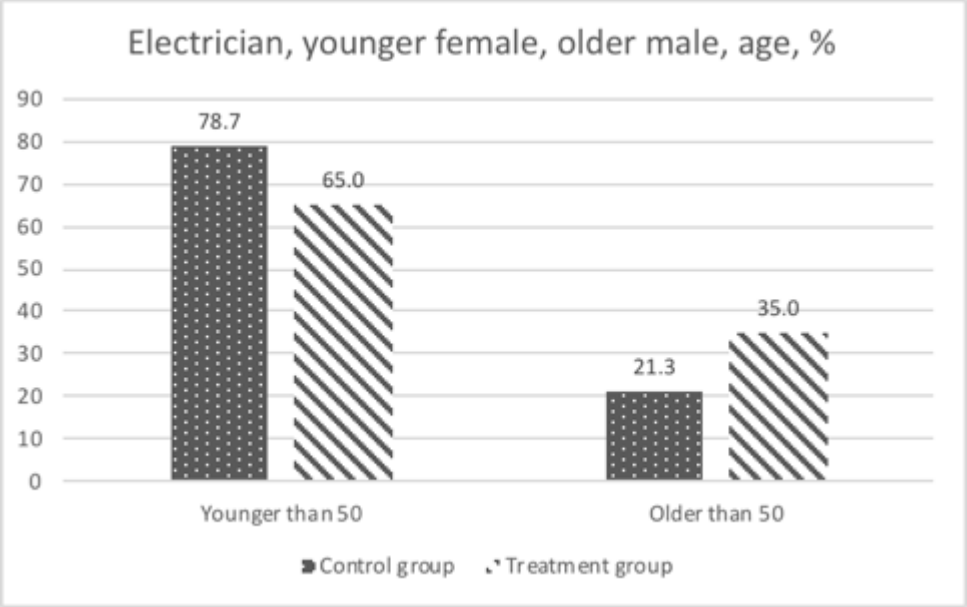


**Figure 52 — Vacancy of electrician, a younger female and an older male, differ only in age**

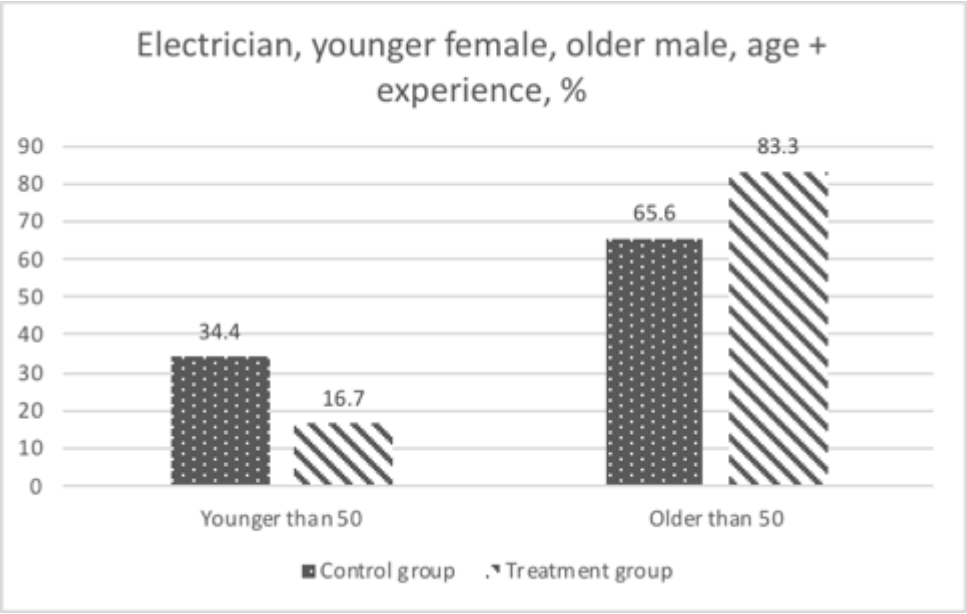


**Figure 53 — Vacancy of electrician, a younger female and an older male, differ in age and experience**

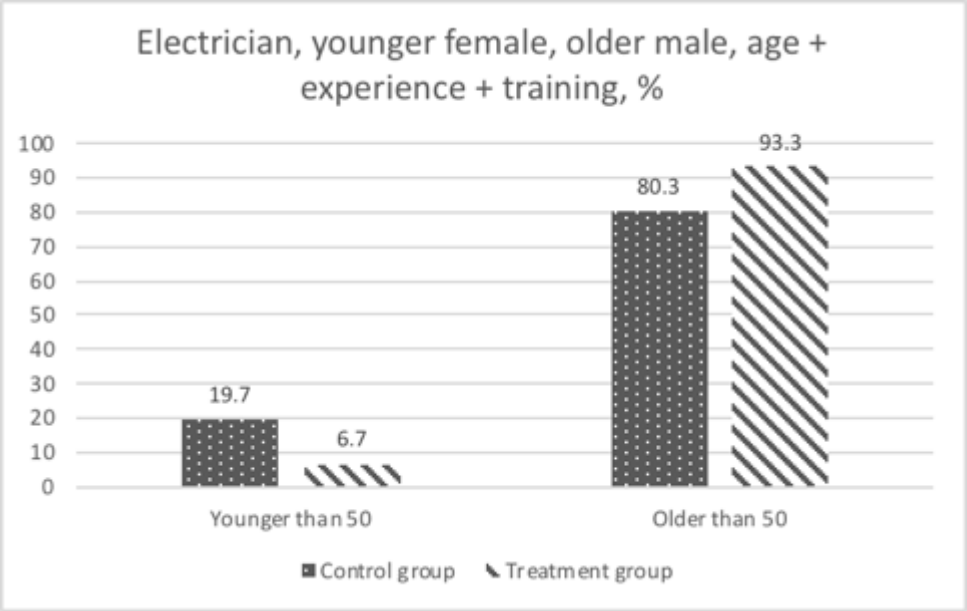


**Figure 54 — Vacancy of electrician, a younger female and an older male, differ in age, experience and training**

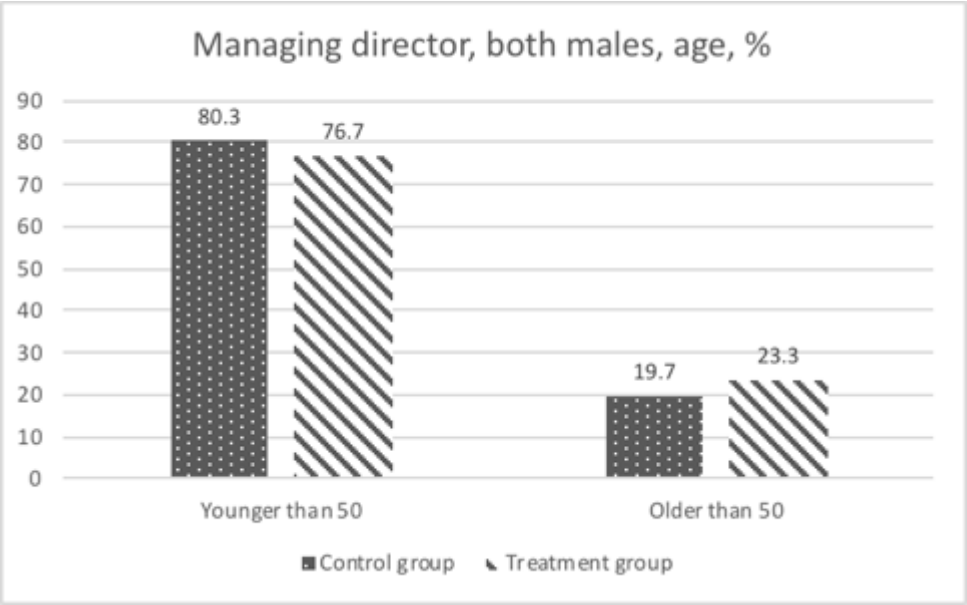


**Figure 55 — Vacancy of Managing director, both males, differ only in age**

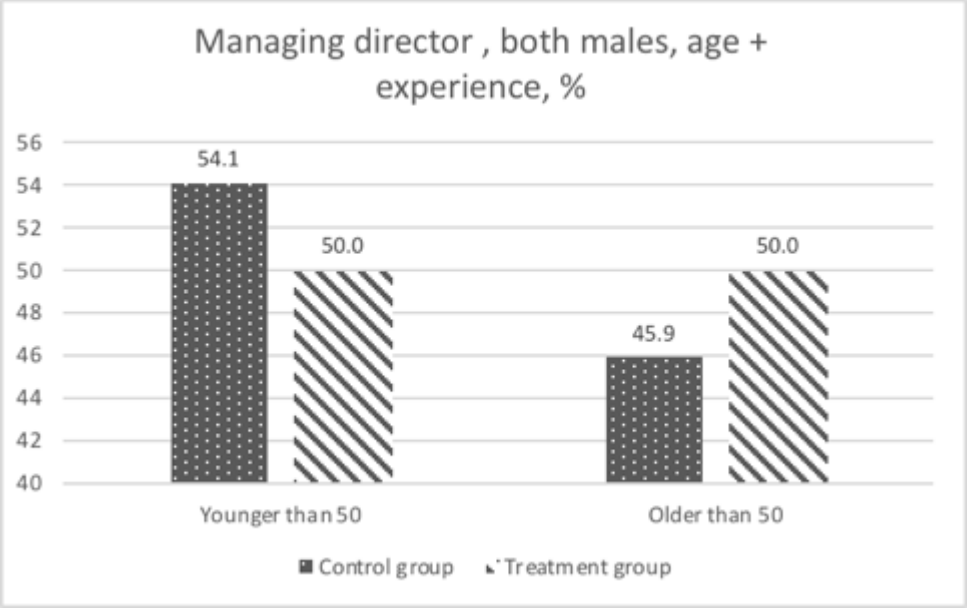


**Figure 56 — Vacancy of Managing director, both males, differ in age**

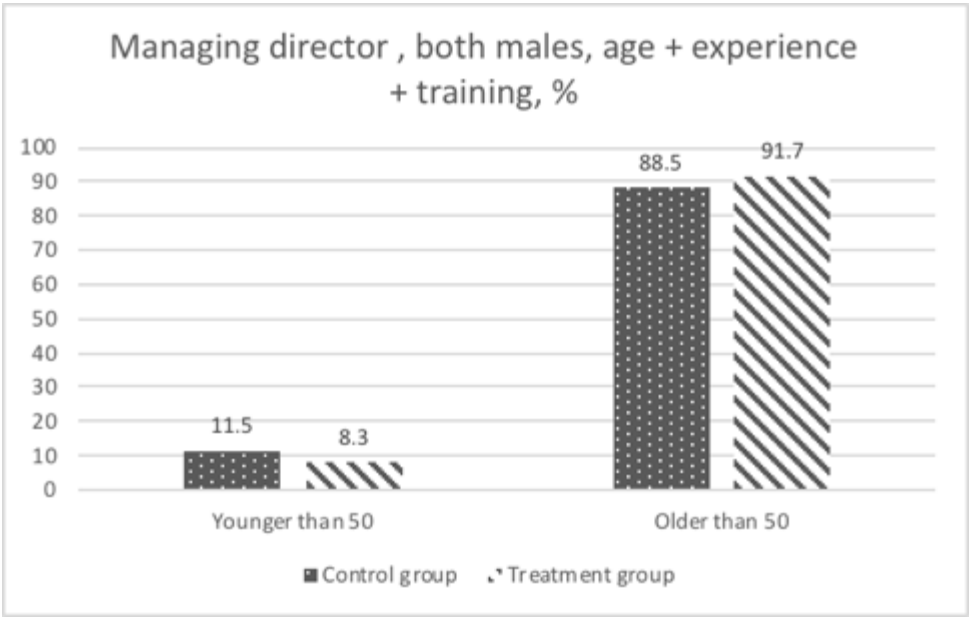


**Figure 57 — Vacancy of Managing director, both males, differ age, experience and training**

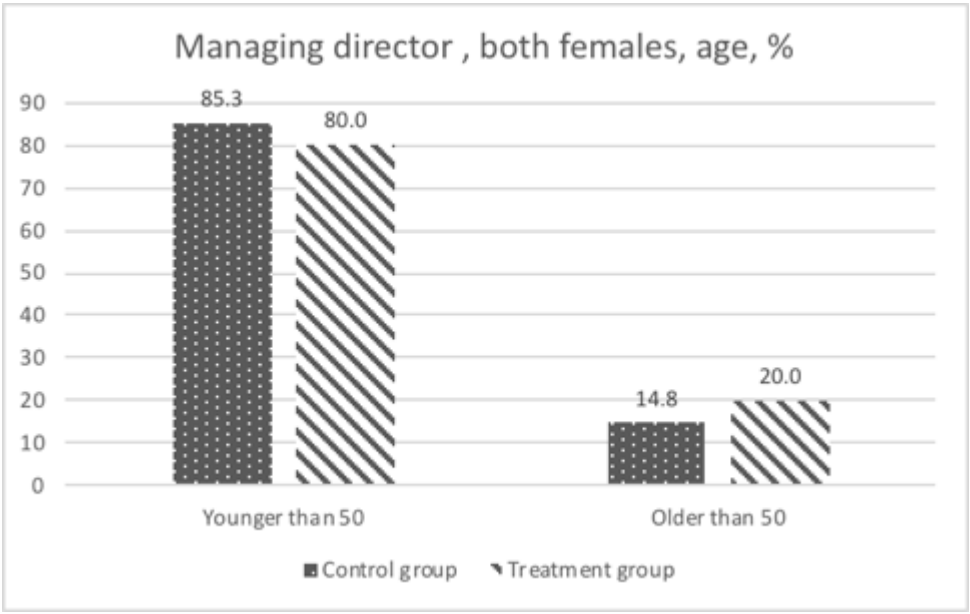


**Figure 58 — Vacancy of Managing director, both females, differ only in age**

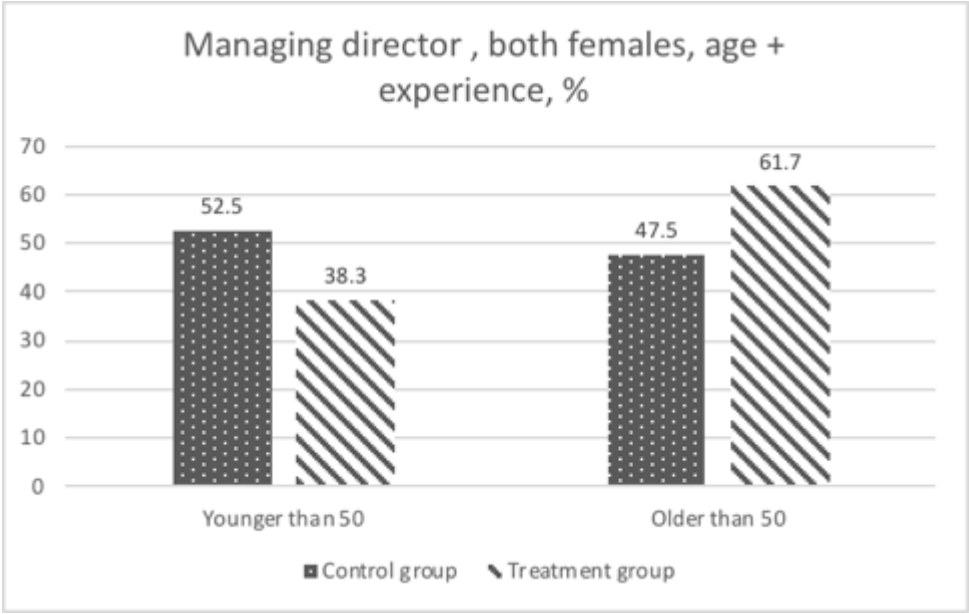


**Figure 59 — Vacancy of Managing director, both females, differ in age and experience**

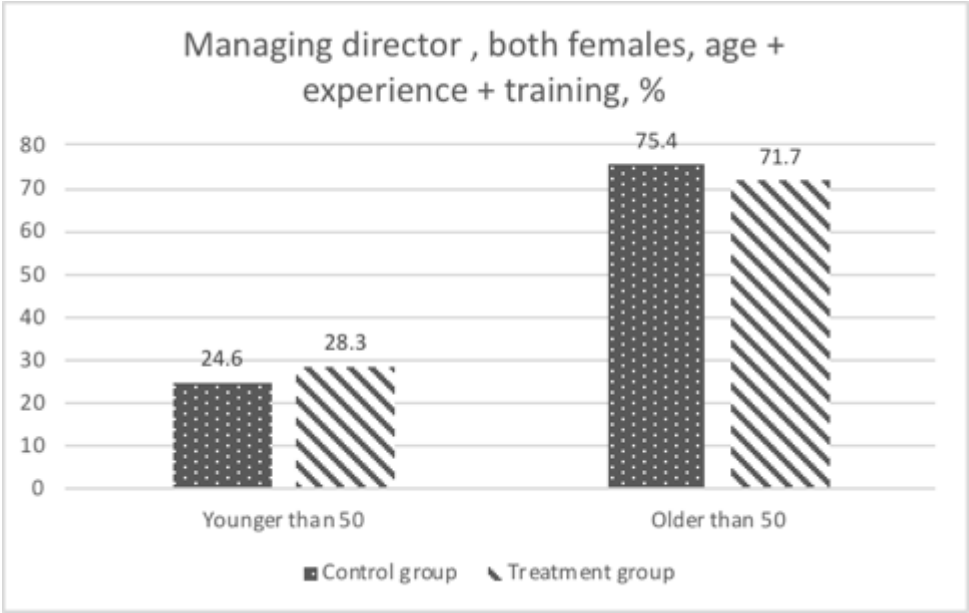


**Figure 60 — Vacancy of Managing director, both females, differ in age, experience and training**

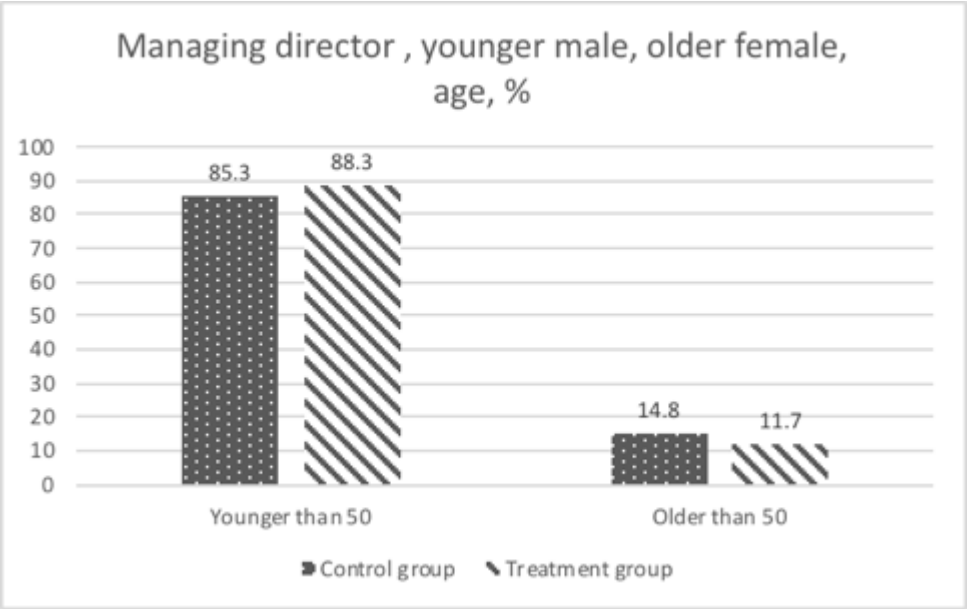


**Figure 61 — Vacancy of Managing director, younger male, older female, differ only in age**

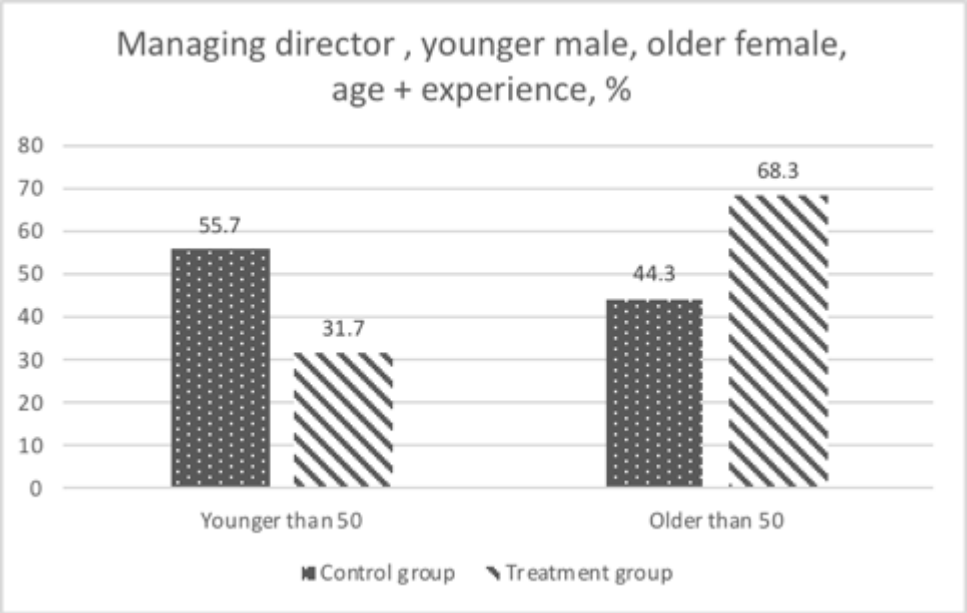


**Figure 62 — Vacancy of Managing director, younger male, older female, differ in age and experience**

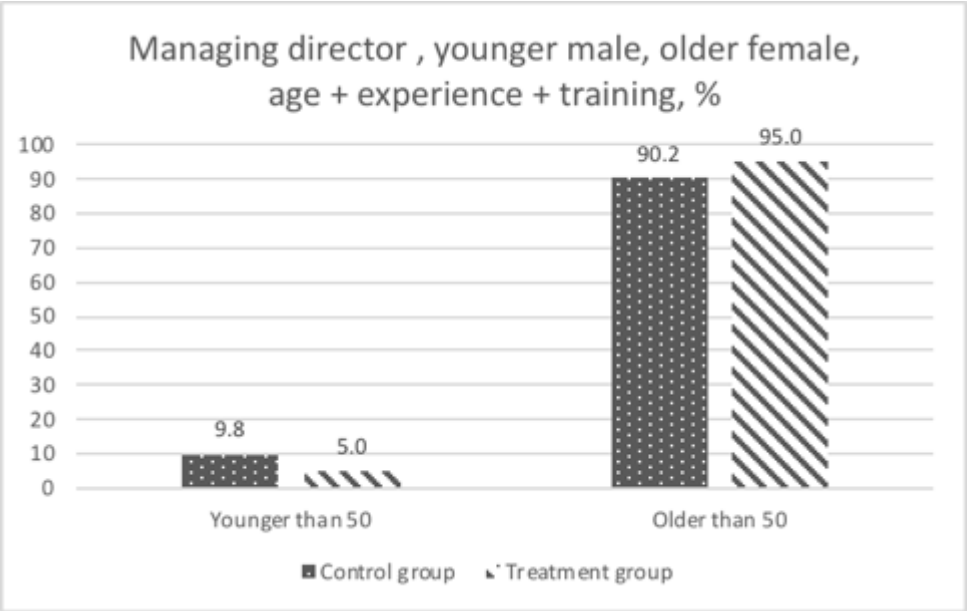


**Figure 63 — Vacancy of Managing director, younger male, older female, differ in age, experience and training**

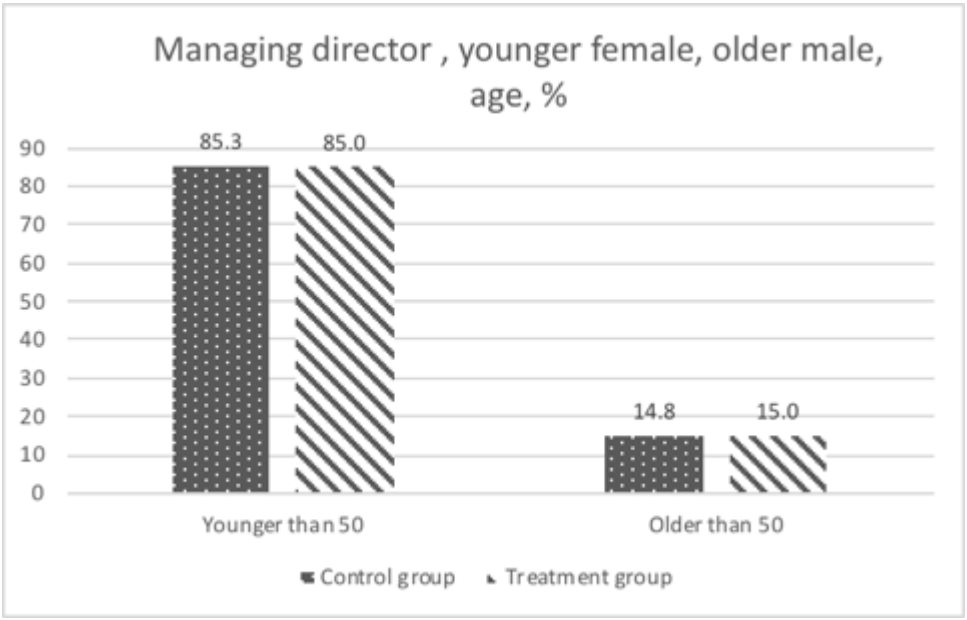


**Figure 64 — Vacancy of Managing director, younger female, older male, differ only in age**

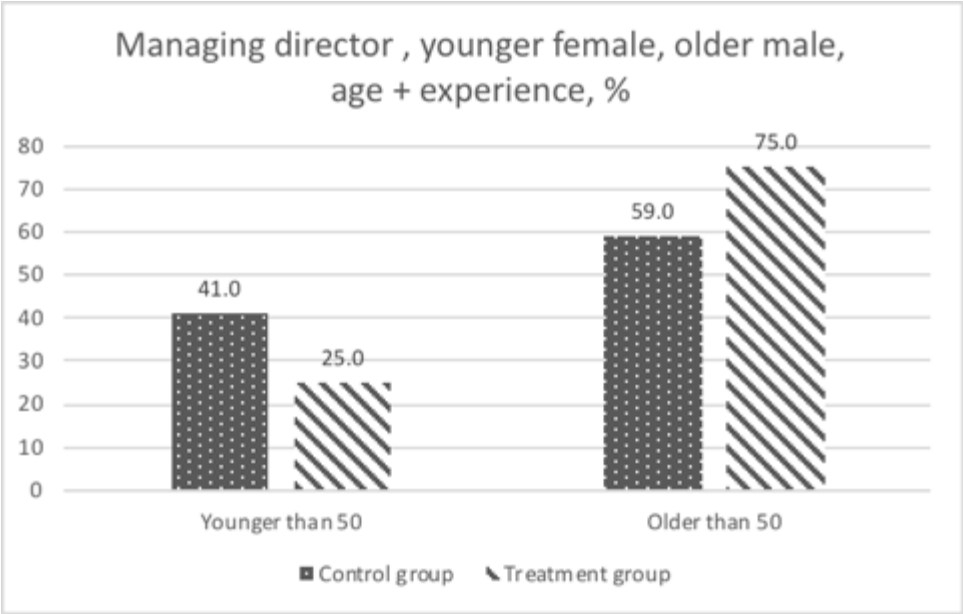


**Figure 65 — Vacancy of Managing director, younger female, older male, differ in age and experience**

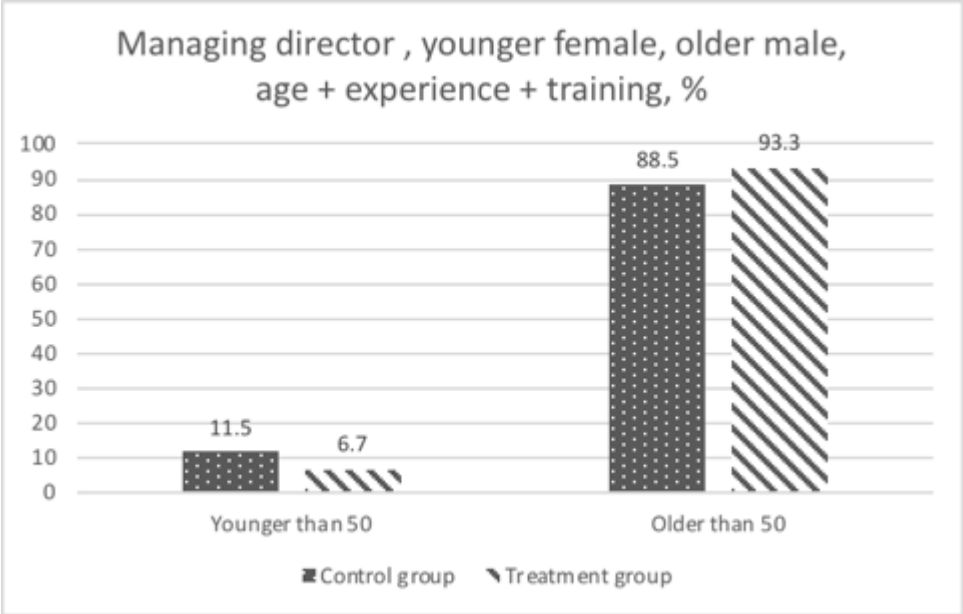


**Figure 66 — Vacancy of Managing director, younger female, older male, differ in age, experience and training**

# Appendix 9 — Chapter 3. Results of the contingency tests

**Table 47 — Results of Chi-square, Cramer V, Fisher exact and Kendall's Tau-b tests to test Hypothesis 1 and 2 (control group)**

| **Variables compared with treatment variable (Electrician vs. Managing Director)** | **Pearson chi2** | **P-value** | **Cramer's V** | **Fisher exact test** | | **Kendall's Tau-b** | |
|---|---|---|---|---|---|---|---|
| | | | | **2-sided** | **1-sided** | **Statistics value** | **P-value** |
| Both males, same experience and training | 0.3726 | 0.542 | 0.0782 | 0.488 | 0.488 | 0.0782 | 0.5611 |
| Both males, same training, older candidate has more experience | 0.4553 | 0.500 | 0.0864 | 0.609 | 0.338 | 0.0864 | 0.5087 |
| ***Both males, older person has more experience and recent training*** | ***6.0539*** | ***0.014*** | ***0.3150*** | ***0.032*** | ***0.032*** | ***0.3150*** | ***0.0153*** |
| Both females, same experience and training | 0.3573 | 0.550 | 0.0765 | 0.481 | 0.481 | 0.0765 | 0.5693 |
| Both females, same training, older candidate has more experience | 0.7942 | 0.373 | 0.1141 | 0.446 | 0.263 | 0.1141 | 0.3813 |
| Both females, older person has more experience and recent training | 1.3202 | 0.251 | 0.1471 | 0.349 | 0.200 | 0.1471 | 0.2587 |
| ***Younger male, older female, same*** | ***8.8651*** | ***0.003*** | ***0.3812*** | ***0.020*** | ***0.020*** | ***0.3812*** | ***0.0034*** |

| **Variables compared with treatment variable (Electrician vs. Managing Director)** | **Pearson chi2** | **P-value** | **Cramer's V** | **Fisher exact test** | | **Kendall's Tau-b** | |
|---|---|---|---|---|---|---|---|
| | | | | **2-sided** | **1-sided** | **Statistics value** | **P-value** |
| ***experience and training*** | | | | | | | |
| ***Younger male, older female, same training, older candidate has more experience*** | ***3.9937*** | ***0.046*** | ***0.2559*** | ***0.056*** | ***0.043*** | ***0.2559*** | ***0.0485*** |
| Older male, younger female, older person has more experience and recent training | 0.5604 | 0.454 | 0.0958 | 0.658 | 0.371 | 0.0958 | 0.4667 |
| Younger male, older female, same experience and training | 0.9099 | 0.340 | 0.1221 | 0.386 | 0.289 | 0.1221 | 0.3515 |
| ***Older male, younger female, same training, older candidate has more experience*** | ***3.4574*** | ***0.063*** | ***0.2381*** | ***0.100*** | ***0.057*** | ***0.2381*** | ***0.0665*** |
| Older male, younger female, older person has more experience and recent training | 0.3963 | 0.529 | 0.0806 | 0.615 | 0.418 | 0.0806 | 0.5432 |

**Table 48 — Results of Chi-square, Cramer V, Fisher exact and Kendall's Tau-b tests to test Hypothesis 1 and 2 (treatment group)**

| Variables compared with treatment variable (Electrician vs. Managing Director) | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| ***Both males, same experience and training*** | ***6.3953*** | ***0.011*** | ***0.3265*** | ***0.036*** | ***0.036*** | ***0.3265*** | ***0.0129*** |
| Both males, same training, older candidate has more experience | 0.6061 | 0.436 | 0.1005 | 0.604 | 0.302 | 0.1005 | 0.4452 |
| ***Both males, older person has more experience and recent training*** | ***4.0994*** | ***0.043*** | ***0.2614*** | ***0.078*** | ***0.078*** | ***0.2614*** | ***0.0466*** |
| ***Both females, same experience and training*** | ***4.0678*** | ***0.044*** | ***0.2604*** | ***0.200*** | ***0.200*** | ***0.2604*** | ***0.0502*** |
| Both females, same training, older candidate has more experience | 1.1871 | 0.276 | 0.1407 | 0.298 | 0.206 | 0.1407 | 0.2839 |
| Both females, older person has more experience and recent training | 1.2406 | 0.265 | 0.1438 | 0.384 | 0.205 | 0.1438 | 0.2736 |
| Younger male, older female, same experience and training | No statistics possible to calculate as for Electrician everyone chose younger person | | | | | | |
| Younger male, older female, same training, older candidate has more experience | 2.0332 | 0.154 | 0.1841 | 0.194 | 0.137 | 0.1841 | 0.1607 |
| Older male, younger female, older person has more experience and recent training | 0.5990 | 0.439 | 0.0999 | 0.583 | 0.424 | 0.0999 | 0.4546 |

| Variables compared with treatment variable (Electrician vs. Managing Director) | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| ***Younger male, older female, same experience and training*** | ***4.6671*** | ***0.031*** | ***0.2789*** | ***0.054*** | ***0.040*** | ***0.2789*** | ***0.0332*** |
| Older male, younger female, same training, older candidate has more experience | 1.4400 | 0.230 | 0.1549 | 0.250 | 0.207 | 0.1549 | 0.2393 |
| Older male, younger female, older person has more experience and recent training | 2.3151 | 0.128 | 0.1964 | 0.247 | 0.247 | 0.1964 | 0.1403 |

**Table 49 — Results of Chi-square, Cramer V, Fisher exact and Kendall's Tau-b tests to test Hypothesis 3 (control group)**

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | Kendall's Tau-b | |
|---|---|---|---|---|---|---|
| | | | | 2-sided | Statistics value | P-value |
| ***Electrician*** | | | | | | |
| **Males:** Only Age; Age + Experience; Age + Experience + Training | 62.0196 | 0.000 | 0.5870 | 0.000 | 0.5704 | 0.000 |
| **Females:** Only Age; Age + Experience; Age + Experience + Training | 52.5039 | 0.000 | 0.5401 | 0.000 | 0.4629 | 0.000 |
| **Younger** | 48.4166 | 0.000 | 0.5186 | 0.000 | 0.4515 | 0.000 |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | Kendall's Tau-b | |
|---|---|---|---|---|---|---|
| | | | | 2-sided | Statistics value | P-value |
| **males; Older females**: Only Age; Age + Experience; Age + Experience + Training | | | | | | |
| **Older males; younger females**: Only Age; Age + Experience; Age + Experience + Training | 56.2116 | 0.000 | 0.5588 | 0.000 | 0.4573 | 0.000 |
| ***Managing Director*** | | | | | | |
| **Males:** Only Age; Age + Experience; Age + Experience + Training | 57.5084 | 0.000 | 0.5652 | 0.000 | 0.5302 | 0.000 |
| **Females:** Only Age; Age + Experience; Age + Experience + Training | 36.0623 | 0.000 | 0.5652 | 0.000 | 0.4685 | 0.000 |
| **Younger males; Older females**: Only Age; Age + Experience; Age + Experience + Training | 89.4171 | 0.000 | 0.7048 | 0.000 | 0.5805 | 0.000 |
| **Older males; younger females:** Only Age; Age + | 84.7636 | 0.000 | 0.6862 | 0.000 | 0.5698 | 0.000 |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | Kendall's Tau-b | |
|---|---|---|---|---|---|---|
| | | | | 2-sided | Statistics value | P-value |
| Experience; Age + Experience + Training | | | | | | |

**Table 50 — Results of Chi-square, Cramer V, Fisher exact and Kendall's Tau-b tests to test Hypothesis 3 (treatment group)**

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | Kendall's Tau-b | |
|---|---|---|---|---|---|---|
| | | | | | Statistics value | P-value |
| ***Electrician*** | | | | | | |
| **Males:** Only Age; Age + Experience; Age + Experience + Training | 68.8345 | 0.000 | 0.6133 | 0.000 | 0.5405 | 0.000 |
| **Females:** Only Age; Age + Experience; Age + Experience + Training | 47.0092 | 0.000 | 0.5068 | 0.000 | 0.4474 | 0.000 |
| **Younger males; Older females**: Only Age; Age + Experience; Age + Experience + Training | 42.4095 | 0.000 | 0.4814 | 0.000 | 0.4853 | 0.000 |
| **Older males; younger females**: Only Age; Age + Experience; Age + Experience | 46.6471 | 0.000 | 0.5049 | 0.000 | 0.4926 | 0.000 |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | Kendall's Tau-b | |
|---|---|---|---|---|---|---|
| | | | | | Statistics value | P-value |
| + Training | | | | | | |
| ***Managing Director*** | | | | | | |
| **Males:** Only Age; Age + Experience; Age + Experience + Training | 58.9730 | 0.000 | 0.5677 | 0.000 | 0.5287 | 0.000 |
| **Females:** Only Age; Age + Experience; Age + Experience + Training | 45.2879 | 0.000 | 0.4975 | 0.000 | 0.3978 | 0.000 |
| **Younger males; Older females**: Only Age; Age + Experience; Age + Experience + Training | 70.4720 | 0.000 | 0.6206 | 0.000 | 0.6506 | 0.000 |
| **Older males; younger females:** Only Age; Age + Experience; Age + Experience + Training | 67.7338 | 0.000 | 0.6084 | 0.000 | 0.6185 | 0.000 |

**Table 51 — Results of Chi-square, Cramer V, Fisher exact and Kendall's Tau-b tests to test Hypothesis 4**

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| ***Electrician*** | | | | | | | |
| Both males, | 0.1697 | 0.680 | 0.0374 | 0.717 | 0.491 | 0.0374 | 0.6863 |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| same experience and training | | | | | | | |
| Both males, same training, older candidate has more experience | 0.0786 | 0.779 | 0.0255 | 0.856 | 0.461 | 0.0255 | 0.7825 |
| Both males, older person has more experience and recent training | 0.0713 | 0.789 | -0.0243 | 0.830 | 0.480 | -0.0243 | 0.7930 |
| Both females, same experience and training | 1.8263 | 0.177 | -0.1229 | 0.365 | 0.187 | -0.1229 | 0.1808 |
| Both females, same training, older candidate has more experience | 0.6804 | 0.409 | 0.0750 | 0.468 | 0.260 | 0.0750 | 0.4131 |
| Both females, older person has more experience and recent training | 0.6729 | 0.412 | -0.0746 | 0.457 | 0.263 | -0.0746 | 0.4157 |
| ***Younger male, older female, same experience and training*** | ***5.1300*** | ***0.024*** | ***-0.2059*** | ***0.057*** | ***0.030*** | ***-0.2059*** | ***0.0246*** |
| Younger male, older | 1.3977 | 0.237 | -0.1075 | 0.303 | 0.165 | -0.1075 | 0.2404 |

| **Variables compared with treatment variable** | **Pearson chi2** | **P-value** | **Cramer's V** | **Fisher exact test** | | **Kendall's Tau-b** | |
|---|---|---|---|---|---|---|---|
| | | | | **2-sided** | **1-sided** | **Statistics value** | **P-value** |
| female, same training, older candidate has more experience | | | | | | | |
| Younger male, older female, older person has more experience and recent training | 1.0020 | 0.317 | -0.0910 | 0.357 | 0.207 | -0.0910 | 0.3203 |
| ***Older male, younger female, same experience and training*** | ***2.8053*** | ***0.094*** | ***0.1523*** | ***0.109*** | ***0.070*** | ***0.1523*** | ***0.0960*** |
| ***Older male, younger female, same training, older candidate has more experience*** | ***5.0064*** | ***0.025*** | ***0.2034*** | ***0.037*** | ***0.021*** | ***0.2034*** | ***0.0261*** |
| ***Older male, younger female, older person has more experience and recent training*** | ***4.4587*** | ***0.035*** | ***0.1920*** | ***0.058*** | ***0.031*** | ***0.1920*** | ***0.0359*** |
| ***Managing Director*** | | | | | | | |
| Both males, same experience and training | 0.2403 | 0.624 | 0.0446 | 0.663 | 0.394 | 0.0446 | 0.6280 |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| Both males, same training, older candidate has more experience | 0.2036 | 0.652 | 0.0410 | 0.717 | 0.394 | 0.0410 | 0.6554 |
| Both males, older person has more experience and recent training | 0.3343 | 0.563 | 0.0526 | 0.762 | 0.393 | 0.0526 | 0.5682 |
| Both females, same experience and training | 0.5803 | 0.446 | 0.0693 | 0.481 | 0.301 | 0.0693 | 0.4504 |
| Both females, same training, older candidate has more experience | 2.4343 | 0.119 | 0.1418 | 0.145 | 0.084 | 0.1418 | 0.1210 |
| Both females, older person has more experience and recent training | 0.2179 | 0.641 | -0.0424 | 0.684 | 0.397 | -0.0424 | 0.6445 |
| Younger male, older female, same experience and training | 0.2513 | 0.616 | -0.0456 | 0.789 | 0.409 | -0.0456 | 0.6208 |
| ***Younger male, older female, same training, older*** | ***7.1199*** | ***0.008*** | ***0.2426*** | ***0.010*** | ***0.006*** | ***0.2426*** | ***0.0079*** |

| Variables compared with treatment variable | Pearson chi2 | P-value | Cramer's V | Fisher exact test | | Kendall's Tau-b | |
|---|---|---|---|---|---|---|---|
| | | | | 2-sided | 1-sided | Statistics value | P-value |
| ***candidate has more experience*** | | | | | | | |
| Younger male, older female, older person has more experience and recent training | 1.0275 | 0.311 | 0.0922 | 0.491 | 0.254 | 0.0922 | 0.3155 |
| Older male, younger female, same experience and training | 0.0014 | 0.970 | 0.0035 | 1.000 | 0.586 | 0.0035 | 0.9732 |
| ***Older male, younger female, same training, older candidate has more experience*** | ***3.4920*** | ***0.062*** | ***0.1699*** | ***0.082*** | ***0.047*** | ***0.1699*** | ***0.062*** |
| Older male, younger female, older person has more experience and recent training | 0.8463 | 0.358 | 0.0836 | 0.529 | 0.274 | 0.0836 | 0.3623 |