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Does heterogeneity in contract-type and employment sector matter?

An analysis of transitions of the temporarily employed in Norway

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Executive summary

Over the past few decades, temporary contracts have become increasingly important in determining career trajectories of individuals. For some, it has worked as a bridge to permanent employment, while for others, it has led individuals to be stuck in a cycle of unemployment and temporary employment (Booth et al., 2002; Gash, 2008). A possible explanation for this is that temporary employees are a heterogenous group for whom temporary contracts vary from one individual to the other (Berglund et al., 2017; Fuller & Stecy-Hildebrandt, 2015; Rasmussen et al., 2019). Hence, with this thesis, we address this heterogeneity and study transitions of temporarily employed in Norway using data from the Norwegian Labour Force Survey between 2006 until 2018. Using linear probability model for our analysis, temporary employees are assessed as a heterogenous group whose probabilities of transitioning to permanent employment, unemployment and remaining in temporary employment differ within the group depending on the reason for temporary contract and sector of employment. Our findings depict that for temporary employees on probationary contract, the temporary employment contract acts as stepping stone into permanent employment. Furthermore, temporary employees in the public sector are less likely to transition to permanent employment and more likely to remain temporarily employed relative to the private sector after a little over two years and, hence, our results indicate that temporary employment is more persistent in the public sector. Furthermore, using data from Statistics Norway for years 2006-2020, we studied the impact of 2015 policy change, where the maximum length of a temporary contract was extended to 12 months in the private and municipality sector, on the use of temporary contracts in Norway. We found that, on aggregate level, the policy change had no effect on the use of temporary contracts in Norway. However, the effect on sub-groups differed as for interns, the policy change led to an increased use of temporary contracts, but seasonal work remained unchanged.

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1. Introduction

Temporary employment is a current topic, and it affects a larger number of workers each year as the job stability is decreasing. When predicting future of work, OECD (2019) predicts that job mobility in general will increase in the coming years as the role of lifetime employment will decrease, and transitions between different work contracts and in and out of employment will increase. Even though job tenure is decreasing, transitions to employment have increased. Therefore, people are more and more transitioning between jobs than to unemployment. Hence, researching temporary employment is of growing importance in the European and Norwegian context.

Furthermore, studying the transitions of temporarily employed is essential since many struggle to transitions from temporary to permanent employment. When looking at transitions in the EU, on average, less than 50% of the temporary employees in a given year had gotten a permanent full-time contract three years after (OECD, 2014, p. 182). Hence, it is vital to study where the temporary employment leads the individuals; whether they manage to transition to permanent employment or get stuck on temporary employment. If an employee does not transition to permanent employment, they may end up being trapped in a cycle of repeated temporary contracts, or transition to unemployment or altogether outside of labour force (Gash, 2008). From the perspective of the temporarily employed, temporary employment can work in their favour or against them. There are two main career trajectories temporary employment can lead to: a stepping stone or an entrapment career trajectory. In a stepping stone career trajectory, one uses the temporary employment as a stepping to permanent employment, and in an entrapment career trajectory one ends up being trapped in temporary employment and the transitions happen between temporary employment and unemployment. Stepping stone career trajectory can also be referred to as temporary employment working as a bridge, and entrapment career trajectory as a trap (Booth et al., 2002; Gash, 2008).

From the employer perspective, temporary employment can serve for different purposes, and the contract type usually indicates the need for temporary labour. For employers, temporary contracts can serve as a screening device and as a probationary contract where the skills and abilities of an employee are assessed before offering an employee a permanent contract (Fuller & Stecy-Hildebrandt, 2015; Gash, 2008; Masui, 2020). On the contrary, a considerable portion

of employers use temporary contracts for gaining flexibility and liberty to adjust the size of the work force based on demand and economic fluctuations. As such, employers use temporary employment to respond to short-term vacancies, seasonal fluctuations in product demand and to economic shocks and booms (Gash, 2008; Masui, 2020).

Based on the contract type, temporary employees should have different transition probabilities to permanent employment, temporary employment, and unemployment. It was confirmed in Sweden that temporary employees with probation contracts have a higher likelihood of transitioning to permanent employment, while the ones with more seasonal or project-based contracts had a lower likelihood of transitioning to permanent employment when compared with substitute workers (Berglund et al., 2017). Thus, in this thesis we will study the effect of the contract type on the labour market outcomes of temporary employees in Norway as the contract type that a temporary employee has, should have on effect on their transitions to different labour market outcomes as the employers' need for labour is different in different contract types. This is a novel approach as previous research has mainly focused on treating the temporarily employed as one group and only recently the research has shifted the focus on the heterogeneity of the temporarily employed (Berglund et al., 2017; Fauser, 2020; Fuller & Stecy-Hildebrandt, 2015; Mattijssen & Pavlopoulos, 2019; McVicar et al., 2019; Rasmussen et al., 2019; Reichenberg & Berglund, 2019).

Overall, as temporary employment is a current and ever-increasing phenomenon, our thesis will give input for the political discussion on the topic and put emphasis on that the heterogeneity of temporary employment as a phenomenon should be accounted for as temporary employment can have different end results for different people. Besides the transitions of the individuals, we will also look into the legislation of the temporarily employed in Norway, how it was changed in 2015 and whether the legislative change had an effect on the level of use of temporary employment in Norway.

This thesis is structured in the following manner. In the coming sections, "Literature Review" starts off with a background on temporary employment in the EU and Nordics, followed by an overview of empirical research of temporary employment in the Nordics, international research focusing on the career trajectories of the temporarily employed and the heterogeneity of the group, research on temporary employment in the public sector, and labour market

policies on temporary employment and a legislative change on temporary employment in Norway. After that “Research question and hypothesis” will be presented. Then, the section “Data” will describe the data used in this thesis as well as provide summary statistics for the sample of interest. “Methodology” will explain the empirical model used along with a description of the variables of interest. “Results” presents an analysis of the findings and links the findings to the existing literature. “Limitations” talks about the scope of further research in the light of the limitations of the study. Lastly, “Discussion and conclusion” discusses and concludes the study and the findings.

2. Literature review

2.1 Temporary employment in the EU and in the Nordics

In European Union, temporary employment is a common phenomenon. Temporary contracts cover 12.1% of total employment in 2018, and the use of temporary contracts has increased by 0.6 percentage points compared to the 2013 level. Temporary work is not always optimal from the employee perspective as more than 50% of temporary employees work in temporary employment involuntarily, but the rate is lower for young employees (aged 15-24), where 29.9% work in temporary positions involuntarily (European Commission, 2019, p. 35). Additionally, there are differences on who ends up temporarily employed in Europe. Especially, high proportion of young workers, low-skilled workers and migrant workers are hired with temporary contracts, and the use of temporary contracts is high in the low- and medium-skilled service sector (Eichhorst et al., 2018).

Figure 1 below presents the level of temporary employment in the Nordics, where Norway has the lowest levels of temporarily employed people with 8.4 percent in 2019 and Denmark had the second lowest share with 10.8 percent. The EU average was 15.1 percent, and Finland and Sweden had similar levels of temporarily employed people with 15.2 and 15.7 percent respectively. The share of temporarily employed has slightly decreased in Norway in the past decade as in 2006 the share was 13.3 percent, which decreased to 8.6 in 2019. This slightly decreasing trend is also evident in the EU countries in general and in Finland and Sweden. However, in Denmark, the trend is the opposite as there is a slight increase in the share of temporary employment. In all Nordic countries, there is more women than men temporarily employed. In Norway in specific, there are 10.0% women and 7.4% men temporarily employed in 2019 (Eurostat, 2021). Overall, the trend in temporary employment in Norway has been decreasing in the past two decades. In the middle of the 90s, around 13% were employed temporarily in Norway. This decreased to around 10% towards the end of the 90s and stayed there until after the Great Recession of 2008 when the share of temporary employees dropped to 8% and has stayed at those levels since that (Nergaard, 2017). In conclusion, the share of temporarily employed in Norway has been relatively stable but decreasing overall in the past 25 years, and there are more women than men temporarily employed.

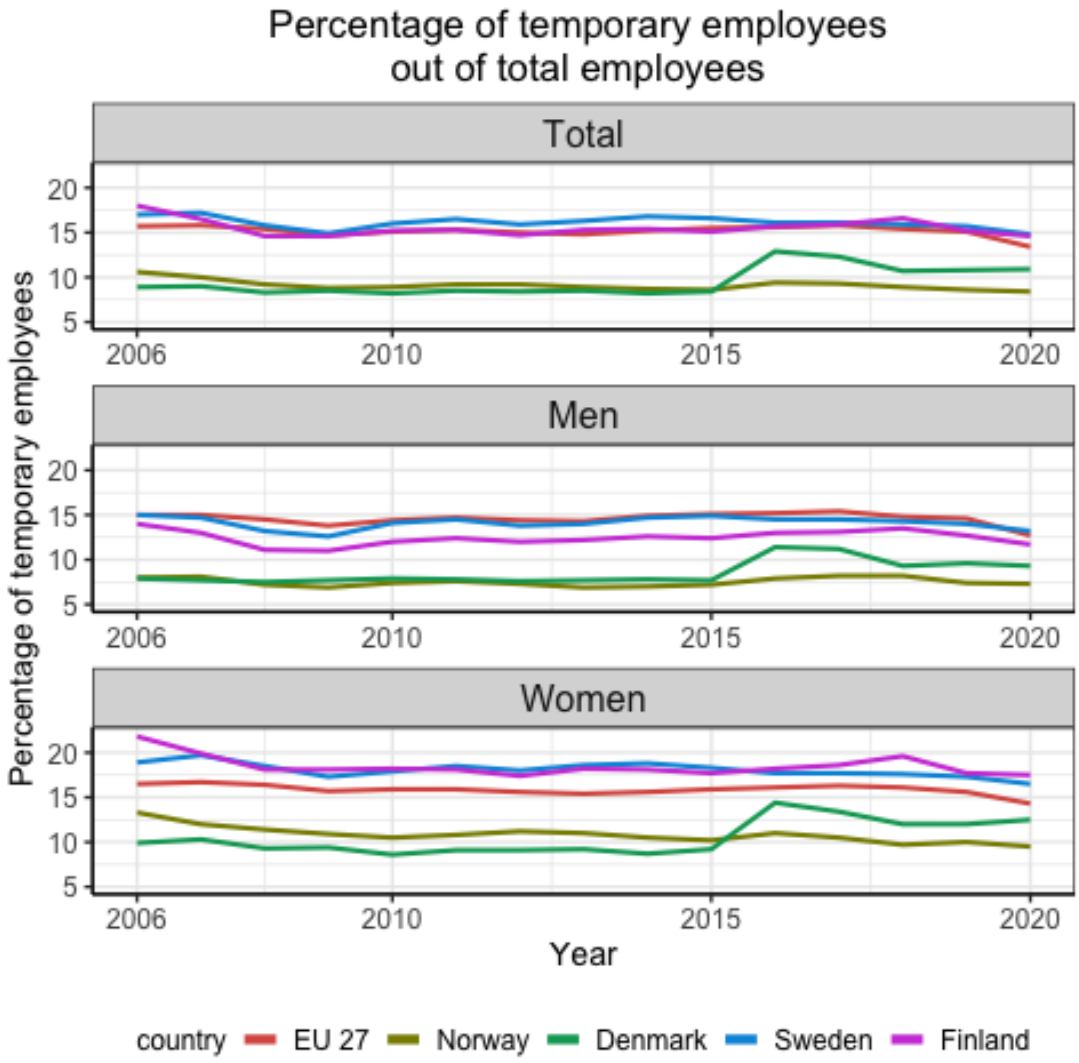

Figure 1 Percentage of temporary employees out of total employees aged 16 to 64 years, Eurostat (2020)

However, when looking at the temporary employment, one should not just look at the share of the contracts, but whether employees have taken this contract by choice or because of lack of other alternatives. Eichhorst et al. (2018) argue that temporary contracts are accepted when permanent jobs are not available. Figure 2 below presents Eurostat (2021) data showing involuntary temporary employment. The percentages show involuntary employment out of temporarily employed people in 2019. The EU average is 52.1% and Norway has a lower percentage of involuntary temporary employment with 45.9%. Denmark has even lower percentage of involuntary temporary employment (34.8%), and Sweden has a percentage slightly lower than the average (49.6%) and Finland the highest (66.8%). Overall, there is more women than men involuntarily temporarily employed in all Nordic countries and in the

EU on average. The ranking of the Nordic countries from highest to lowest based on involuntary temporary employment in each sex is the same as with the total percentages: Finland has the highest numbers, and Sweden, Norway and Denmark have lower than the EU average in the respective order. Hence, involuntary temporary employment is not as prominent in Norway as it is in the EU on average or in the neighbouring Sweden and Finland.

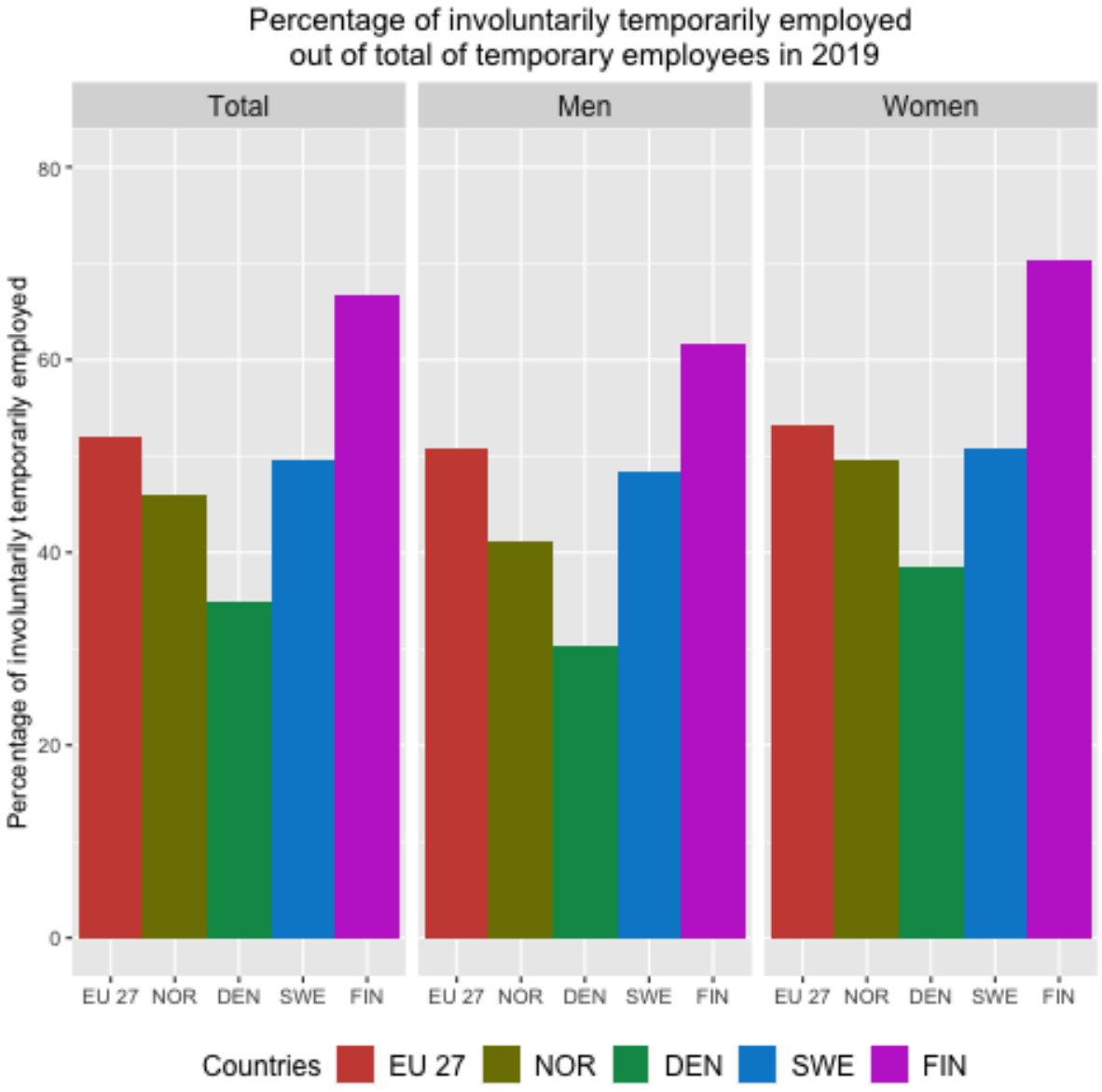

Figure 2 Involuntary temporary employment, percentage of temporary employees aged 15 to 64 years that could not find permanent job, Eurostat (2021)

Norway having lower use of temporary employment could be explained by the strict legislation in Norway. OECD's Employment Protection Legislation (EPL) indicator measures

the strictness of labour market regulation, and the index can be used to compare the state of the labour market and the strictness of policies in different countries. The scores range between 0 to 6; 0 representing the lowest regulatory protection and 6 the highest. Compared to other Nordic countries and the OECD average, Norway has stricter legislation in terms of temporary employment than the other countries. The OECD average for the index is 1.7, while Norway has a score of 2.6. Measured by the index, Denmark and Finland are close to the OECD average of 1.7 (both countries have a score of 1.6), but Sweden has the most flexible policies (score of 0.8) (OECD, 2020).

Even though temporary employment is not as widely used as in the EU countries, temporarily employment is still a prominent part of the Norwegian labour markets and the share of people temporarily employed has been relatively stable. Additionally, there are employees for whom the temporary employment is not by choice, but they are involuntarily temporarily employed, and this concern more women than men. Hence, it is important to study temporary employment in Norwegian context. Next, we will present how labour market transitions of temporarily employed have been studied.

2.2 Temporary employment and transitions

2.2.1 Transitions in the Nordic countries

Next, we will shed light on what type of phenomenon temporary employment is in the Nordic countries, how it has been studied and how people transition from temporary employment to other states. There are several researchers who have studied labour market transitions in the Nordic countries. Many focus their research on one or two countries, while there is some research that studies all the Nordic countries. One of those is by Rasmussen et al. (2019) who study the extent of job and income insecurity associated with temporary employment in the Nordic context. They focus on precariousness of non-standard employment contracts in Norway, Sweden, Denmark, and Finland covering years from 1995 until 2015. The study covers the evolution of four types of non-standard employment contracts: marginal part-time employment, fixed-term employment, temporary agency workers and self-employed workers.

In their comparative analysis, they find that fixed-term contracts have seen the highest growth in terms of use since 1990 in Sweden. In contrast, the proportion of employees on fixed-term contracts in Norway and Denmark have gone down over the years. Like the use of fixed-term contracts, the job and income insecurity for fixed-term employees is also lower in Norway and Denmark. Moreover, as of 2015, Denmark had the highest number of marginal part-time employees (individuals that work less than 15 hours per week) at 15% of the labour force in Denmark as opposed to 7% in Norway, 4% in Sweden and 3.5% in Finland. However, despite wide use of such contracts in Denmark and Norway, job and income security are not worse than for employees with full-time permanent contracts. Rather, marginal part-time workers in Denmark have reported better job security as opposed to employees with full-time permanent contracts, which is not the case in Norway, Sweden, and Finland. Moreover, in Norway, the level of job insecurity related to marginal part-time work stands at 3% as opposed to Denmark at less than 1%. However, the level of job insecurity in Sweden is thrice as much as Norway at 9% with Finland following close at 8%.

This study highlights that the labour market in Norway and Denmark has rather better mobility and job security for individuals having non-standard employment contracts as compared with their peers in Sweden and Finland. The most probable reason behind this situation is that the Danish and Norwegian labour market are relatively more open to shifting from non-standard employment to standard employment. Hence, based on the findings, individuals with temporary employment contracts in Norway do not necessarily fall in the entrapment career trajectory, but there is mobility from temporary positions and the stricter labour laws also provide temporary workers job security.

Another study that analyses four of the Nordic countries in one study is by Svalund (2013) who looks into the connection between employment protection legislation (EPL) and labour market mobility. Specifically, Svalund (2013) examines whether differences in EPL regulation in Norway, Denmark, Sweden and Finland affect transitions from unemployment, temporary employment to permanent employment and whether individuals on temporary employment continue to be in a stable labour market position through either temporary or permanent employment, or whether they slip into unemployment.

By using data between 2000 and 2006, he finds that there is persistence in unemployment as 21% of working age individuals that are unemployed in one period remain unemployed in the next period. However, 59% of the unemployed individuals, are employed a year later in Norway. and among those in prime age, only 1% of the individuals' transition from unemployment to employment irrespective of the kind of employment contracts they had previously. This level is much lower as compared to Denmark (6%), Finland (4%) and Sweden (3%). Moreover, in Norway, 94% of those permanently employed, still hold the same status one year later implying that job security of permanent positions is quite high as compared to other Nordic countries.

Turning to whether those in temporary employed have a higher probability of becoming unemployed after one year, this study finds that Norway has the lowest probability of transitioning from temporary employment to unemployment after one year, relative to Denmark, Sweden, and Finland. Additionally, the probability of those on temporary contracts to be employed on permanent contracts in a year is highest in Norway followed by Denmark, Sweden, and Finland.

Thus, this study highlights that rigid regulations for both temporary and permanent employment contracts in Norway could be a possible reason for high levels of transition rates from temporary to permanent employment. Moreover, the study also reiterates, through the case of Sweden, that having relaxed regulations for temporary employment, while having stringent regulations for permanent employment leads to a segmented labour market, where those unemployed often involuntarily accept secondary and temporary positions. On the other hand, in Denmark, where there are lax regulations for both temporary and permanent employment, there is the second highest probability out of the Nordic countries to transition from a temporary position both to unemployment and permanent position. Thus, transitions do happen in Denmark but, for a temporary employee, it can go both ways: they can gain a permanent position or loose the temporary one.

When looking into the situation in Sweden, Berglund et al. (2017) studied the progress of temporary contracts in Sweden and found that 40% of temporary employees manage to shift to permanent employment after two year whilst the remaining still continue to struggle with insecure employment. This large of proportion that transitioned to permanent employment

thus provides some evidence in favour of the stepping stone hypothesis, but as many continue to struggle, the stepping stone hypothesis does not include all temporarily employed people.

What is distinct about the study of Berglund et al. (2017) is that they do not just look at temporary employees as one group, but they treat them as a heterogeneous group and study how the transitions of different subgroups differ. By using data from the Swedish Labour Force Survey between the time frame of 1992-2010, the authors conduct multilevel binomial logistic regression for empirical findings. In this study, the authors differentiate between different types of temporary contracts. These different types of temporary contracts include substitute's, seasonal workers, on call employees, probationary employees and trainees. In order to differentiate the trajectory of different types of temporary contracts, the authors report the odds ratio of different types of employment contracts.

Having substitutes as reference category, many other forms of temporary employment such as seasonal workers, on call employees, project, holiday employees have lower odds of transitioning to permanent employment. On the other hand, probationary employees have higher odds of transitioning into permanent employment as compared with substitutes, where the odds ratio is twice as high for probationary employees. The authors thus suggest this lays evidence that probationary employment contracts work as a "screening" device for employers. Furthermore, the lower odds of transitioning for on call employees, seasonal workers highlight that the employers seek flexibility with these kinds of contracts and so the stepping stone hypothesis does not hold for these types of employment contracts. Thus, the type of the temporary contract is a significant predictor of the probability of transition from temporary to permanent employment as the contract type indicates the employers' motivation and need for the worker – whether the temporary employment is used as screening or the work is seasonal by nature and that is why the temporary contract is used.

Other factors besides the contract type matter as well in transitioning to a permanent contract in Sweden. Berglund et al. (2017) find that education has a positive relationship with the transition probability. Individuals with just primary education have lower odds of transitioning to permanent employment relative to those with tertiary education. Moreover, employees who work part-time have lower odds of transitioning as opposed to those employed full-time. Additionally, the sector in which the employees work also affects the transition probabilities.

Their findings suggest that employees in the public sector have lower odds of transitioning to permanent employment as compared to the private sector. In contrast the odds of employees in the public sector to become unemployed or out of the labour force are also low. So, even though the transitioning to permanent employment is less likely in the public sector, the authors' findings suggest that temporary employment in the public sector is quite secure. Lastly, the authors find that macroeconomic factors such as unemployment have a negative and significant relationship with the transitions meaning that the higher the unemployment the lower the odds are for transitioning from temporary to permanent employment.

Finally, we would like to present two studies on transitions specifically in the Norwegian context. Firstly, transitions of temporarily employed people have been studied by Engebretsen et al. (2012) in Norway. They study the transitions from temporary, permanent and unemployment to permanent employment in Norway. They use the Labour Force Survey (AKU) for the years 1996-2005. Specifically, they study the springboard effect in Norway as they try to find out whether temporary employment increases the likelihood of transitioning to permanent employment compared with unemployed people. Springboard and stepping stone effects have been treated as a synonyms (Booth et al., 2002), but in the recent literature the two concepts have been separated by stepping stone meaning when a temporary employee gets a permanent position after a longer period of temporary employment, but in springboard the effect is faster and temporary employment is upgraded after a short time period to permanent employment (Reichenberg & Berglund, 2019).

Engebretsen et al. (2012) find that indeed that the ones with temporary contracts have a higher likelihood of getting permanent contracts compared with unemployed people: after one quarter, the relative likelihood of a temporarily employed person to have a permanent position compared with unemployed person is 2.9 percentage points and after four quarters it is 4.2. Hence, they find evidence of temporary contracts working as springboards in Norway. Additionally, they compare whether the springboard effect is different with different types of employees, and they find that the ones with the lowest educational level (basic education, ungdomskole) benefit from the temporary employment as the ones with temporary contract have a higher relative likelihood of 7.7 percentage points to transition to a permanent contract than unemployed people after one quarter and a relative likelihood of 16.0 percentage points after four quarters. Thus, the springboard effect strengthens over time for the ones having the

lowest educational level. When it comes to age, the springboard effect is found with people over 30 years. The ones over 30 with temporary contracts have a higher relative likelihood of 5.7 percentage points to transition to a permanent position than the ones who are unemployed. This effect is found after one quarter, and the effect increases over time as after four quarters the effect is 7.8 percentage points. With under 30-year-olds, the springboard effect is not found when comparing the transitioning of temporarily employed and unemployed people to a permanent contract. With gender, the springboard effect was found with men and not with women, but the difference between genders was not statistically significant.

Second study that studies the transitions in the Norwegian context is by Svalund and Nielsen (2017). Their focus is to study whether temporary employment contracts can act as a stepping stone to permanent employment relative to permanent employment and unemployment and, like Engebretsen et al. (2012), they also use the Labour Force Survey (AKU) dataset. In addition, they combine the AKU dataset with Norwegian registry data. Their range in the data covers the periods of 2000 and 2009. Their model has labour market status as the primary independent variable and the analysis includes investigating whether the individuals on temporary employment gain stable, secure and permanent employment four years later. The model controls for age, education level, and gender. The analysis compares individuals with different types of temporary employment contracts for example individuals who works as substitutes, extra-help, project employee, probationary employee relative to unemployed and permanent employees.

The results show that, 45.5% of temporary employees do not have a stable employment after 4 years as compared to 25% of permanently employed and 63% unemployed individuals. Thus, employees on temporary contracts do have better pathway to be integrated to the labour market relative to unemployed individuals. However, there are still large differences between temporary and permanent employees in Norway.

Moreover, what this study finds, as previously found by Engebretsen et al. (2012), in Norway, young individuals on temporary employment contracts do not benefit from being temporarily employed relative to others. Thus, the stepping stone effect is the weakest for the young (20-24 years old) and highest for middle-aged people (40-49 years). However, contrary to Engebretsen et al. (2012), individuals with lowest levels of education do not have any better

chances of transitioning from temporary employment to permanent employment relative to others and rather have high chances for being out of the labour force or education system. Thus, this study shows that temporary employment does not provide the desired stepping stone effect to stable employment for young and low educated individuals as compared with other groups in Norway.

Moreover, the study also highlights the difference in transitions between men and women. The type of contract does matter for men as chances of transition to stable employment are better for men who work as project employees or substitutes as opposed to being extra help or unemployed. The opposite is true for women, the type of temporary contract does not matter, and that women have better chances of stable employment if they had been on a temporary contract as compared to being unemployed.

Overall, in comparison with the other Nordic countries, for the temporary employees, Norway is a relatively good country to work in. In Norway the risk of marginalization of temporary employees is low when compared with Sweden (Svalund & Berglund, 2018), Norway has better mobility, and higher income and job security for individuals with non-standard employment contracts as compared with Sweden and Finland (Rasmussen et al., 2019), and Norway has the lowest probability of transitioning from temporary employment to unemployment and the highest of probability of transitioning to permanent employment (Svalund, 2013).

When looking at the transitions from temporary employment in Norway, employees on temporary contracts are more likely to transition to permanent employment than unemployed (Engebretsen et al., 2012; Svalund & Nielsen, 2017). Hence, temporary employment has worked as a bridge to permanent employment in Norway. However, in this thesis we will investigate in more detail for whom does the temporary employment work as a bridge. Similar to the novel approach by Berglund et al. (2017), we will treat the temporary employees as a heterogenous group and try to look into who benefits from the temporary employment and who does not by looking into different subgroups of temporarily employed.

2.2.2 Transitions in the public sector

It is important to distinguish between the public and the private sector as the type of work performed in the sectors is different, the labour laws in the two are different and the type of employees hired have different characteristics. All of this can have an effect on the transitions of the temporary employees.

Fontaine et al. (2020) have performed a comparative analysis of the public sector in different countries as they compare public sector in France, Spain, UK and the US. Studying public sector is special as public sector hires a large proportion of women, college graduates and older employees. For example, they find that in France and the UK, public sector accounts for around 30 percent of the total employment of women and in Spain and the US for around 20 percent. Additionally, 20 to 40 percent of college graduates are hired in the public sector and, hence, public sector is an important employer for young, educated people. Public sector is also important employer for the older employees as in France and the UK public sector accounts for 25 percent of the employment of the older employees, whereas in Spain and the US the fraction is 22 percent. Moreover, they find that relative to the private sector, there is 30 to 50 percent less turnover in the public sector and that employees do not transition between the sectors.

When studying temporary employment in the public sector and the effect of temporary employment on career transitions and wages, Stecy-Hildebrandt et al. (2019) find that in Canada, where the majority of the public sector workers are females, the ones starting with temporary employment in public sector have lower earnings even after five years than the ones initially permanently employed. Contrast to the private sector, where there is an initial earnings gap between temporarily and permanently employed, the earnings however converge after three years. They find that this difference may be due to temporary employment being persistent in the public sector. They find that similar to Fontaine et al. (2020), public sector employees stay in the public sector and do not transfer to private, and a larger proportion of the initially temporarily employed are still temporarily employed in the public sector than in the private after five years. In Sweden, Berglund et al. (2017) found similar results: temporary employees working in the public sector had lower likelihood of transitioning to permanent

employment but they are less likely to transition to unemployment than their private sector counterparts. Thus, temporary employment seems persistent in the public sector.

Hence, it is important to study the transitions of temporarily employed also from the perspective of the public sector as there are differences in the transitions and earnings between the sectors. As the Figure 3 below presents, out of the employed people in Norway, more women than men work in the public sector. Between the years 2011 and 2020, around one third of the total number of employed people work in the public sector. However, there is large differences between the male and female employees as public sector is a more typical employer for women. Close to every second employed women in Norway works in the public sector, whereas not even every fifth employed men works there (Statistics Norway, 2021c). Hence, the proportion of the employed women in the public sector is even higher in Norway than Fontaine et al. (2020) found in their country comparisons.

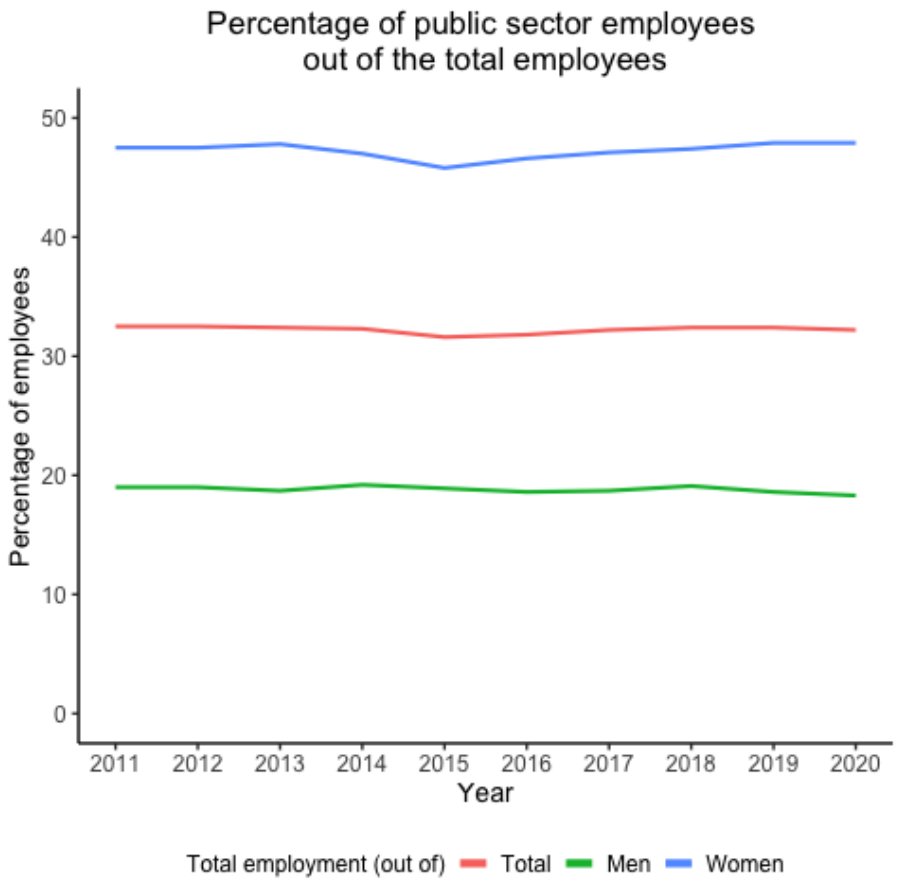

Figure 3 Percentage of public sector employees out of the total employees, modified from Statistics Norway (2021c)

The proportion of gender differences in the sectors is thus vast, and, hence, if there are differences in the use of temporary employment and transitions from temporary to permanent contracts between the public and private sectors, these differences may indicate that the Norwegian labour market treats employees based on gender differently as there is a larger proportion of females working in the public sector and men in the private sector.

2.2.3 Heterogeneity of the career trajectories

There are several researchers who have moved from studying transitions between two time-points to studying sequences of career transitions (Fauser, 2020; Fuller & Stecy-Hildebrandt, 2015; Mattijssen & Pavlopoulos, 2019; McVicar et al., 2019; Reichenberg & Berglund, 2019). As transitions in the labour market are not a one-time thing in one's career, but people transition between different states, by studying sequences of career trajectories and transitions, the researchers manage to better capture this multifaceted phenomenon. Even though in the thesis itself, we will look at the transitions temporarily employed within two years and not a sequence of transitions, it is still relevant to look into how in the past years sequence analysis is gaining importance in research of career trajectories and temporary employment. Studies in different countries have been able to show how complex phenomena transitions in the labour market are: often people have several different transitions and they may transition between several different states. Hence, people do not just transition between employment and unemployment or between temporary and permanent contract once, but they can go through different states or transition back and forth between two states in the given timeframe. Temporarily employed are a heterogeneous group, and some temporarily employed benefit from their temporary employment and transition to permanent employment (stepping stone trajectory), while others are in the entrapment career trajectory and face transitions between temporary employment and unemployment.

The groundbreaking study in the sequence analysis of career trajectories was conducted by Fuller and Stecy-Hildebrandt (2015) in Canada. By matching a representative sample of temporary employees with a sample of permanently employed they find that both temporary and permanent employees experience volatility in their employment relationships over the five years, but the volatility is higher for temporarily employed. Temporary employees are on average employed 84.4% of the time whereas permanent employees are 91.6% of the time.

However, Canada being a liberal market economy, not even permanent employment is as stable as one would think. The permanent employees also have changes in their employment status and only less than half (46.7%) were continuously employed in permanent jobs over the five-year period.

Fuller and Stecy-Hildebrandt (2015) find both evidence of stepping stone argument where temporary employment works as a screening method and leads to permanent employment, and of entrapment argument where temporary employment can lead to a vicious cycle where an employee is stuck between temporary employment, unemployment or even exiting the labour market. Transition to permanent full-time employment is the most prominent for initially temporarily employed as 39% of the temporarily employed do that. These are the type of temporarily employed who initially and after the five years have the highest income. The second most common pattern is churning, which covers 17% of the temporarily employed and where the transitions between jobs and unemployment are volatile. The volatility is the highest with this group, and people seem to find it difficult to settle into a stable employment. Additionally, exit from the labour force is relatively common as 9.3% of temporarily employed exit the labour market after at least one period of unemployment implying that the exit is not voluntary, but one exits the labour market after not succeeding in landing a job.

When studying the career trajectories of temporarily employed people in the Netherlands with sequence analysis within an eight-year period, Mattijssen and Pavlopoulos (2019) find in total 17 different career clusters within the temporarily employed. Hence, temporary employment can lead to a variety of different career trajectories, where some have high employment security and others do not, and some have high income security and others do not. Similar to previous research presented, they find that 30% of the career trajectories can be classified as stepping stones and 40% as traps, there was 25% of the careers that do not fit into neither of the categories as these careers combine high income security with low employment security, or the other way around. Thus, there is more variety in temporary employment than generally considered.

Similar results are found Germany and in Australia. Fauser (2020) in Germany finds career trajectories of both the stepping stone (18%) and entrapment (10%) types. In the stepping stone career trajectory, employees are initially employed in full-time temporary positions and within

one to two years transition to full-time permanent position. In entrapment career trajectory, individuals spend most of their career in full-time temporary employment with interruptions of unemployment. McVicar et al. (2019) in Australia find both evidence for temporary employment working for some as a bridge or for some as a trap. Additionally, they find that women and lowly educated are more likely to end up in a situation where temporary employment works as a trap instead of a bridge. Hence, temporarily employed are a heterogenous group, and the transitions can work in their favour or against them, depending on their characteristics and the career trajectory they are on.

The career trajectory the temporarily employed is on also has an effect on their wages. In Germany, there is a wage penalty for the temporarily employed in the stepping stone or entrapment career trajectory, and the wage penalty is higher for the ones in entrapment career trajectory. Additionally, in terms of wage cumulation, temporary employment works as a disadvantage for both the ones in stepping stone and entrapment career trajectory compared with permanently employed (Fauser, 2020). Skedinger (2018) finds in Sweden that out of temporarily employed, the ones on probation contract do not face a negative wage premium compared to permanent employees, whereas the ones in seasonal or project work have a negative wage premium of 3–4%. This is consistent with how and why the different contract types are used as the probation contract should lead to permanent employment and, hence, the original wage should be at similar levels than being permanently employed, whereas with seasonal and project work the wages offered may differ from permanent employment as the nature of the work differs. Furthermore, Reichenberg and Berglund (2019) differentiate the temporarily employed based on their career trajectories and find that the ones in entrapment trajectory who transition between unemployment and temporary employment earn 44.5% less than the employees who stay in temporary employment, while there is earnings premium for the ones in springboard (43.4%) or stepping stone (34.6%) career trajectory compared with the ones staying in temporary employment. Hence, there is two sides of temporary employment and depending on the sequence one has, one can either benefit or suffer from it in terms of earnings.

Furthermore, Mattijssen and Pavlopoulos (2019) question the idea of permanent contract being the only good end-state in one's career trajectory for multiple reasons. Firstly, both Reichenberg and Berglund (2019) in Sweden, and Mattijssen and Pavlopoulos (2019) in the

Netherlands found a sequence that transitioned from permanent to temporary employment as these employees had higher earnings in temporary employment, and the researchers assume that these are employees who work in the field where there is a shortage of skilled labour, and they can benefit from the high demand for their skill, such as doctors, lawyers, or engineers. Secondly, permanent employment does not guarantee high employment security as they find a group who transitioned from permanent to temporary employment and had a period of unemployment in-between indicating that the transition was not by choice. Thirdly, low pay can be related with permanent employment as they find a group (13% of the sample) where individuals quickly entered permanent employment but maintained relatively low wages. Because employment and income security can be low even in permanent employment, it should not be merely considered as an end-state that is always optimal for the individual, but the heterogeneity of permanent and temporary employment in terms of employment and income security should be accounted for.

In conclusion, the benefit of sequence analysis is that it shows that career trajectories do not consist of one transition to the optimal end-state, but there are multiple transitions between different states, and these studies clearly show that as they have been able to track the transitions for a longer timeframe – most of them for at least five years or longer. Overall, the sequence analysis conducted in different countries show that temporary employment is a more complex phenomenon than often considered. Temporary employees are a heterogeneous group, not one group where all employees with a temporary contract can be grouped into. For some, temporary employment works as a stepping stone to permanent employment, and, for some, temporary employment works as a trap of consistent temporary contracts or periods of unemployment in between the contracts. The type of temporary contract one has (probation, on-call, seasonal work etc.) as well as employee characteristics affects one's transitions and wages. For example, in Australia, women and lowly educated are more likely to end up in a situation where temporary employment works as a trap instead of a bridge (McVicar et al., 2019). Moreover, the heterogeneity of the career trajectories also means that depending on the career trajectory one is on, the negative effect of temporary employment on one's wage differs. The negative effect is the largest for the ones in entrapment trajectory (Fauser, 2020; Reichenberg & Berglund, 2019), while the ones on probation contracts do not have a wage penalty compared to permanently employed (Skedinger, 2018). Lastly, permanent employment should not be considered as the only optimal end-state as even permanent

employment may come with low employment and income security. Hence, neither temporary or permanent employment should be looked as one group, but the heterogeneity in them should be understood.

In accordance with the presented research, treating temporary employment as a more heterogenous group will be in focus of the analysis. For the Norwegian data, we will differentiate between different type of temporary employment (substitute, project worker, extra help etc,) as well as the sector one works in (public, private or municipality) and the hours worked (full-time, or long or short part-time) in order to analyse how treating temporary employees as a heterogeneous group affects their transition probabilities. Additionally, we have plenty of employee characteristics whose role in transitions can be analysed, such as gender, age, marital status and children, and educational background. Even though we do not perform sequence analysis, but study the transitions between two timepoints, the timepoints chosen will be as far apart as the data allows us to have. This is relevant as sequence analysis has shown that there are several transitions individuals go through throughout their careers, and, hence, having the maximum time of two years that the Labour Force Survey data allows us to study, we can see more of an end-state of the transitions than just studying what is the status of the employees next quarter. The longer the time interval is, the more likely the employees have transitioned to their more permanent end-state whether that being permanently or temporarily employed or being unemployed or transitioning outside of the labour force. The timeframe of two years is the same as Berglund et al. (2017) used in Sweden when studying the transition probabilities of temporarily employed and differentiating between the different contract types.

2.3 Labour market policies

2.3.1 Labour market segmentation

Temporary employment can be looked as from the perspective of the phenomenon being part of the bigger picture of labour market policies, labour market segmentation and non-standard employment. European labour market has been segmented (or dualized) into secure and insecure jobs in the form of permanent and temporary employment. Permanent employment consists of workforce with permanent, open-ended contracts that have strict dismissal policies,

and temporary employment consist of other non-standard type of employment, especially of employees with fixed-term contracts and contract types that are more flexible in terms of the dismissal policies (Eichhorst et al., 2018; Eichhorst & Marx, 2020).

Eichhorst and Marx (2020) define a labour market being segmented when there is a group of employees that are protected from market fluctuations in terms of permanent employment and other group of employees that are excluded from this employment protection. Labour market segmentation is linked with insider-outsider theory. Labour market insiders are typically employed full-time with a permanent contract unless they have wished to work part-time or on temporary basis, as opposed to outsiders who are unemployed, working part-time against their wish, or full-time with a temporary contract. Insiders are characterized by having a much lower risk of job loss when compared to outsiders whose temporary contracts provide poorer job protection (Rueda, 2005).

From the segmentation (and insider-outsider) perspective, employers use non-standard and temporary employment as a buffer in market fluctuations by providing employers more flexibility with their workforce. Employers use temporary employment to respond to short-term vacancies, seasonal fluctuations in product demand and to economic shocks or booms (Gash, 2008; Masui, 2020). In addition, temporary contracts are beneficial for employers as job protection for this group is lower, they are easier to fire and their bargaining power regarding to their wages is lower than of permanent employees (Bassanini & Duval, 2006; Eichhorst & Marx, 2020).

The use of non-standard and temporary employment is changing in Europe as the deregulation of non-standard employment has been a trend in Europe in the past decades (Eichhorst et al., 2018). After the 2008 Great Recession, there has been a trend of deregulation of the policies with the idea of deregulation leading to increased employment, especially with the groups of people who have had a harder time entering the labour market or maintaining constant employment. However, the target of the deregulation policies has become deregulation of non-standard employment, while standard, permanent employment has stayed untouched (Barbieri & Cutuli, 2016).

Barbieri and Cutuli (2016) find that EPL reforms focusing on deregulating the non-standard employment have not managed to integrate socially disadvantaged to the labour market, to

increase the overall employment nor to provide job seekers with secure employment. The negative effects of the deregulation have been the strongest in Southern European countries, where the unemployment levels have stayed the same and employees struggled to transition from temporary to permanent employment, while in the Nordic countries, deregulation policies have led to more beneficial end results as temporary employment has helped employees to transition out of unemployment and towards more permanent employment. Where Barbieri and Cutuli (2016) find evidence for deregulation policies not increasing the overall employment, Jahn et al. (2012) find contradictory results. Their research finds support for the argument that deregulation of temporary contracts leads to higher levels of total employment in the European context, which is the argument often used for deregulation. However, they find that even though the total employment has increased, so has the inequality between employees with permanent or temporary contracts in terms of their household income. Thus, both research conclude that the deregulation of non-standard employment has increasingly widened the gap between insiders and outsiders in the European labour market.

Overall, the labour market segmentation into labour market insiders and outsiders is a current topic in many European countries and legislation attempts tackling the issue are discussed and presented. In 2015, in Norway, there was a deregulation policy passed that liberalized more the legislation concerning the use of temporary employment in Norway and that will be introduced next.

2.3.2 Legislation change of temporary employment in Norway

The use of temporary contracts is regulated specifically in Norway. The Work Environment Act (*Arbeidsmiljøloven*) regulates employment in the private and municipal sector and Civil Service Act (*Tjenestemannsloven/ Statsansatteloven*) in the governmental sector (Nergaard, 2018; Svalund & Nielsen, 2017). The Work Environment Act was amended in 2015, and the use of temporary contracts and the length of an individual contract were made more liberal. Besides this policy change of 2015, the legislation concerning temporary contracts has been

relatively unchanged in Norway for the past two decades[1] (Nergaard, 2016; Svalund & Berglund, 2018).

Similar arguments as in other European countries were used for deregulation in Norway. When the Work Environment Act was being amended in 2015, the Ministry of Labour and Social Affairs proposed that even though permanent employment is seen as the main form of employment, easier access to the labour market via temporary employment should be encouraged. It was argued that temporary employment can help people with reduced employability or with uncertainties about their productivity to enter the labour market as temporary contracts reduce the risks and costs carried by the employers in case of a non-suitable hire and a need to terminate the employment contract. Temporary employment was presented acting as a springboard into working life for people outside of the labour market (Arbeids- og sosialdepartementet, 2015).

The amendment came into force on 1.7.2015. A single temporary contract can now last for up to 12 months (previous maximum being 6 months), and employers can hire workers with temporary contracts without providing special reasons. However, if a person is hired for temporary contracts in the same company performing same tasks for three years in a row, the person is now considered permanently hired (Arbeids- og sosialdepartementet, 2015; Nergaard, 2016; Svalund & Berglund, 2018). This rule was made stricter as before it was a four-year-rule. Additionally, the law was changed so that if a person, who is hired with temporary contracts without a reason, is not given a permanent position after the three years, a company cannot hire another person to perform the same tasks with a temporary contract immediately, but there is a 12-month quarantine time for a new hire (Nergaard, 2016). Hence, employers cannot chain temporary contracts, but instead, if the nature of the work is permanent, the employer should permanently hire the employee.

Furthermore, legislation of the governmental sector on temporary employment has been brought closer private and municipal sector after the 2015 policy change because the Civil

[1] Besides the amendment of 2015, the center-right government proposed and passed a law on liberalization of temporary contracts in 2004, but the new center-left government elected 2005 reversed the law changes and made the regulation even stricter (Nergaard, 2016; Svalund et al., 2016).

Service Act for the governmental employees was considered to be looser than the Work Environment Act regulating the private sector and municipalities. Hence, the law was changed, and the use of temporary contracts became stricter[2]. The change became effective in June 2017. Now in the governmental sector as well the use of temporary contracts is limited to three years, and a person is considered permanently employed after consecutive employment in in the same position with temporary contracts for three years. However, the maximum use of 12 months of a single temporary contract that was introduced in the private and municipal sector does not concern the governmental employees as the maximum duration of a single temporary contract when the need for workforce is temporary is still 6 months. However, substitutes can have longer contracts depending on the length of the leave (Nergaard, 2018).

Overall, all private, municipal, and public sectors in Norway have faced deregulation on the legislation concerning temporary employment in Norway. The main change has been that the temporary employment contract can be now for a longer period (private and municipal sector) and that after three consecutive years of service, a temporary employee should be permanently hired. In this thesis we will study whether the liberalization of the labour law has changed the number of temporary employees in total and within subgroups in Norway.

[2] The law was changed from *tjenestemannsloven* to *statsansatteloven*, and the new law consisted of stricter regulation on temporary employment.

3. Research questions and hypotheses

In this thesis, we will treat temporary employees in Norway as a heterogeneous group and study how different groups of temporarily employed transition in the labour market. We assume that depending on the employers' motives for hiring labour temporarily and the type of contract a temporarily employed person has, the likelihood of transitioning from temporary to permanent employment may differ (Berglund et al., 2017; Svalund & Nielsen, 2017). Additionally, as international research (Berglund et al., 2017; Fontaine et al., 2020; Stecy-Hildebrandt et al., 2019) has shown that the public and private sectors hire different types of workers and the use of temporary employment and transitions in the sectors differ, in this thesis we will also investigate whether the sector of employment affects the transition probabilities. Therefore, the research questions one and two are

> *Research question 1: Do different types of temporarily employed people have different transition probabilities to permanent employment, temporary employment, or unemployment after a two-year interval in Norway?*
>
> *Research question 2: Do public and private sector employees differ in terms of transition probabilities to permanent employment, temporary employment, or unemployment after a two-year interval in Norway?*

In accordance with the international research, we expect that

> *Hypothesis 1: Temporary employees with more permanent status (probation contracts) are more likely to transition to permanent employment, and the ones with more seasonal status (extra work) are less likely to transition to permanent employment.*
>
> *Hypothesis 2: Public sector employees are less likely to transition to permanent employment.*

In addition, the impact of the legislation change concerning temporary employment will be studied in Norway. Hence, the third research question is

Research question 3: What is the effect of the 2015 policy change on the use of temporary employment in Norway?

As the 2015 legislation change made the use of temporary contracts more liberal (Nergaard, 2016; Svalund & Berglund, 2018), our hypothesis are

Hypothesis 3: The liberalization of the legislation has increased the use of temporary contracts.

Hypothesis 4: Depending on the temporary employment contract type, the legislation change has had a different effect. The use of temporary employment on screening has increased, while seasonal temporary employment has not been affected by the policy change.

Hence, we test whether the policy change has increased the use of temporary contracts as it is now easier from the employer perspective to use the contracts. If this is the case, it can be the use of contracts has increased in certain groups within the temporarily employed and not all are affected by the legislation change.

4. Data

4.1 Norwegian Labour Force Survey (AKU)

Data used in the study is from Norwegian Labour Force Surveys (Arbeidskraftundersøkelsene, AKU) and the data has been made available via Norsk Samfunnsvitenskapelig Datatjeneste (NSD). In AKU, people between 15-74 years old who are registered living in Norway are interviewed via phone. Participants in AKU are interviewed for eight consecutive quarters (for two years in total) to collect data on individuals' labour market situation and employment in Norway. Each quarter, 24 000 people are chosen to be interviewed (Bø & Håland, 2015).

Sampling is done at household-level. One household member is being sampled and contacted and the rest of the household members who fall under the age range of 15-74 years are interviewed. Most of the participants are interviewed directly, but some are interviewed indirectly i.e., a household member is answering for them. The sub-sample is stratified based on county (fylke), and it is re-evaluated each quarter based on age, gender, and county in order for the sub-sample to be a good presentation of the current population (Bø & Håland, 2015).

In the thesis, we will use data from 2006 quarter one onwards since it follows the same structure to this day. 2006 was the year when AKU survey was revised and changes were made in the questionnaire, i.e. some variables and variable names differ compared with the previous years' surveys. The revision was part of bigger changes made at the EU level, and the collection of data at the Norwegian level was brought to follow the common EU standards (Bø & Håland, 2015).

The key concepts for the analysis are how permanent, temporary, full-time, and part-time employment are defined in Norwegian LFS. In AKU, a person is considered temporarily employed when one's main employment is limited in time (employment contract having a fixed end-date or contract end-date being tied to project end-date) or when work is clearly seasonal. If one has more than one job, the status of being permanently or temporarily employed is considered based on the main employment contract (Bø & Håland, 2015). Temporary employment has been surveyed in the AKU Labour Force Survey from 1996 onwards. However, only from 2006 onwards, the supplementary questions related to

temporary employment (i.e. desire for permanent employment and duration of the employment contract) have been asked each quarter. Before, these questions were only asked the second quarter of the year (Bø & Håland, 2015). This also supports why choosing the sample from 2006 onwards is relevant.

In AKU, employment is defined as full-time if the weekly hours are of 37 or more. Part-time employment is defined as under 37 hours per week. Long part-time employment is when working hours are between 20 to 37 hours per week and short part-time employment is when the hours per week are less than 20 (Bø & Håland, 2015).

Data used in the analysis will be from AKU panel files provided by the NSD. In the panel files, NSD has collected the participants that have followed through the eight quarterly surveys of AKU. Hence, the number of participants in each panel is lower than the whole number of participants in the LFS since not all participants follow through all eight interviews. The first panel file in the analysis covers the period between quarter 2006 and quarter 4 2007. From there, panel files for each quarter are included and the last cohort to be included covers the period of 2018 quarter 1 to 2019 quarter 4. No newer cohorts are included in order to exclude the effect of corona on transitions from the analysis. Hence, in total, the largest suitable sample from 2006 onwards, allows to include 49 cohorts. Each cohort size range between 2850 to 2997 participants totalling to 143 374 individuals. However, the actual sample will be narrowed down from this even further when controlling whether they have observations for the analysed variables.

Data will be analysed in RStudio (RStudio Team, 2021). For summary statistics and tables, compareGroups (Subirana & Salvador, 2021), Hmisc (Harrell, 2021) and sjlabelled (Lüdecke, 2021) packages will be used, and for tables for the regression results, stargazer (Hlavac, 2018) package is used. Base R is used for linear and logit regression analysis, and plm (Croissant et al., 2021) package is used for the fixed effects regression in the robustness checks.

4.2 Data cleaning

Before modelling, the data needed to be organized and cleaned. Firstly, it needs to be noted that there have been some coding changes in the variables in AKU throughout the years.

Mainly these changes have taken place as the coding has been changed to match the international / EU standards on recording certain variables (Bø & Håland, 2015). Many of the changes do not affect the variables we use in the analysis except for the variable educational background, which was revised to follow international standards for educational coding. The new coding was introduced 2006, while old coding was continued until 2007 (Bø & Håland, 2015). Hence, we can use the new coding for all the years taken into the sample.

Secondly, when observing the variables included in the analysis, one issue was that there were values in the questions outside of the range of the question and those values did not carry a meaning. For example, in many questions there were additional values of 8 or 9 or both, and interviewers had used those values to insert not applicable or does not know (uoppgitt) instead of leaving the question blank (missing value). For the analysis, these types of values were treated as missing answers and recoded in the data as non-applicable (NA). Table A1 in the Appendix presents for which of the variables this type of recoding was done.

Thirdly, there was recoding needed in one of the key variables that records one's status in the workforce V010 (Main status in the workforce) where the values starting with 100 record the employed, the ones starting with 200 record the unemployed and then the ones starting with 300 record the people outside of the labour force. The recoding needed was a bit different than in other variables since it was due to typos in the categories, which were then corrected by coding the observation under the correct category. This concerned only a small number of observations (21 obs.).

4.3 Data validity with survey data

As we are using survey data, we need to acknowledge that there can be some issues with the data accuracy. Pavlopoulos and Vermunt (2015) study the measurement error in research that focuses on transitions from temporary to permanent employment. By using Dutch data, they find issues with both LFS data and registry data when recording the employment status (permanent or temporary). They find that, unlike usually thought of, registry data is more prone to errors than survey data, but with registry data the correctness of the original registry entry is important. If the original entry contains errors, then these errors are likely to carry

forward, whereas, if the original data entry is error-free, registry data is likely to have only few errors.

With survey data, the errors occur as the respondents misreport contract status as they are not aware of their contract type (i.e. specifically young people may report themselves as permanently employed as the employer has talked about opportunities in the future even though their actual contract is temporary) or the interviewer marks the status wrongly. Another issue is that indirect interviews are used in LFS and one household member answers on behalf of the others if they are not available when the interviewer contacts the household (Pavlopoulos & Vermunt, 2015). These indirect interviews are also used in the AKU LFS in Norway. These indirect interviews lead to a possible measurement error since the household member interviewed may not know the correct answer to all the questions and, hence, give incorrect information. It is estimated that temporary employment is on average underestimated among those who are interviewed indirectly and the effect is the largest for those under 30 years (Bø & Håland, 2015).

When Statistics Netherlands researched the inconsistencies in the data about employment contract type from 2011, they found that the two data types – LFS survey data and registry data – have inconsistences as of the ones having a permanent contract on the LFS, over 15% have a temporary contract status on the registry. On the other hand, over 18% of the ones having a temporary contract on the LFS have a permanent contract on the registry. Hence, there are large inconsistences with one's contract type between the two data types (Pavlopoulos & Vermunt, 2015).

Pavlopoulos and Vermunt (2015) found that these measurement errors lead to overestimation of transition probabilities between temporary and permanent employment. With Dutch data from 2007, they find that in the survey, the percentage of employees working on a temporary contract is underestimated. The percentage in the LFS was 8.9%, but after correction for the measurement error percentage rose to 10.9%. Hence, studying transitions with numbers that underestimate the number of employees with temporary contracts does not give correct probabilities for the transitions. They found that in 3-month time frame, the transition probability from temporary to permanent employment was 5.7% with LFS survey data and 8.5% with registry data and 3.2% with their model where they corrected for the initial

measurement error in the number of temporarily employed. Hence, the transition probability was lower than with the survey or registry data. This should be taken into account with AKU data in Norway. If in AKU the number of temporarily employed people is underpresented, the results that we get may overestimate the probability of transitions between temporary and permanent employment.

Additionally, LFS drop-out rate may also affect the external validity of the results. The drop-out rate may lead to under- or overrepresentation of the population. The drop-out rate in AKU for the first interview has been varying between 11.9% to 19.9% in 2006-2014. Since 2012, the drop-out rate has been close to 20 percent of the chosen 24 000. The main reason for the drop-out rate is that the selected participants are not reached by telephone and secondly that they refuse to take part in the survey. Drop-out rates in the sample may lead to problems with external validity of the results if certain types of participants systematically drop out from the survey (Bø & Håland, 2015). For example, non-standard employment may be underpresented in the LFS since these employees may be harder to reach. The interviewers may have a hard time reaching people who are working in shifts compared with for example people working during regular office hours and this may bias the results.

4.4 Building the sample

Even though the largest possible sample with individuals who have completed the survey for all eight interview rounds is 143 374 (starting in 2006 quarter 1 and ending in 2019 quarter 4), the sample for the analysis needs to be narrowed further. Since we want to follow transitions of employed and specifically, temporarily employed people, we need to select the sample of people such that we have this information when they enter the survey (round 1). The variable *Main status in the workforce,* V010, is the variable that measures this. However, similar to what Pavlopoulos and Vermunt (2015) have found in the Netherlands, there are vast inconsistencies with the Norwegian LFS data even when comparing information between two variables in the AKU survey. When we compare information on variable *Main status in the workforce* V010 to variable *Permanent or temporary employment,* V035, Table 1 below present the number of observations in the whole sample (including all rounds between 1-8):

Table 1 Number of observations between one's employment status and type of work contract

V010 Main status (coding values)	V035 Permanent/ temporary employment	Total	Total in % within the status
Employed (101-129)	Permanent	583 726	84.8%
	Temporary	51 222	7.4%
	Does not know	2 232	0.3%
	NA	50 901	7.4%
Jobseeker (232-249)	Permanent	2 277	10.9%
	Temporary	426	2.0%
	Does not know	41	0.2%
	NA	18 190	86.9%
Outside of the labour force (362-369)	Permanent	9 454	3.5%
	Temporary	1 926	0.7%
	Does not know	326	0.1%
	NA	260 493	95.7%

For the ones who are considered employed, there are not really inconsistencies between the two variables. Out of the employed people, there are 0.3% observations where, at some point of the panel, a person does not know whether they have a permanent or temporary contract and 7.4% observations where we do not have the information about the contract type available. For the analysis, this is missing information since we want to study transition from and to permanent and temporary employment and in order to do so, we need to know whether one is permanently or temporarily employed. However, even though the information is missing, it is not inconsistent. With jobseekers and people outside of the labour force, the situation is more problematic as there are inconsistencies with the information provided by the two variables. Out of the jobseekers, there are 10.9% observations registered as permanently employed and 2.0% as temporarily employed. Out of the people outside of the labour force, 3.5% observations are registered as permanently employed and 0.7% as temporarily employed. Similar to Pavlopoulos and Vermunt's (2015) study in the Netherlands, these inconsistencies draw concern to the accuracy of the data and how that may affect the validity of the results. Hence, the sample is further defined to only include observations where the main labour force status and work contract type are consistent with each other. Excluding the inconsistent

observations allows us to use more reliable data in the analysis and, thus, have more reliable results in the end.

How the people in the original sample are divided between the different labour force statuses in round 1 is presented in Table A2 in the Appendix. In order to select the sample for the analysis, firstly, the sample is narrowed so that it presents the ones in permanent or temporary employment and unemployment on round 1. This is used as the base in order to perform summary statistics and compare whether the characteristics of the temporarily employed differ from permanently employed or unemployed people. A person chosen for the sample to be representing employed people will be either in groups *111 Employed, employee* or *121 Temporary absence, employee.* These two are the main categories out of the employed people. Since paid employment is the most typical form of employment, the analysis will focus on them, and other marginal groups such as self-employed are left out of the sample. The employees chosen for the sample will then be more homogenous, and the results of the analysis then more relatable to employees working as paid employees. Additionally, for unemployed people only the category *237 Jobseeker, unemployed* is included to the sample since that category covers the officially registered unemployed people. Out of jobseekers, this is also the most typical status to have.

When analysing and deciding whether the employees who are temporarily absent from work should or should not be included in the sample, we see that the reasons for temporary absence from work are typical, short-term absences and should not vastly affect their transitions in the labour market. For example, the most common reasons why a person has been recorded to be temporarily absent from the work is because they are on annual holiday (48.3%), own illness or injury (22.2%), maternity leave (9.9%), and working time arrangements (8.6%). Annual holiday or working time arrangements should not affect labour market transitions. What could affect the transitions are for example own illnesses or maternity leave; one could either be more eager to change positions and find other type of work or, if one is on a longer leave, they are not actively changing positions since their work status in their life situation is not actual for them. However, whether there is an effect on the transitions nor which way the effect would go is unclear. Hence, people on temporary leave are also included on the sample as there is no clear reason to exclude them.

Once these categories (111, 121, and 237) have been selected to the sample, the sample is further narrowed by ruling out possible inconsistencies with *V035 Permanent/ temporary employment*. Only people who are employed (category 111 or 121) in round 1 and who we know to be either having a permanent or temporary contract in round 1 are included. If an employed person has a does not know or a missing value as their contract type, they are excluded from the sample. Similarly, out of the unemployed people (category 237) only the ones who have a missing value in their work contract status are included in the sample and the rest are excluded. This leads to a sample of 77 470 individuals compared to the original 143 374 individuals. The smallest cohort is of size 1379 and the largest 1756.

Table 2 below presents how the people in the chosen sample are divided between the different labour force statuses and contract types.

Table 2 Sample for the study - labour force status and contract type on round 1

	Permanent	Temporary	Unemployed
Total	67 592	8 100	1 778
111 Employed, employee	56 121	6 963	-
121 Temporary absence, employee	11 471	1 137	-

Lastly, when analysing the heterogeneity and the transitions of the temporarily employed people, the sample is narrowed down to only include the ones who are temporarily employed in round 1. Altogether, the sample size for temporary employed will be 8 100 people, where the smallest cohort is 128 people and the largest 213. However, in the analysis itself, this sample size can further go down in case there are people who have missing values in the variables that will be regressed.

4.5 Summary statistics of the sample

In this section we have presented the summary statistics for the sample. Table A3 in the Appendix contains descriptive statistics for the entire sample of data which we initially acquired from NSD. Table 3 below presents the sample to be used in the analysis. It contains individuals in the labour force in the first round of interviews conducted between 2006 Q1 and 2018 Q1 and it describes the distribution of permanently employed, temporarily employed and

unemployed across demographic variables namely sex, age, educational background, being a student, marital status and having children. Furthermore, as temporary employees are the main focus of the study, in Table 4 below, we have presented the distribution across the employment related variables namely type of employment contract, employment sector, full- or part-time work, type of working hours, number of work contracts, fixed or non-fixed working hours, company size, wish for other working hours and trying to get longer working hours. Temporary employees are shown with permanent ones in order to show how the groups differ.

Table 3 Summary descriptives table by groups of `Status in the labour force'

	Permanently employed *N=67592*	**Temporarily employed** *N=8100*	**Unemployed** *N=1778*	**N**
Sex:				77470
Male	34807 (51.5%)	3395 (41.9%)	1023 (57.5%)	
Female	32785 (48.5%)	4705 (58.1%)	755 (42.5%)	
Age in years:				77470
15-24	6218 (9.2%)	3464 (42.8%)	432 (24.3%)	
25-34	12631 (18.7%)	2055 (25.4%)	469 (26.4%)	
35-44	17196 (25.4%)	1200 (14.8%)	409 (23.0%)	
45-54	17050 (25.2%)	702 (8.7%)	303 (17.0%)	
55-64	12745 (18.9%)	406 (5.0%)	152 (8.5%)	
65-75	1752 (2.6%)	273 (3.4%)	13 (0.7%)	
Level of Education:				77470
Primary Education	11375 (16.8%)	2540 (31.4%)	660 (37.1%)	
Secondary Education	29969 (44.3%)	2758 (34.0%)	684 (38.5%)	
Bachelor or higher	25775 (38.1%)	2582 (31.9%)	380 (21.4%)	
'Missing'	473 (0.7%)	220 (2.7%)	54 (3.0%)	
Student:				77470
Yes	1080 (1.6%)	616 (7.6%)	17 (1.0%)	
No	66351 (98.2%)	7357 (90.8%)	1761 (99.0%)	
'Missing'	161 (0.2%)	127 (1.6%)	0 (0.0%)	
Marital status:				77470
Unmarried	13419 (19.9%)	4135 (51.0%)	740 (41.6%)	
Married or equivalent	54086 (80.0%)	3951 (48.8%)	1033 (58.1%)	
'Missing'	87 (0.1%)	14 (0.2%)	5 (0.3%)	

	Permanently employed *N=67592*	**Temporarily employed** *N=8100*	**Unemployed** *N=1778*	**N**
Has children:				77470
Yes	13032 (19.3%)	1534 (18.9%)	350 (19.7%)	
No	54560 (80.7%)	6566 (81.1%)	1428 (80.3%)	

We see from Table 3 that with permanently employed, the sample is quite balanced between men and women, but there are more women (58.1%) in temporary employment and more men (57.5%) in unemployment.

It is important to observe from Table 3 that temporarily employed are mostly young people. Age group 15-24 is well-presented as 42.8% of the temporarily employed belong to this age group. Permanently employed are mainly middle-aged and in the unemployed, there are more young individuals, and the observations are skewed towards the young.

In terms of education, temporary employed are quite evenly distributed among the three educational levels. With permanently employed, there is fewer people with primary education and the most common is to have at least secondary education which is 44.3%. Compared to temporary employed and unemployed, among the permanently employed is the highest percentage of individuals with the highest education – bachelor level or higher. Among unemployed, primary and secondary education as the highest education level is quite evenly distributed and people with higher education as the highest educational level is less common than with permanently or temporarily employed.

Being a student in higher education is more common for temporarily employed than permanently employed or unemployed. Among the temporarily employed 7.6% are students, while only 1.6% of the permanently employed are students only 1% of the unemployed.

In terms of marital status, there is big differences between the groups as most of the permanently employed are in stable relationships (80.0%), whereas out of the temporary employed (48.8%) and out of the unemployed (58.1%) are. This correlates with the fact that permanently employed are older and in more stable stages in their lives than temporarily employed who are mainly young people.

Table 4 Summary descriptives table by groups of `Employed status in the labour force'

	Permanently employed ***N=67592***	**Temporarily employed** ***N=8100***
Contract type:		
Project employee	0 (0.0%)	1496 (18.5%)
Extra help	0 (0.0%)	1894 (23.4%)
Substitute	0 (0.0%)	3109 (38.4%)
Trainee	0 (0.0%)	898 (11.1%)
Probation	0 (0.0%)	196 (2.4%)
Labour market measure	0 (0.0%)	50 (0.6%)
Other	0 (0.0%)	434 (5.4%)
'Missing'	67592 (100.0%)	23 (0.3%)
Employer type:		
Private	44043 (65.2%)	4259 (52.6%)
State	8321 (12.3%)	1238 (15.3%)
Municipality	13354 (19.8%)	2306 (28.5%)
County municipality	1678 (2.5%)	215 (2.7%)
'Missing'	196 (0.3%)	82 (1.0%)
Full- or part-time employment:		
Full-time	52174 (77.2%)	4159 (51.3%)
Long part-time	8794 (13.0%)	1609 (19.9%)
Short part-time	6556 (9.7%)	2274 (28.1%)
'Missing'	68 (0.1%)	58 (0.7%)
Working for the same employer over a year:		
Yes	60330 (89.3%)	3722 (46.0%)
No	7253 (10.7%)	4375 (54.0%)
'Missing'	9 (<0.1%)	3 (<0.1%)
Main employment - working hours:		
Fixed working hours	51680 (76.5%)	4358 (53.8%)
Varying hours	12275 (18.2%)	2017 (24.9%)
No agreement	3384 (5.0%)	1203 (14.9%)
Random hours	28 (<0.1%)	45 (0.6%)
Called in	223 (0.3%)	477 (5.9%)
'Missing'	2 (<0.1%)	0 (0.0%)
Number of contracts:		

	Permanently employed *N=67592*	**Temporarily employed** *N=8100*
1	62256 (92.1%)	7105 (87.7%)
2	5336 (7.9%)	995 (12.3%)
Company size - no of employees:		
1-10	14718 (21.8%)	1586 (19.6%)
11-49	22814 (33.8%)	2631 (32.5%)
50-199	13121 (19.4%)	1256 (15.5%)
200 or more	13185 (19.5%)	1245 (15.4%)
'Missing'	3754 (5.6%)	1382 (17.1%)
Wish for other working hours:		
Yes	6179 (9.1%)	1294 (16.0%)
No	55011 (81.4%)	5106 (63.0%)
'Missing'	6402 (9.5%)	1700 (21.0%)
Trying to get longer working hours:		
Yes	1855 (2.7%)	647 (8.0%)
No	2049 (3.0%)	426 (5.3%)
'Missing'	63688 (94.2%)	7027 (86.8%)

Table 4 compares temporary employees to permanent ones in terms of employment related variables. The most common category for temporary employees is to be a substitute (38.4%) followed by being an extra help (23.4%) or project employee (18.5%).

More permanent than temporary employees work in the private sector 65.2% to 52.6%, slightly more temporary employees work for the state with 12.3% to 15.3% and less permanent than temporary employees work in the municipalities 19.8% to 28.5%. Hence, permanent employment is more common in the private sector and temporary employment in the public administration and municipalities.

Most permanent employees work full-time 77.2%, whereas half of temporary employees work full-time and after that short part-time (28.1%) is the next common form of employment. Majority of the permanently employed have worked for the same employer for over a year, whereas less than half of the temporarily employed have done so. Another way to measure the working hours is whether the hours are fixed or non-fixed. The distribution is similar as 76.5%

of the permanently employed have fixed working hours, whereas 51.3% of the temporary employed have fixed working hours meaning that 48.7% of temporarily employed work with non-fixed working hours.

The percentage of people having two employment contracts is slightly higher among the temporarily employed (12.3%) compared with the permanently employed (7.9%). For both permanently and temporarily employed, it is the most common to work for a relatively small employer, an employer with 11-49 employees. It is more common for temporarily than permanently employed to wish for other working hours (16.0%) and to actively seek for longer working hours (8.0%).

Overall, it can be concluded that the employment characteristics of temporarily and permanently employed are at contrast and vary largely from one another. More temporary employees work in the public sector and more of them perform part-time work or have non-fixed working hours than permanent employees.

5. Methodology

5.1 The linear probability model vs non-linear probability model

When choosing how to model the transitions, both linear probability model (LPM) and non-linear probability model (logit/ probit) are alternatives to consider. The key feature that differentiates LPM from logit/ probit models is that LPM assumes that the response probabilities are linear in parameters. On the other hand, for logit and probit models, the response probabilities share a non-linear relationship with the independent variables. In logit regressions, the nonlinear function that links the probability of success to the explanatory variable has a standard logistic distribution while for probit models, the linking function follows a cumulative normal distribution. Both logit and probit provide similar outcomes (Wooldridge, 2003, pp. 530–531)

Chatla and Shmueli (2013) have performed an intense review of relevant literature where they argue that despite its potential shortcomings LPM is still useful when the goal is to deduce inference and classification. LPM is a popular tool of statistical analysis in social sciences as it is advocated for easy interpretation and application which the non-linear probability models do not have. Therefore, we believe that the use of LPM is a valid tool of analysis for our thesis as well.

Furthermore, Angrist and Pischke (2008), in their book highlight practical advantages of using LPM in the light of causal interpretation of coefficients as compared to using logit or probit. They mention that even though of non-linear functions are more suitable for conditional expectation functions, it matters very little when it comes to compute marginal effects. They further mention, non-linear functions are substantially more complicated for inference as standard errors are required computing marginal effects. On the other hand, coefficients in LPM can be directly interpreted as marginal effects which is why it is often preferred over non-linear probability models.

A possible consequence of using LPM is the risk of having an unbounded response function for the probability. This implies that often the use of LPM may lead to probabilities greater than one or less than zero for certain values of the independent variable. This can be

problematic since probabilities should always be within a range between zero to one. Furthermore, it may be the case that the relationship between the explanatory variable and the probability of success may not share a perfectly linear relationship. It can be the that for lower values of the independent variable the marginal effect is larger and the converse is true for higher values of the independent variable. This phenomenon is observed mostly for continuous independent variables. However, our analysis does not suffer from this issue as we use categorical independent variables in all of our analysis. Furthermore, for the purpose of comparing groups and classifications, the unrestricted linear probability functions seldom pose a threat to inference. Additionally there is no guarantee that the approach will not work either. (Friedman et al., 2009, p. 103). Therefore, the issue of probabilities above one and below zero is less likely to create problems in our thesis as the analysis is performed based on classifying and grouping the data. Furthermore, Chatla and Shmueli (2013) in their study also emphasize on findings of Anderson (1987) which states that coefficients certain of group or observation specific dummies can only be estimated using LPM and not logit. Additionally, when the goal of the estimation is inference, and the sample is large enough, LPMs and logit/ probit produce qualitatively similar outcomes.

On the other hand, the use of non-linear probability models come with potential advantages. These advantages are strict restriction on the probability of success to remain in the range of zero to one and modelling nonlinear relationships between the explanatory variables and the probability of success. Thus, for the purpose of checking whether our results are consistent, we also employ logit and run the same analysis to ensure the credibility and robustness of our estimates. Since marginal effect cannot be directly interpreted from the coefficients of the logit model, the size cannot be directly compared with the LPM model, but we are particularly interested in the directions/ signs of the coefficient of the covariates in order to compare that they are consistent between both LPM and logit.

Therefore, given that the qualitative outcomes are similar, we prefer in our thesis to use LPM due to the advantages of LPM over logit or probit. The advantages of LPM are the ease of inference and estimation of marginal effects based on classification that will be optimal in the analysis performed in this thesis. Hence, we will be using linear probability model as our primary tool of econometric analysis.

5.2 Dependent variable(s)

In our upcoming analysis we will be modelling how the mobility of individuals from temporary to permanent employment are affected due heterogeneity of temporary employees. We will further also investigate the impact on transitions to remain in temporary employment and lastly, transitions to unemployment. Hence, the central dependent variable for our analysis is labour market outcome.

Since the length of the labour force survey data for an individual is eight consecutive quarters, in our model, we will be comparing the labour market situation of an individual with temporary employment from the first point they entered the labour force survey to the time they exit the survey after eight quarters (close to a two-year period). Specifically, we are interested in the probability that an individual having temporary employment at measuring point 1 to have permanent employment, temporary employment, or unemployment as their labour market status at measuring point 8. Since our analysis studies transitions to various labour market statuses the outcome variable represents whether the transition occurred or not. To describe the transitions separately we have created separate dummy variables for each of the transitions to permanent employment, then for remaining in temporary employment and lastly, the transitions to unemployment in round 8 of the survey respectively. Hence, we use three separate dependent variables which take the value of one if the individual is permanently employed (or temporarily employed or unemployed) in round 8 of the survey and zero otherwise.

the transition occurred in round 8 of the individual's participation in the labour force survey and zero otherwise. Thus, the outcome variable is always binary. For these one-zero dependent variables, the suitable econometric approaches include linear and nonlinear probability estimation techniques (Wooldridge, 2003, p. 233). As explained in the previous section, the analysis is designed so that we use linear probability model (LPM) as our main focus and have chosen logit regressions as part of the robustness analysis.

5.3 Regression analysis

We have constructed our analysis so that in *Model 1*, we exclusively analyse a sample of individuals with only temporary contracts where we estimate their transitions to permanent employment, temporary employment and unemployment to address *research question 1 and 2*. Therefore, according to the description in *section 5.2* the dependent variable of choice for our analysis in this model is then having a permanent contract, temporary contract or being unemployed in round 8.

We want to look into heterogeneity amongst different groups. Therefore, independent variables of interest include contract type of temporary employment, employment sector, full-time or part-time work, and whether the employee is working long term for the same company. Furthermore, in *Model 1*, we have controlled for age, gender, education, marital status, having children, being a student, and yearly and quarterly variations.

Model 1 is being estimated with LPM and has the following functional form:

$$Employment\ Status_{i,t=8} = \beta_0 + \beta_1 Contract_{i,t=1} + \beta_2 Sector_{i,t=1} + \beta_3 Full\ time_{i,t=1} + \beta_4 Same\ employer_{i,t=1} + \beta_5 controls_{i,t=1} + e_{i,t}$$

Where,

-In case of transition to permanent employment, $Employment\ Status_{i,t=8}$ takes the value of 1 when one is permanently employed in round 8 (t=8) and 0 otherwise. Likewise, the regressions concerning transition to temporary employment and unemployment follow the same logic and take the value of 1 when one is temporarily employed or unemployed in round 8 (t=8) and 0 otherwise.

- $Contract_{i,t=1}$ is a categorical variable for differentiating between various types of temporary employees in round 1 (t=1) with temporary employees working as substitutes as the reference category.

- $Sector_{i,t=1}$ is a categorical variable for differentiating between private sector, state and municipality administration in round 1 (t=1) with temporary employees in the private sector as the reference category.

- $Full\ time_{i,t=1}$ is a categorical variable for differentiating full-time or part-time work in round 1 (t=1) with temporary employees in full-time work as the reference category.

- $Same\ employer_{i,t=1}$ is a dummy variable which takes a value of 1 if the individual *i* has been working for the same company for over a year in round 1 (t=1) and 0 if not. The individuals who have been working in the company for less than a year are the reference category.

-$controls_{i,t=1}$ is a matrix of control variables such as age, educational level, gender, civil status, having children, and being a student in round 1 (t=1).

5.4 Explanatory variables

As recent literature suggests, there may exist difference in transition probabilities of temporary employees to permanent positions based on diversity in the type of temporary employment (Berglund et al., 2017; Fuller & Stecy-Hildebrandt, 2015). Therefore, in our analysis we want to observe the difference in the transitions of temporary employees based on heterogeneity of their employment type. In this section, we will describe two sets of explanatory variables. The first set of variables capture the distinct characteristics that different types of temporary employments can have. The second set of explanatory variables are aimed at controlling for individual characteristics.

In order to address the heterogeneity component of temporary employees we have included as primary variables of interest, the contract type of temporary employment, employment sector, full-time or part-time work, and whether the employee is working long term for the same company as part of our analysis. We want to investigate whether there are significant variations in transitions to permanent employment if individuals work as substitutes, probationary employees, project employees, trainees, or as extra help. Furthermore, we want to analyse differences in transitions for temporary employees based on which sector they work

in (private, state, or municipal administrations), whether they work part-time or full-time, and whether they have worked in the same company for more than a year.

The explanatory variables which describe individual characteristics of the participants of the labour force survey and serve as control variables are gender, age, educational background, student status, civil status, and having children. These variables vary largely from one individual to another in our sample. Thus, including them in the model assists in making the coefficients in our model more precise. Furthermore, to control for external shocks and seasonal variation on transition probabilities over the years and quarters, we have also added dummy variables for the years and quarters individually in the regressions.

In order to make our analysis more meaningful, we have grouped the data on the aforementioned variables from the AKU panel data sets. Since we have adjusted them as per the need of our analysis, they require more explanation in the coming section where we first explain the variables which capture the heterogenous aspect of temporary employment followed by the explanation of the control variables. Furthermore, we also make some ex-ante predictions of the possible effects that these variables can have.

5.4.1 Employment related variables

Contract type: From the descriptive analysis we observe that the largest number of temporary employees work as substitutes followed by temporary employment as extra help. This variable distinguishes the heterogeneity in temporary employment as it categorises the different temporary contracts into substitutes, project employees, extra help, trainees, probation contracts, people in labour market measure, and other. This variable is of key interest for our analysis which addresses *research question 1* in our thesis. We assume that employees on probation are the ones who are most likely to transition relative to other groups as the nature of this type of contracts is usually to hire someone to assess their skills, and given that they perform well they are likely to be hired permanently as opposed to someone who works as a substitute for example who most likely works when someone is on leave and the nature of the temporary contract is such that it may not lead to permanent employment in the future. Due to these basic differences in the nature of the temporary contracts, we anticipate there to be significant differences in transitions to various employment statuses.

Sector of employment: From the international research (Berglund et al., 2017; Fontaine et al., 2020; Stecy-Hildebrandt et al., 2019), we know that temporary employment is more persistent in the public sector and public sector employees are less likely to transition to permanent employment but to stay on temporary employment than their private sector counterparts. Hence, we assume to find in Norway that public sector workers are more likely to stay in temporary employment than to transition to permanent employment than their peers in the private sector.

Full-time or part-time work: According to the descriptive statistics, we see that half of temporary employees work full-time, but one third work short part-time (less than 20 hours per week). Assuming longer working hours indicate employer's more permanent need for labour, we assume that the ones in full-time positions are more likely to transition to permanent position than the ones in short part-time.

Working for the same employer for more than a year: According the Norwegian legislation, individuals having worked as a temporary employee for the same employer performing same tasks for three consecutive years should then be considered as permanently employed. Additionally, longer employment helps employer to screen the employee as the longer one has worked for the same company, the better understanding employer has of one's skills and the more willing the employer is to offer suitable employees permanent contracts. Hence, we assume that individuals who have been working for the same company for more than a year are more likely to transition to permanent employment than individuals who have worked for the same employer for a shorter period.

5.4.2 Demographic controls

Student: Many students in higher education work alongside their studies as temporary employees and the transitions of students should be different as students do not necessarily aim for transitioning to a permanent position as the positions they hold as temporary employees are to gain experience and earn income while studying and not necessarily something they aim to continue after graduation. Hence, transition probabilities of students in higher education to non-students will be compared in the analysis.

Since there is not a variable in AKU that indicates that one is a student in tertiary education, dummy variable for students is built on information based on other variables. Variable V073 measures whether one has been in some type of education (school or any other educational institution) or training in the past four weeks. Hence, it includes a wider selection of people that have been in some sort of education and can be used as a base for a dummy for students at higher education. Who is included in the student dummy is further narrowed down and the dummy takes a value of 1 when one has a value of 1 in question V073, one is 24 years old or younger, and one has academic high school (videregående) or a bachelor's degree as their base education.

These choices are made because in Norway, most students enter higher education when they are 19 or 20 years old, and 37.8% of the 19-24-year-olds were in higher education in 2019 compared with 16.7% of the 25–29-year-olds (Statistics Norway, 2021a, 2021c). Hence, the closer young adults are of 20, the more likely they are to be in tertiary education and the cut-off point for age is chosen to be 24 or younger. Additionally, since many continue directly after bachelor's to master studies, the educational base is set to be either academic high school or bachelor's degree for the one's at their master studies. How the student dummy is built now captures the most typical higher education students: the ones who after high school continue in higher education. The dummy excludes older students, but that is reasonable since their transitions may be different as they already have more work experience compared to their young peers and being a student is not necessarily a main activity for them since they may study alongside their work career. However, for the younger students who enter higher education after completing high school, being a student is their main activity and these are the people we want to include in the dummy.

Students are expected to have lower transition probabilities to permanent employment and higher transition probabilities on temporary employment since the positions they hold as students are more temporal by nature and many, after graduation, change their field from the student job to the actual field they studied.

Gender: From the descriptive statistics in the previous section, it is evident that more women than men are temporarily employed. There are many underlying reasons that can explain this variation. One reason is that more women work in the public sector where temporary

employment is used more. Another could be that women experience more breaks in their careers as opposed to men due to maternity leaves. It could also be the case that women prefer to have temporary employment to balance their family life and careers. To control for variation in transition probabilities due to such circumstances, we include a dummy variable for gender as a control variable in our model. We expect that the transition probability from temporary to permanent employment to be lower for women than for men.

Age: For individuals participating in AKU survey, the age range is between 15 to 75 years old. For our analysis, we have divided this range into ranges of 15-24, 25-34, 35-44, 45-54, 55-64, and 65-75 years old and created a categorical variable for age. As evident from the summary statistics, majority of temporarily employed are young individuals, while majority of the permanently employed are middle-aged. Hence, middle-aged employees have more stable employment contracts than the youngest age group. Therefore, we have reason to that probability of transitions from temporary employment to permanent employment is higher for older/ middle-aged individuals than it is for younger individuals and so we have divided the range of age in the method above.

Educational background: Educational background measures individuals highest level of education, and we have condensed the original eight levels into three levels of education which are 'Primary education', 'Secondary education' and 'Bachelor or higher'. 'Primary education' includes all categories before secondary education, 'Secondary education' includes two levels of high school and vocational school/ technical education, and 'Bachelor or higher' includes bachelor, master, or research as the highest level of education. We expect that with higher educational background one's likelihood to transition from temporary to permanent employment increases.

Civil status: We assume that an individual's civil status is correlated with the probability of transitions to permanent employment. In the AKU panel data, the variable civil status has four categories namely 'Unmarried', 'Married/ registered partner', 'Cohabitation', and 'Engaged'. We believe that there is very little difference in transitions in employment statuses between the latter categories as they all represent stable relationships. Hence, we have grouped the civil statuses of 'Married/ registered partner', 'Cohabitation', and 'Engaged' into one status of 'Married or equivalent'. Therefore, the civil status variable in our analysis has only two

categories namely ‘Unmarried’ and ‘Married or equivalent’. From the summary statistics we can see that a larger number of permanently employed individuals have a civil status of being married or equivalent, while a larger number of temporary employees are unmarried. This implies that individuals who in a stable relationship are more likely to have a stable employment and, therefore, we expect the probability of transitioning to permanent employment to be higher for the ones in a stable relationship.

Having children: In our analysis, we have attributed the number of children to be represented as a categorical variable which states whether the individuals have children or not. We observe from the summary statistics that roughly one fifth of the individuals in each employment status have children. However, majority of the individuals do not have children. We assume that temporary employees who have children may have focus more on family life than on working full-time and, therefore, we expect the probability of transitioning to permanent employment to be lower for the ones with children.

5.5 Policy Analysis

In this section, we will present *Model 2* that will analyse the impact of the 2015 policy change. We have utilized quarterly data from Statistics Norway (2021b), and it measures the total number of temporary employees from 2006 quarter 1 to 2020 quarter 1 in Norway[3]. The data distinguishes between the different contract types. As the legislation change became effective on 1.7.2015, quarter 3 on 2015 is the first time-point that is affected by the policy. We have constructed a dummy variable called *policy* based on this timing of the policy change. Hence, all quarters before quarter 3 2015 are grouped into the control and all quarters including and after quarter 3 2015 are grouped into the treatment group.

[3] Further quarters of 2020 are excluded in order to exclude the effect of corona on employment

In order to analyse whether the policy change did in fact affect the use of temporary contracts, we used total number of contracts per quarter as an indicator. We then tested *Model 2* having the following functional form:

$$Contracts_t = \mu_0 + \mu_1 policy + e_t$$

Where,

- $Contracts_t$ is the dependent variable measuring the total number of temporary contracts each quarter.
- $policy$ is a dummy variable which takes the value of 1 is the number of contracts are being measured after the policy change and 0 otherwise.

Furthermore, since the number of temporary contracts in Norway has been rather stable over the years, we suspect that the policy may not have affected the overall number of temporary contracts in Norway, but rather certain temporary contract types may or may not have experienced an increase in the use of the contracts. Hence, we tested the aforementioned model, but with sampling based on the temporary contract type namely, substitutes, project employees, internships and extra help.

6. Results

6.1 The effect of the policy change

Research question 3 asks about the effect of the 2015 policy change on the use of temporary employment in Norway, and our hypothesis is that the liberalization of the legislation concerning temporary employment contracts has increased the use of the temporary contracts. This hypothesis is tested with regression analysis on whether the total number of temporary contracts has changed after the policy being effective. The second hypothesis is that the policy has affected the subgroups within the temporarily employed based on their contract type differently assuming that the use of screening type of contracts has increased while seasonal employment has stayed at the same level. This is tested with regression analysis on whether there is a change in the number of contracts in each contract type after the policy being effective.

Table 5 below presents the findings of the regression analysis. The number of temporary contracts regressed is presented in thousands.

Table 5 Regressing the policy on total number temporary contracts and its subgroups in Norway

Policy effect on temporary contracts

	Dependent variable:				
	Total	Substitute	Project employee	Extra help	Internship
	(1)	(2)	(3)	(4)	(5)
Policy	7.000	4.605*	-3.500***	0.947	2.421***
	(4.435)	(2.383)	(0.977)	(2.522)	(0.690)
Constant	200.632***	81.342***	37.132***	45.316***	16.368***
	(2.561)	(1.376)	(0.564)	(1.456)	(0.399)
Observations	57	57	57	57	57
R^2	0.043	0.064	0.189	0.003	0.183
Residual Std. Error (df = 55)	15.784	8.483	3.477	8.975	2.457
F Statistic (df = 1; 55)	2.491	3.733*	12.838***	0.141	12.300***

Note: *p<0.1; **p<0.05; ***p<0.01

Number of temporary contracts presented in thousands

Based on regression 1, the policy change has not affected the total number of temporary employees. There is no statistically significant difference found in the number of temporary contracts before and after the policy change. However, when running the analysis with the different contract types, there are differences in the subgroups in terms of the total number of the contracts used before and after the policy. After the policy becoming effective on 1.7.2015, the number of project employees has decreased by 3 500 people (regression 3) and the number of people on internships has increased by 2 421 (regression 5), and these findings are statistically significant at 1% level. Extra help (regression 4), which covers all types of seasonal and on-call employment, has not been affected by the policy since the groups before and after the policy do not differ in terms of the number of contracts used.

Concluding from the regression results, we cannot find that the change in legislation has affected the number of temporary contracts used in Norway at aggregate level. The policy did not change the legislation on temporary employment drastically but increased the maximum duration of the contracts. Overall, Norwegian employers had already set ways for the use of temporary employment and the policy change did not affect that. This is contrary to what we assumed in hypothesis 3.

Altogether, the results are in line with the hypothesis 4, and that there are only certain subgroups that should be affected by the policy, and those are the ones who are offered temporary employment as a screening device (Fuller & Stecy-Hildebrandt, 2015; Gash, 2008; Masui, 2020), and not those whose employment is temporary because for the employer, that flexibility acts as a buffer to changing economic fluctuations (Gash, 2008; Masui, 2020). The regression results confirm that the policy did not affect seasonal workers, which is in accordance with our hypothesis since the policy change should not affect how the employers use these types of contracts as seasonal work is used for its flexibility, not as a screening device. In accordance with Berglund et al. (2017), the use of internships has increased since now employers can screen the employees for a longer period before deciding whether to offer them permanent position. However, the use of project employees could have gone either way. Now as the numbers have decreased after the policy change, it seems that the Norwegian employers have not needed the flexibility of hiring project employees on temporary basis. They do not need to use temporary employees as a buffer, and after the policy, less employees

are hired as project employees. Maybe this indicates that the employees have moved to hiring on other contract types or overall, they have decreased the use of project employees.

When discussing the validity of the analysis, it should be noted that policy change is not the only reason that could have affected the number of temporary contracts used and other reasons could be accounted for. For example, the 2014 oil price shock that affected the employment in Norway especially in the oil-dependent regions in the West coast coincides with the policy change. As both can influence the number of temporary employment contracts used, in further research the effect of the oil shock should be controlled for.

Overall, we conclude that the policy change has not affected the use of temporary employment at an aggregate level, while some subgroups within the temporary employees are affected. In this thesis, we will further study the heterogeneity of the temporarily employed in Norway. Studying this heterogeneity of the temporarily employed in Norway will help to understand the employment and career trajectories of different types of temporarily employed individuals in Norway and build a base for further research. For example, the analysis of heterogeneity of the transitions of different subgroups that will be studied next could be built further by studying the effect of the policy change on transitions of different subgroups of temporarily employed in Norway.

6.2 The impact of heterogeneity on transitions

Following from Table 6 below, in this section we will now interpret the transitions to permanent employment, remaining in temporary employment and transitioning to unemployment in light of *Research question 1* and *Research question 2*.

Table 6 Regression analysis of transitions of the temporarily employed

Temporary employees - transitions with LPM

	Dependent variable:		
	Permanent employment in round 8	Temporary employment in round 8	Unemployment in round 8
	(1)	(2)	(3)
Contract type: Project employee	-0.006	0.007	-0.0002
	(0.017)	(0.016)	(0.006)
Extra help	-0.014	0.005	0.008
	(0.018)	(0.018)	(0.007)
Trainee	0.033	-0.067***	0.034***
	(0.023)	(0.022)	(0.009)
Probation	0.128***	-0.114***	-0.013
	(0.039)	(0.037)	(0.014)
Labour market measure	0.062	-0.115	0.053
	(0.090)	(0.086)	(0.034)
Other	0.019	-0.010	-0.009
	(0.028)	(0.027)	(0.010)
Sector: State administration	-0.073***	0.091***	-0.018***
	(0.018)	(0.017)	(0.007)
Municipal administration	-0.051***	0.063***	-0.012**
	(0.015)	(0.014)	(0.006)
County municipal administration	-0.079**	0.090***	-0.011
	(0.036)	(0.034)	(0.013)
Working hours: Long part-time	-0.003	0.005	-0.002
	(0.016)	(0.016)	(0.006)
Short part-time	-0.032*	0.031*	0.0003
	(0.017)	(0.016)	(0.006)
Working for the same company for more than 1 year: Yes	0.022*	-0.015	-0.007
	(0.012)	(0.012)	(0.005)
Education: Primary	-0.030*	0.032*	-0.001
	(0.017)	(0.017)	(0.006)
Education: Bachelor or higher	-0.007	0.018	-0.011*
	(0.015)	(0.015)	(0.006)
Student: Yes	-0.046*	0.053**	-0.007
	(0.027)	(0.026)	(0.010)
Age: 25-34	-0.021	-0.011	0.032***

Temporary employees - transitions with LPM

	Dependent variable:		
	Permanent employment in round 8	Temporary employment in round 8	Unemployment in round 8
	(1)	(2)	(3)
	(0.020)	(0.019)	(0.007)
Age: 35-44	0.005	-0.029	0.023***
	(0.023)	(0.022)	(0.009)
Age: 45-54	-0.017	-0.021	0.038***
	(0.026)	(0.024)	(0.010)
Age: 55-64	0.024	-0.049	0.024**
	(0.032)	(0.030)	(0.012)
Age: 65-75	-0.076	0.081*	-0.004
	(0.048)	(0.046)	(0.018)
Sex: Female	-0.007	0.011	-0.004
	(0.014)	(0.014)	(0.005)
Marital Status: Married or equivalent	0.041***	-0.034**	-0.007
	(0.015)	(0.015)	(0.006)
Has children: Yes	-0.009	0.010	-0.001
	(0.018)	(0.018)	(0.007)
Constant	0.807***	0.181***	0.012
	(0.030)	(0.028)	(0.011)
Year	Yes	Yes	Yes
Quarter	Yes	Yes	Yes
Observations	5,400	5,400	5,400
R^2	0.018	0.024	0.016
Residual Std. Error (df = 5361)	0.427	0.409	0.160
F Statistic (df = 38; 5361)	2.648***	3.489***	2.326***
Note:			*p**p***p<0.01

Research question 1 deals with whether people with different types of temporary employment contracts have dissimilar transition probabilities to permanent employment, temporary employment, and unemployment after a two-year interval in Norway. The hypothesis was that individuals with a temporary contract of a more permanent nature for example employees on probation contract (a trial period) are more likely to transition as opposed to temporary

employment of more temporary nature for example seasonal workers. The results we observe now are in accordance with this hypothesis. As substitutes are the most common contract type among the temporarily employed, that has been selected as the reference category. Holding substitutes as the reference category and controlling for given employment and demographic characteristics of an individual, we observe that employees with temporary probationary contract are more likely to transition to permanent employment at the end of two years. Individuals who are on probationary temporary contracts have a 12.8% higher probability than substitutes and this result is statistically significant at 1% level. These results are akin to the research outcomes from the study conducted by Berglund et al. (2017) in Sweden, where they found evidence that compared to substitutes, probationary employees have twice as high odds for transitioning to permanent employment. Our findings also highlight that probationary employment contracts work as a screening device for employers in Norway as well. Even though only a small number of temporarily employed have a probationary contract, we believe that these findings are still relevant as probationary workers are the ones to transition to permanent employment. However, for employees with other types of temporary contracts, such a being project employee, extra help or trainee, do not have statistically significant different probability of transitions relative to substitutes.

Alongside studying transitions to permanent employment, we also tested whether remaining temporarily employed differ by the type of employment contract and sector of employment. We observe that among the different types of temporary employed individuals, trainees have 6.7% lower probability of remaining on temporary employment relative to substitutes. This may be the case as duration for this type of employment contracts is rather short lived relative to substitutes. Moreover, probationary employees have 11.4% lower probability of remaining temporarily employed relative to the reference category of substitutes. This is again in line with what we anticipated in *hypothesis 1* that temporary employees like probationary employees that have a more permanent status are more likely to transition to permanent employment and thereby less likely to remain in temporary employment at the end of two years. These outcomes are significant at 1%.

Besides studying probabilities of transitioning to permanent employment and remaining in temporary employment, in our analysis we have also delved into transitions from temporary employment to unemployment and how the heterogeneity in the type of temporary

employment might play a role in this type of transitions. From our results, we can see that relative to the reference category of substitutes, trainees have 3.4% higher probability of being unemployed at the end of 2 years. This result is significant at 1% level. A possible explanation for this is that trainees are most likely young people who may transition to school or to unemployment if they do not stay employed.

Overall, the results from the three transitions highlight that the heterogeneity in the type of temporary employment does matter and has significant influence on the likelihood of transitioning to permanent employment, remaining on temporary employment and transitioning to unemployment. Furthermore, our results also lay evidence for the stepping stone hypothesis specially for the employees with probationary contract as type of temporary employment. This result is consistent with what Engebretsen et al. (2012) have found which states that temporary employment contracts work as stepping stones to permanent employment in Norway. Therefore, at least for the ones with the probationary temporary employment, the stepping stone effect is eminent according to our results which resonate with the existing literature.

Research question 2 addresses whether public and private sector employees differ in terms of transition probabilities to permanent employment, temporary employment, or unemployment after a two-year interval in Norway. Initial hypothesis was that public sector employees are less likely to transition to permanent employment. Our results are consistent with this hypothesis as we find that relative to the private sector, the public sector does indeed have lower chances of transitioning to permanent employment. We find that the temporary employees working in the state administration, municipality administration, and county municipality administration have 7.3%, 5.1% and 7.9% lower probability respectively relative to the private sector temporary employees. These results are statistically significant at 1%. County municipality administration only covers a small number of temporarily employed so there is a risk for results being biased.

Likewise, the likelihoods of transitions to permanent employment, the likelihood of being in temporary employment at the end of two years also differ by the sector. We find that individuals that are temporary employed in the public sector are more likely to remain in temporary employment at the end of the two-year period in comparison to temporary

employees in the private sector. We find that temporary employees working in the state administration, municipal administration, and county municipal administration are associated with 9.1%, 6.3%, 9% higher probability respectively, of remaining in temporary employment which is significant at 1% level. This aligns with *hypothesis 2* that individuals in the private sector are more likely to transition to permanent employment relatively temporary employees. These findings, also highlight that the repeated use of temporary contracts is more prevalent in the public sector relative to private sector as individuals on temporary employment fail to transition out of it. A saliant implication of this finding is that the public sector most likely makes use of the feature that according to the labour law, individuals can be employed on a temporary employment contract for a maximum of three consecutive years. Therefore, in a way, our findings suggest that the public sector takes advantage of this possibility to offer the same employee temporary contracts on consecutive years more than the private sector. This discovery brings forth that in Norway, temporary employment is persistently used specially in the public sector and transition to permanent are more difficult which is in line with international findings (Berglund et al., 2017; Fontaine et al., 2020; Stecy-Hildebrandt et al., 2019). This finding, also highlights that temporary employees in the public sector of Norway are more exposed to having entrapment trajectories (Booth et al., 2002; Gash, 2008).

Furthermore, with transitions to unemployment, we also observe divulging impacts between public and private sector. We observe that, temporary employees in state administration and municipal administration and have 1.8%, and 1.2% lower probabilities respectively of transitioning to unemployment at the end of two years relative to the base category of temporary employees in the private sector. Hence, on the bright side, our results also highlight that temporary employee in the public sector are also less likely to slip into unemployment relative to the private sector. Therefore, in tandem to what Svalund (2013) and Berglund et al. (2017) have found, our results signal that temporary employment in the state and municipal administration to be more secure with a lower likelihood of transitioning to unemployment. Furthermore, our results for temporary workers in public sector are thus then aligned with Rasmussen et al. (2019) who have affirmed that job insecurity associated with temporary employment is relatively low in Norway.

Moreover, we find that temporary employees working short part-time (less than 20 hours per week) have 3.2% lower probability of being permanent employees after 2 years relative to

full-time temporary employees. This result is in harmony with what Fauser (2020) propounded in Germany and McVicar et al. (2019) in Australia, who also suggest individuals on full-time temporary employment are more likely transition to permanent employment. We also find that short-time temporary employment is associated with having a 3.1% higher probability of remaining temporarily employed. Both results are significant at 10% level. Most likely employers' need for labour of the ones working full-time is stronger, and, hence, the transition to permanent employment of full-time employees is more likely than for the ones working shorter part-time hours. Similarly, the short part-time hours could indicate that the need for labour is more temporary by nature and, hence, employees working shorter part-time hours remain temporary.

For the ones who have worked for the same employer for more than a year, the likelihood to transition to permanent employment goes up by 2.2%. This is significant at 10% level. This is accordance with the screening hypothesis (Fuller & Stecy-Hildebrandt, 2015; Gash, 2008; Masui, 2020), as the longer one works for the same employer, the better understanding the employer has of one's skills and the more prone they are to offer one a permanent position. This is also in accordance with the Norwegian legislation as after three years of working in the same position for the same employer, one should be offered a permanent position. Therefore, the years working for the same employer should go hand in hand with an increased likelihood of transitioning to a permanent position.

The findings also show that relative to temporarily employed individuals with secondary (high school or vocational school) education, individuals with just primary education are associated with a 3% lower probability of transitioning to permanent employment (significant at 10% level). We find this to be consistent with Berglund et al. (2017). Their study distinguishes that relative to tertiary education, temporary employees with just primary education have lower odds of transitioning to permanent employment. Although our base category is temporary employees with secondary education, the implication for both in our case and for Berglund et al. (2017) is that the individuals with just primary education are the least advantaged due to lower transitional probabilities. This inference is strengthened by our findings from probabilities of remaining temporarily employed and transitioning to unemployment. We observe that individuals with primary education are linked to have 3.2% higher probability of remaining in temporary employment as opposed to the reference category of temporary

employees with secondary education. Furthermore, we also find that relative to temporary employees with just secondary education, individuals with bachelor or higher education are 1.1% less likely to transition to unemployment. Both results are significant at 10% level. The findings are reasonable as higher education is linked with the skill level and, thus, individuals with bachelor or higher level of education have more options in the labour market and it makes it less likely for them to be unemployed relative to temporary employees with just secondary education.

In our analysis, it is noteworthy to mention that being a student in higher education makes the transition to permanent employment less likely. Being a student decreases the likelihood by 4.6% (10% significance). Moreover, we observe that being a student in higher education is also associated to having 5.3% higher probability of remaining temporarily employed at the end of two years. This result is statistically significant at 5% level. This captures the nature of student employment. Many work alongside their studies and their main activity is being a student. Hence, they do not necessarily even seek to transition to permanent employment but work temporarily on the side while finishing their degrees. For students we found that temporary employment does not act as a stepping stone to permanent. This is a key finding which is consistent with Engebretsen et al. (2012) and Svalund and Nielsen (2017), who have previously found that in Norway that young individuals in the age group consisting of the student population (age group of 20-24) on temporary contracts do not benefit from being temporary employment and that the spring-board effect is the weakest for the young.

Furthermore, we find that civil status has an association with transitions to permanent employment. Our results indicate that relative to single/ unmarried individual, people having a civil status of married or equivalent are associated with a 4.1% higher chance (1% significance) of transitioning to permanent employment. Moreover, temporary employed individuals with a civil status of married or equivalent are attributed to having 3.4% lower probability (5% significance) of remaining a temporary employee as opposed to the reference category of temporary employees that are single. This can be due to that overall, the ones in permanent relationships are in more stable life situations and seek for more permanent employment than the ones not.

In our study, we observe that control variables age, gender, and having children do not have statistically significant influence on the transitions from temporary to permanent employment. For the case of remaining in temporary employment, working in a company longer than one year, gender or having children seem to have no statistically significant relationship with its likelihood. This implies that belonging to different age groups or having children have no correlation to transition probabilities as well. Moreover, this also implies that men and women in temporary employment do not have statistically different probabilities of transitioning to permanent employment after two years in Norway. This is in accordance with Engebretsen et al. (2012) who also found the difference in transitions between men and women to be statistically insignificant. Even though we did not find results at general level, for further research one could study whether having young children (pre-school aged), the interaction of being a woman and having young children has an effect of the career transitions. This could better capture whether being a parent with young children affects one's career preferences and transitions.

Even though age does not matter for transitions to permanent, for the case of remaining in temporary employment, we observe that, relative to the age group of 14-24, age group of 64-75 are associated with 8.1% higher probability for remaining in temporary employment. Hence, it seems that people in the retirement age take extra work and work as temporary employees. Age matters in the transitions to unemployment as well. We observe that age groups 25-34, 35-44, 45-54, and 55-64 all have 3.2%, 2.3%, 3.8%, and 2.4% higher probability of being unemployed relative to the base category of individuals in the age group of 15-24. We observe this to be the case as most likely individuals in the age category of 15-24 are most likely transition to education than unemployment or maybe they are not as active to register themselves as unemployed if they get financial support from their families. Hence, we observe all other working age groups except 15-24 are associated with higher probabilities of transitioning to unemployment.

6.3 Robustness

In this section we present a comparison of estimating our model with linear probability model and logit model as depicted by *Table A4 Robustness Table 1*. We further present a second robustness check with the comparison of a restricted version of our model with LPM and fixed

effects as shown in *Table A5 Robustness Table 2*. Both *Table A4 Robustness Table 1* and *Table A5 Robustness Table 2* can be found in the Appendix. We perform these tests to analyse whether different estimation techniques lead to diverging results.

From the comparison between the LPM and logistic regression in *Robustness table 1* we observe that similar to the LPM, the logistic regression is also consistent with *hypothesis 1* and *hypothesis 2* and it leads to similar conclusions. From the logistic regression we observe that the direction of transitions highlights that the individuals with probation as type of temporary employment contract are more likely to end up in a permanent position at the end of two years relative to substitutes. Furthermore, we also observe that temporary employees in the public sector are less likely to transition to permanent employment relative to temporary employees in the private sector. Moreover, we find that as with LPM in the logistic regressions, the control variables age, education, and having children do not have statistically significant influence over the probability of transitioning from temporary to permanent employment after two years. Therefore, we can conclude that qualitatively both LPM and logit lead to similar inferences and predictions for our research question and hypothesis. Thus, we believe that our results which highlight the higher likelihood transitions from probationary employment contracts to permanent employment and higher likelihood of transitions in the private sector as opposed to public sector to be robust to a considerable degree.

In the comparison of LPM and fixed effects panel regression in *Robustness table 2* a restricted version of the equation from *section 5.3* has been used where the model only focuses on variation in employment sector along with other employment and demographic controls mentioned in *section 5.4*. The contract type is excluded as the in the fixed effect model we study the transitions in timepoints 1 and 8, and the temporary contract type is a variable that is not coinciding with the transition end-states. The sample is selected so that everyone has a temporary contract type in round 1, but for the ones who transition to permanent employment or to unemployment temporary contract type is not registered as their labour market status is now different and on the timepoint 8 these individuals are not supposed to have a temporary employment contract and, therefore, have a missing value in the variable.

Overall, we observe for that the coefficients of temporary employees in state, municipality and county administration in the fixed effects regression have different magnitudes but the same

sign as the ones in LPM. Therefore, qualitatively, both the models imply the same that relative to the private sector, individuals in the public sector are less likely to transition to permanent employment. However, the impact of having short part-time working hours in the fixed effects model is not consistent with the LPM model. Rather in the fixed effects model we observe that the ones with long part-time working hours are less likely to transition to permanent employment relative to full time temporary employment. This result seems counterintuitive as one would assume long part-time to have similar transitions as full-time temporary employees because qualitatively, they are quite similar in terms characteristics and the need for labour. Moreover, in the fixed effects model, the impact of being a student and working for the same employer for over one year becomes statistically insignificant. However, the results for short part-time working hours, working for the same company over one year and being a student in the LPM model are consistent with existing literature as explained in *section 6.2*. Therefore, despite a few diverging conclusions between the two models, in the key variables of interest, the models showed similar results qualitatively, and, thus, we believe that results found with the LPM to be robust.

7. Limitations

Although our study accentuates findings relevant for understanding the Norwegian labour market, these finding should be accepted in the light of certain limitations. Availability of data has restricted our choice in modelling and, if the data allows, when studying heterogeneity and transitions of different types of temporarily employed further, these aspects can be taken into consideration. The length for how long one has had the temporarily employment contract should be controlled for. We now observe when one enters the labour force survey and consider them temporarily employed based on that, but not when they have initially started the temporary employment. However, the length for how long they have been temporarily employed should have an effect for the transition likelihoods. Furthermore, if data allows, one's prior work experience should be controlled for as the varying levels of work experience also affect individuals' likelihoods of transitioning to permanent employment, remaining temporarily employed or transitioning to unemployment. Furthermore, the length of different type of temporary contracts should be accounted for as, for example, the length of a temporary contract for substitutes might significantly differ from the length of a temporary employment contract for project employees. These can potentially contribute to differences in transitional probabilities. Moreover, sequence analysis could be conducted in Norway, and to study multiple changes in labour market status of temporarily employed in order to see how the changing statuses affect the transition likelihoods. Alternatively, now the status is observed for only the first and last timepoint in the survey, but one could even with the two timepoint model study whether there had been changes in the status and add the changes in model in order to see the difference between individuals who within the two years have many changes in their labour market status or many different temporary employment contracts and the ones who do not. Furthermore, by selecting only individuals with a temporary employment status on the first measuring point of the survey, we implicitly only observe the individuals who have a positive labour market association already and have a temporary employment contract. Most likely, we do not observe the ones in entrapment career trajectory if they were not temporarily employed but unemployed when the survey started. Thus, a potential limitation associated to our study is the possibility of having selection biases and we may underestimate the negative effects of the temporary employment. As we use panel data of individuals who have completed all eight interview rounds, these individuals could be in relatively stable positions in their lives

as the interviewer has managed to reach them for eight times, and, hence, we can have upward bias in the results concerning transitions of temporarily employed if we are missing individuals in more scarring employment cycles. Additionally, the sample we have now is constructed so that we measure labour market status at measuring point 1 and 8. This means that we analyse the individuals who stay in the labour force, and those who exit the labour force are excluded from the analysis as we only study the end state in round 8 to be either employed or unemployed. Thus, in a way, we only manage to capture partial reality of the role of temporary employment and maybe underestimate the precarious effect temporary employment contracts can have on careers of marginalized individuals. The role of the temporary employment for individuals leaving the labour market should be studied and sequence analysis that shows the multiple transitions is a valid tool to study it as it shows from which type of pattern one transitions outside of the labour force, from unemployment or for example after multiple temporary employment contracts.

8. Discussion and conclusion

In this thesis, we have investigated how vast differences in the use of temporary contracts can affect careers of individuals that are temporarily employed. We have identified temporary employees not as a single group with similar characteristics but rather a group of individuals that substantially differ from one another based on the type of employment contract they have, their sector of employment, and other employment and demographic characteristics. Specially, with the type of employment contract, we have attempted to capture employer's motive that may play a role in the development of the career of the temporarily employed individual. Furthermore, by differentiating the sector of employment, we endeavoured to capture the institutional differences in use of the labour laws across sectors. Based on these heterogenous components of temporary employment, we have assessed the labour market status of individuals that are temporarily employed after close to two years. Using LPM, we have studied the likelihood of transitions to permanent employment, remaining in temporary employment and then transitions to unemployment for this heterogenous group of temporary employees.

To put matters into perspective, our results from the three transitions highlight that the heterogeneity in the type of temporary employment contract and sector of employment does indeed matter and has significant influence on the likelihood of transitioning to permanent employment, remaining on temporary employment and transitioning to unemployment in Norway. Our key findings state that temporary employees on probation are more likely to transition to permanent employment compared to substitutes at the end of two years. This shows that temporary contracts work as a stepping stone for them as the employers use the contract as a screening device to assess the skills of the hired individual and later offer them a permanent contract. However, the proportion of this type of employment is marginal in the Norwegian economy.

Furthermore, our findings highlight stark differences between the private and public sector. We find that temporarily employed in the public sector are less likely to transition to permanent employment and more likely to remain temporarily employed compared to the private sector at the end of two years. However, temporary employees in the public sector are less likely to transition to unemployment. This implies temporary employees are stuck in

temporary employment but have job security to some extent. Therefore, recurrent use of temporary employment contracts thus implies an entrapment scenario for those in the public sector. This has vast implications for working women in Norway as close to every second employed women in Norway works in the public sector. With sequence analysis, transitions of temporary employees in the public sector could be studied further. Focus should be on how temporary employment is used in the public sector, how many temporary contracts are sequenced, how long/ short the contracts used are, and how long does it take an individual to transition from temporary to permanent employment in the public sector. From the perspective of a policymaker, repeated bouts of temporary employment can mean that the demand for these individuals' labour is most likely not short-term. Additionally, the set maximum in the governmental sector for the temporary employment contract being of maximum of six months, besides the substitutes who can have longer contracts, can be reassessed as these shorter contracts create uncertainty for the individuals about the employment and income security. As the maximum duration in the governmental sector is shorter than in the private and municipal sector, it creates more employment and income security for the temporary employees in the governmental sector. Now it seems that even with the shorter maximum duration of the contract, temporary employment contracts are used more persistently in the public sector, so the employees are in even more insecure situation than their private sector counterparts. Hence, revaluating the legislation so that the sectors have the same maximum duration of a contract would decrease the inequality stemming from differences in employment and income insecurity between the sectors. Additionally, it should be evaluated whether temporary employees after performing similar tasks for three years transition to permanent employment in accordance with the legislation. As the temporary employment is found to be persistent in the public sector, there could be problems with this.

Furthermore, in policymaking, heterogeneity of temporary employees in terms of students working alongside their studies should be noted for. Through our analysis we observe that students are less likely to transition to permanent employment and to stay temporarily employment. However, even though temporary employment does not work as a stepping stone to permanent employment among students, this is not necessarily harmful for them in case they are working alongside their studies in order to earn income and gain experience. Hence, they are not necessarily disadvantaged because of being in more of an entrapment sequence than in the stepping stone sequence while being students. Another situation is if this is the case

after graduation, but while being a student the entrapment trajectory does not necessarily harm them as their main activity is not being an employee but being a student. Besides students there can be other marginal groups as well for whom continued temporary employment is an optimal end state and not trap, and permanent employment should not be treated as the only optimal end state. Hence, in policymaking, this heterogeneity of the optimal end state for the individual should be accounted for.

Lastly, in this thesis, we also investigated the impact of the policy 2015 policy change which liberalized the use of temporary contracts by increasing maximum duration of temporary contracts to 12 months. Our findings suggest that on an aggregate level, the policy did not change the total number of temporary employees in Norway. This could be because the change in policy was minor from employer perspective and most likely did not affect the employer behaviour on a mass level in Norway. On a subgroup level, the liberalization did increase the number of internships as the employers can now assess the skills of the temporarily hired interns for a longer period of time, but the liberalization did not affect the use of seasonal workers as employers use these types of contracts for its flexibility. These findings support what we found in the study of heterogeneity of employment contracts that employer motive does matter in defining whether temporary contracts are used for screening or whether they are used for the purpose of achieving flexibility.

In conclusion, we highlight that heterogeneity in the type of contract and employment sector play an active part in defining employment trajectories of the temporary employed in Norway. Our thesis has given input for the political discussion on temporary employment and put emphasis on that the heterogeneity of temporary employment as a phenomenon should be accounted for as whether temporary employment can be beneficial for the employee depends on the career trajectory. Different types of temporary contracts are more likely to lead to different type of career trajectories. Some benefit from temporary employment and use it as a stepping stone to permanent employment and some are trapped in it. This heterogeneity of temporary employment should be accounted for when setting the legislation on temporary employment, and not to treat temporary employees as one homogenous group.

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Appendix

Table A1 Columns where values outside of the column range were recoded into NA

Variable code	Variable name	Values recoded into NA
V009	Marital status	8, 9
V019	Company's ownership	9
V027	Full-time or (long / short) part-time employment	9
V032	Working continuously for the same company for over a year	8, 9
V037	Temporary contract type	8, 9
V042	Number of employees in the company	7, 8, 9
V045	Wish to work other working hours	8, 9
V046	Looked for longer working hours	8, 9
V047	Possibility of working longer hours	8, 9
V051	Reason for temporary absence from main employment	99
V073	Has taken part in education within the past month	8, 9
V084	Level of education	0, 9

Table A2 Main labour force status on round 1 for all people before further sampling

V010 code	V010 category	Total
101	Military service	297
111	Employed, employee	63 450
112	Employed, self-employed	5 151
113	Employed, family worker	291
119	Employed, unspecified	8
121	Temporary absence, employee	12 671
122	Temporary absence, self-employed	730
123	Temporary absence, family worker	37
129	Temporary absence, unspecified	1
232	Jobseeker, school student	744
233	Jobseeker, old-age retiree	18
234	Jobseeker, early retiree	12
235	Jobseeker, disabled	73
236	Jobseeker, domestic worker	71
237	Jobseeker, unemployed	1 815
239	Jobseeker, other	154
249	Jobseeker, involuntarily laid-off	27
362	Outside of the workforce, school student	9 688
363	Outside of the workforce, old-age retiree	8 863
364	Outside of the workforce, early retiree	1 909
365	Outside of the workforce, disabled	8 878
366	Outside of the workforce, domestic worker	1 464
367	Outside of the workforce, unemployed	1 391
369	Outside of the workforce, other	936
	NA	24 695

Table A3 contains descriptive statistics for the entire sample of data which we initially acquired from NSD and has been developed based on the variable *V10, Main status in the labour force*. Therefore, it contains the distribution of individuals that are employed, unemployed and out of the labour force across demographic variables namely age, education, sex, marital status, and number of children for only the first round of the interviews conducted quarterly each year from 2006 Q1 until 2018 Q1.

Table A3 Summary statistics table for all individuals in the Labour Force Survey

	Employed	**Jobseeker**	**Outside Labour force**	**N**
	N=89906	***N=3209***	***N=36105***	
Sex:				129220
Male	46873 (52.1%)	1755 (54.7%)	16787 (46.5%)	
Female	43033 (47.9%)	1454 (45.3%)	19318 (53.5%)	
Age in years:				129220
15-24	11364 (12.6%)	1229 (38.3%)	9979 (27.6%)	
25-34	17092 (19.0%)	723 (22.5%)	2657 (7.4%)	
35-44	21433 (23.8%)	573 (17.9%)	2311 (6.4%)	
45-54	21102 (23.5%)	417 (13.0%)	2857 (7.9%)	
55-64	15925 (17.7%)	226 (7.0%)	6040 (16.7%)	
65-75	2989 (3.3%)	41 (1.3%)	12259 (34.0%)	
'Missing'	1 (<0.1%)	0 (0.0%)	2 (<0.1%)	
Level of Education:				129220
Primary Education	16651 (18.5%)	1306 (40.7%)	13765 (38.1%)	
Secondary Education	39239 (43.6%)	1086 (33.8%)	14190 (39.3%)	
Bachelor or higher	33196 (36.9%)	642 (20.0%)	5499 (15.2%)	
'Missing'	820 (0.9%)	175 (5.5%)	2651 (7.3%)	
Student:				129220
Yes	1926 (2.1%)	136 (4.2%)	1657 (4.6%)	
No	87617 (97.5%)	2972 (92.6%)	32514 (90.1%)	
'Missing'	363 (0.4%)	101 (3.1%)	1934 (5.4%)	
Marital status:				129220
Unmarried	20756 (23.1%)	1683 (52.4%)	12913 (35.8%)	
Married or equivalent	69024 (76.8%)	1520 (47.4%)	22413 (62.1%)	
'Missing'	126 (0.1%)	6 (0.2%)	779 (2.2%)	
Has children:				129220
Yes	16580 (18.4%)	531 (16.5%)	2811 (7.8%)	
No	73326 (81.6%)	2678 (83.5%)	33294 (92.2%)	

Table A4 Robustness table 1: transitions of temporarily employed with LPM and logit

Robustness with LPM and logit

	Dependent variable:	
	Permanent employment in round 8	
	OLS	*logistic*
	(1)	(2)
Contract type: Project employee	-0.006	-0.036
	(0.017)	(0.090)
Extra help	-0.014	-0.075
	(0.018)	(0.098)
Trainee	0.033	0.189
	(0.023)	(0.129)
Probation	0.128***	1.011***
	(0.039)	(0.300)
Labour market measure	0.062	0.382
	(0.090)	(0.557)
Other	0.019	0.106
	(0.028)	(0.155)
Sector: State administration	-0.073***	-0.399***
	(0.018)	(0.097)
Municipal administration	-0.051***	-0.286***
	(0.015)	(0.082)
County municipal administration	-0.079**	-0.430**
	(0.036)	(0.190)
Working hours: Long part-time	-0.003	-0.019
	(0.016)	(0.091)
Short part-time	-0.032*	-0.171*
	(0.017)	(0.091)
Working for the same company for more than 1 year: Yes	0.022*	0.120*
	(0.012)	(0.067)
Education: Primary	-0.030*	-0.168*
	(0.017)	(0.096)
Education: Bachelor or higher	-0.007	-0.041
	(0.015)	(0.086)
Student: Yes	-0.046*	-0.233
	(0.027)	(0.143)
Age: 25-34	-0.021	-0.110
	(0.020)	(0.107)

Robustness with LPM and logit

	Dependent variable:	
	Permanent employment in round 8	
	OLS	*logistic*
	(1)	(2)
Age: 35-44	0.005	0.041
	(0.023)	(0.131)
Age: 45-54	-0.017	-0.090
	(0.026)	(0.141)
Age: 55-64	0.024	0.158
	(0.032)	(0.185)
Age: 65-75	-0.076	-0.395
	(0.048)	(0.248)
Sex: Female	-0.007	-0.039
	(0.014)	(0.078)
Marital Status: Married or equivalent	0.041***	0.224***
	(0.015)	(0.084)
Has children: Yes	-0.009	-0.058
	(0.018)	(0.101)
Constant	0.807***	1.426***
	(0.030)	(0.166)
Year	Yes	Yes
Quarter	Yes	Yes
Observations	5,400	5,400
R2	0.018	
Residual Std. Error	0.427 (df = 5361)	
F Statistic	2.648*** (df = 38; 5361)	
Note:	*p**p***p<0.01	

Table A5 Robustness table 2: transitions of temporarily employed with LPM and fixed effects

Robustness with LPM and fixed effects

	Dependent variable:	
	Permanent employment in round 8	
	LPM	*Fixed effects*
	(1)	(2)
Sector: State administration	-0.075***	-0.096***
	(0.018)	(0.022)
Municipal administration	-0.052***	-0.057***
	(0.015)	(0.019)
County municipal administration	-0.080**	-0.066*
	(0.036)	(0.040)
Working hours: Long part-time	-0.011	-0.035**
	(0.016)	(0.014)
Short part-time	-0.045***	-0.015
	(0.015)	(0.014)
Working for the same company for more than 1 year: Yes	0.022*	0.014
	(0.012)	(0.011)
Education: Primary	-0.026	-0.004
	(0.017)	(0.021)
Education: Bachelor or higher	-0.008	-0.035
	(0.015)	(0.026)
Student: Yes	-0.046*	-0.010
	(0.027)	(0.021)
Age: 25-34	-0.024	-0.006
	(0.019)	(0.024)
Age: 35-44	0.001	0.025
	(0.023)	(0.039)
Age: 45-54	-0.020	0.018
	(0.025)	(0.055)
Age: 55-64	0.022	0.016
	(0.031)	(0.079)
Age: 65-75	-0.082*	-0.085
	(0.048)	(0.111)
Sex: Female	-0.014	
	(0.014)	
Marital Status: Married or equivalent	0.040***	0.009

Robustness with LPM and fixed effects

	Dependent variable:	
	Permanent employment in round 8	
	LPM	*Fixed effects*
	(1)	(2)
	(0.015)	(0.016)
Has children: Yes	-0.005	-0.010
	(0.018)	(0.032)
Constant	0.822***	
	(0.028)	
Year	Yes	Yes
Quarter	Yes	Yes
Observations	5,411	13,123
R^2	0.015	0.781
Residual Std. Error	0.427 (df = 5378)	
F Statistic	2.633*** (df = 32; 5378)	575.103*** (df = 32; 5164)
Note:	*p**p***p<0.01	