

Flexible employment in The Netherlands: trends, causes and consequences

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1. Introduction

Many western European countries have experienced an increase in flexible employment relations. The Netherlands is an interesting case for studying this phenomenon, since the share of temporary employment has grown to one of the highest among OECD-countries, while other forms of flexible employment have increased as well. On-call employment, for example, has doubled over the last decade and own-account work grew by 50%. The simultaneous increase of both flexible employment contracts and own account work makes the Netherlands a specifically interesting case study.

Both policy makers and scientists have shown substantial interest in this topic. An extensive debate has evolved about the extent to which such jobs harm or improve the wellbeing of individual workers and society. Examples involve studies on the impact of the level of flexible employment relations on the level of employment, unemployment and productivity, but also the relation to stress, family formation, (mental) health and job satisfaction have been studied extensively (see Zijl 2006 and OECD 2013, 2014 for an overview).

Even though the surge in the use of temporary contracts over the last thirty years has been well documented and analysed in various cross-country studies (for example, OECD, 2002, 2004, 2013, 2014; ILO, 2012). in many countries it still remains an open question why flexible work arrangements are increasing so quickly, which groups are mostly involved and especially how these people are impacted over their life cycle. Our paper investigates the incidence of various forms of flexible work arrangements in the Netherlands since the early 2000's and analyses both the individual perspective and the types of jobs that are mostly involved. We contribute to the literature by adding a cohort perspective on the question who works on which type of arrangement, and by studying the sectoral dimension. Regarding the latter, we use longitudinal analyses to relate the share of various forms of flexible work in different sectors of industry to characteristics of these sectors, such as globalization, technological change and workers' (lack of) bargaining power.

An important note with our analysis is that we do not regard part-time employment as a form of flexible or non-standard work. In the Netherlands a quarter of all working men and three quarters of all working females are employed on a part-time basis. Part-time jobs are not only very common and covered by the same institutional arrangements as full-time jobs, but are mostly a positive choice as well (e.g. Allaart and Bellmann 2007, Visser 2002). Therefore they are not regarded as non-standard or flexible work arrangements, neither in the scientific nor in the policy debate. In this respect the Netherlands differs from many other countries.

The remainder of this paper is organized as follows. Section 2 presents the institutional features of the Dutch tax, benefits and industrial relations system and the implicit incentives in this system for employers to hire workers on flexible work arrangements. Section 3 presents data on the incidence and forms of flexible employment and how these have increased over time. Section 4 takes the individual perspective and explores the heterogeneity in the reasons to work on flexible work arrangements, the heterogeneity in the probability to work on such arrangements and the related cohort perspective. Section 5 investigates the job characteristics of flexible work arrangements, and section 6 analyses the increase of these work arrangements by taking a sectoral perspective. Section 7 concludes.

2. Institutional setting

Institutions may be an important cause for a high level of flexible employment. According to EU directive 1999/70 countries are obliged to introduce legislation aimed at restricting the use of temporary employment. They may choose between determining the reasons for which temporary employment may be renewed, restricting the maximum total duration of temporary contracts or determining the maximum number of times a temporary contract may be renewed. The Dutch legislator has chosen for a combination of the second and third option (chain regulation, see section 2.1 below). At the same time there are several institutions in the Dutch legislation that make it attractive for employers to hire people in various forms of flexible employment relations because they allow employers to circumvent costs and risks attached to open-ended contracts.

2.1 'Chains' of fixed-term employment contracts

Until 1999, fixed-term employment contracts were by law converted into open-ended contracts when the contract was prolonged or renewed within 31 days. In the period 1999-2014 the 'Wet flexibiliteit en zekerheid' (Flexibility and Security Act) determined that the fourth fixed-term contract in a row with the same employer (with less than 3 months between two consecutive contracts) was automatically converted into an open-ended contract. The same held when a series of consecutive fixed-term contracts (with less than 3 months in between) had a total length of more than three years. It was allowed to deviate from this standard by sectoral collective labor agreement, which was used frequently (Houwing 2010). From 2015 onwards, the 'Wet werk en zekerheid' (Work and Security Act) has increased the required time between two consecutive contracts to six months. When there are more than six months in between two fixed-term contracts with the same employer, the contracts are no longer considered consecutive by law, and the third contract in a row has to be an open-ended one. It is still possible to deviate from this legal standard by collective labour agreement.

2.2 Regulation that make open-ended contracts expensive

Employment protection

An important source of cost differences between flexible and open-ended contract, and possibly the key reason for the original introduction of temporary contracts, is the dismissal procedure. Displacing workers on an open-ended contract is a burdensome procedure for employers and comes with considerable costs. When displacing a worker for individual reasons, the employer has to prove in court that there is in fact a situation of low productivity, which he has tried to counteract by schooling and training the worker, or finding another job

for this worker within his organization. Only when the judge deems the displacement inevitable and according to the rules, the employer may fire the worker after paying the severance payment. This severance payment is calculated as one third of a monthly salary per year worked for the first 10 years of tenure, plus one half monthly salary for every additional year of tenure. When displacing a worker for economic reasons, the employer needs to prove at the Public Employment Office (UWV) that he followed the rules for collective dismissal. Again this test is preventive, so the proof comes before the displacement. The severance payment in case of displacement for economic reasons is the same as for individual reasons. Employers can circumvent this official route by mutual agreement with the worker. In this case, workers often bargain a higher severance pay than the one that they would receive according to the rules used in court and at the Public Employment Office (Heyma et al. 2017). These procedures can also be circumvented by hiring people on temporary contracts, as temporary agency workers or as own-account workers.

Before 2015, the period for which we have most of the data available in the remainder of this paper, severance payments were higher and employers could choose between court and the public employment office as the channel via which to displace. In this period severance payments were only applicable in court, not at the Public Employment Office. Especially small and medium sizes companies used the cheaper Public Employment Office option. Larger firms usually took the route via court, which was faster and had a higher probability that permission to displace was granted.

Wage payments during sickness

Another important institution that make flexible contracts more attractive for employers than open-ended contracts is the obligation for employers to keep sick employees on the payroll for two years, and exert considerable efforts to let them return to their job or find a new, suitable, job¹ (either within or outside the workplace) for these workers if they can no longer perform their own job, and prove in court that these obligations have been fulfilled before an employee is eligible for disability insurance.² These obligations hold irrespective of the nature and cause of the illness of the worker. For employees on a temporary contract, the obligations for the employer end with the end of the contract. Using own-account workers or agency workers safeguards an employer completely from continued payment of wages and re-integration obligations in case of sickness.

Collective labor agreements

In the Netherlands sectoral collective labor agreement (CLAs) are important for setting pay scales, fringe benefits, training obligations and pension rights. Also additional unemployment benefits or disability benefits can be part of CLAs. Since own-account workers and temporary agency workers do not fall under the CLA of the sector in which they are hired, employers can circumvent fringe benefits, pay scales and pension contributions by hiring workers on these arrangements.

¹ If the employer has no job available for the employee within his company, he has the obligation to search for another job with another employer.

² If he cannot prove in court that these effort have been made, the worker remains on the payroll for another year.

Minimum wage

The Netherlands has an extensive system of statutory minimum wages. For adults aged 23 years or older, the minimum wage is 8,96 Euro per hours worked. For younger people the minimum wage increases stepwise from 2,69 Euro per hour for 15 year olds to 7,61 Euro per hour for 22 year olds. The statutory minimum wage does not hold for own account workers, only for employees. Fixed-term contracts, on call work and temporary agency work all fall under the same minimum wage requirements. But own-account workers are free to set their own wage level, even if this level is below the statutory minimum wage. There are concerns about the pay levels of own account workers at segments of the labor market where the bargaining power of firms is strong (IBO(2015)).

Tax reductions for own-account workers

Own-account workers pay considerably lower taxes due to tax reductions that are specifically aimed at self-employed workers and small companies. On average own account workers pay 20 percent lower taxes for the same gross income, compared to employees (Bosch et al. 2015). Also, they don't pay contributions for unemployment insurance and, in contrast to employees, disability insurance and pension saving is voluntary. In practice 25% of the own account workers is insured against disability (Berkhout and Euwals 2016) and about 50% of the own account workers has pension savings at the level of employees (Ministry of Social Affairs and Employment 2013). Since a firm that hires an own account worker pays a tariff that is negotiated between the two parties, it differs whether the surplus of the lower taxes and social security premiums lands in the hands of the firm or of the own account worker. In 2015 a report by high civil servants from various ministries indicated that own account workers at the higher end of the labor market can use their bargaining power to cash those lower costs, while firms cash the tax advantages at the lower end of the labour market by negotiating low tariffs (IBO 2015). In total wage cost for a hiring firm are 30 lower if they hire someone as own account workers instead of as employee, for work at the minimum wage level, if they firm can indeed harvest all the advantageous of the lower taxes and social premium. While at a high wage level of two times the modal wage, the workers receives a 43% higher net income, if he can harvest all benefits.

3. Incidence and forms of flexible work arrangements

The Dutch Labour Force Survey (LFS) provides information on flexible work arrangements without structural breaks for the period 2003-2015. The LFS distinguishes eight types of flexible employment, of which six are different types of flexible employment contracts and two are types of own-account workers:³

- fixed-term contract with duration < 1 year
- fixed term contract with duration >= 1 year

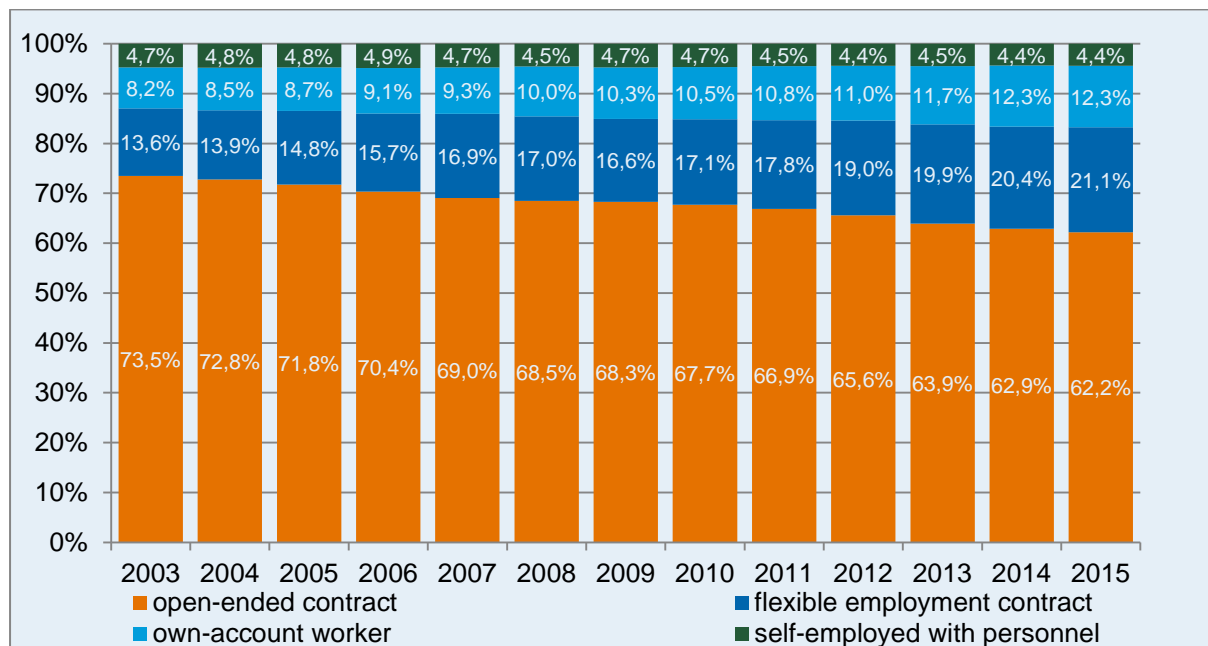
³ This distinction does not cover all types of flexible employment. From the Dutch perspective, the most important type of flexible employment that is missing is payrolling, where a payroll company takes over all responsibilities and risks from a client employer by becoming the legal employer of an employee that is de facto working for the client employer. There are no statistics available for this type of employment relation.

- fixed-term contract that will be continues as open-ended contract upon good performance⁴
- on-call employment
- employment with temp agency
- contract (either fixed-term or open-ended) without a prespecified number of hours per week
- own-account workers selling a product⁵
- own-account workers selling services/own labor

In 2015 approximately one third of all workers was employed on a flexible work arrangement. The share of workers employed on a flexible employment contract has risen from 14% to 21% in the period 2003-2015, while the share of own-account workers increased from 8% to 12% (Figure 1). This increase came entirely at the expense of open-ended employment contracts, since the share of self-employed with personnel hardly changed.

The share of workers on a flexible employment contract has grown every year, but faster in some periods than in others. The rise was fast in the periods 2004-2007 and 2012-2015 and slow in the years 2008-2011.

Figure 1 Composition of employment types as share of all workers, 2003-2015



⁴ In the LFS respondents with a fixed-term employment contract are asked whether their contract will be continued as open-ended contract upon good performance. It is a known issue that the answer given here not necessarily has a legal status. Partly it reflects own assessment of workers and/or non-written agreements between employer and employee.

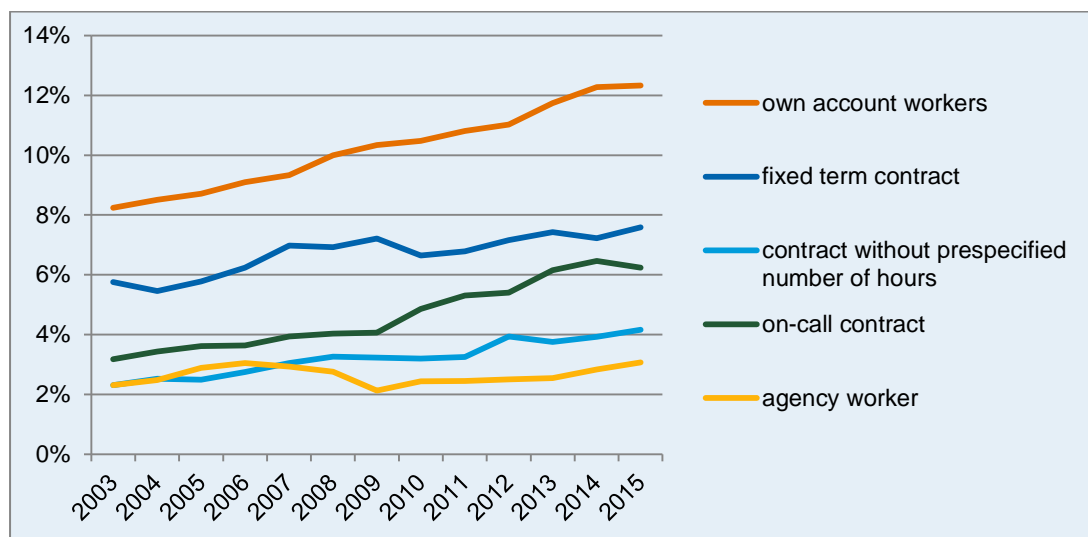
⁵ The distinction between own-account workers selling a product and own account workers select services/own labor is only available from 2012 onwards.

Own-account work is the largest subgroup among the flexible work arrangements, and it has increased at quite a constant rate over the period 2003-2015 (Figure 2). Its share increased from 8% of all workers in 2003 to 12% in 2015. The increase does not show any relation to business cycle fluctuations.

Fixed-term contracts form the second largest subgroup of flexible working arrangements (Figure 2). Its share in the total working population increased from 6% in 2003 to nearly 8% in 2015. The share of workers with a fixed-term contract fluctuates around a positive trend. When the economy is growing (periods 2003-2007 and 2013-2015), the share of workers with a fixed-term contract grows faster than in bad economic times (2001-2003 and 2007-2014). Fixed-term contracts can be broken down further into fixed-term contracts for less than one year (2% of all workers), fixed-term contracts with a duration of more than one year (2% of all workers) and fixed-term contracts that will be continued as open-ended contracts upon good performance (3% of all workers).

On-call work is catching up quickly to become the second largest subgroup of flexible working arrangements. The share of on-call contracts has doubled between 2003 and 2015 to 6.2% of all workers (18.9% of all flexible working arrangements), with alternating periods of slower and faster growth, which are not clearly related to the economic cycle. Temporary agency work fluctuates around a stable share of 3% of employment (9.2% of all flexible working arrangements in 2015). It increases when the economy is going up and decreases when the economy slows down (Berkhout and De Graaf-Zijl 2007). Employment contracts without a prespecified number of hours per week make up for 12.5% of all flexible working arrangements in 2015. The share of all workers on such a contract rose from 2,3% in 2003 to 4,2% in 2015.

Figure 2 Share of working population on different types of flexible employment contracts in period 2003-2015

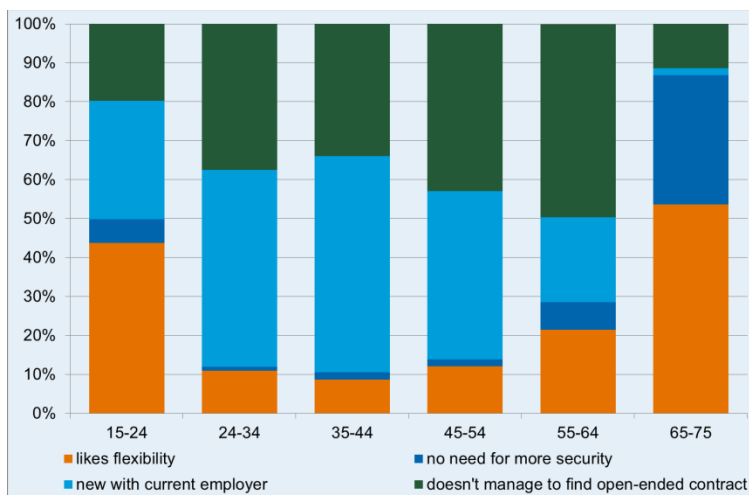


4. The individuals' perspective

4.1 Heterogeneity in the reason to work on a flexible work arrangement

Information on the reason why people work on a flexible employment contract is available from the Dutch Working conditions Survey 2015.⁶ Results indicate that flexible employment is often not a positive choice, but merely a second-best when employment on an open-ended contract is not available. On average 27% of the workers on a flexible contract indicate that they work on a flexible employment contract because they prefer the flexibility that it brings, and another 5% indicate that they have no need for more security. The remaining 68% would prefer *not* to work on a flexible employment contract but has either just started to work for their current employer and therefore is on a temporary contract (38%) or has not yet managed to find a job with an open-ended contract (30%). Beneath these average results we find large differences by age group. For both the youngest (15-24) and the oldest (65-75) age group flexible employment is often a positive choice (for respectively 50% and 87%), while for 25-54 year olds this is only the case for 11 to 14%.

Figure 3 Reason to work on flexible contract



According to Donker van Heel et al. (2013) own-account work is mostly a positive choice: 73% of current own-account workers would prefer to work as own-account worker when they had to choose again. Another 7% was indifferent between being an own-account worker and working as an employee. Hence, for one out of five working as an own-account worker is not a positive choice.

4.2 Heterogeneity in the probability to work on a flexible work arrangement

Descriptive statistics

Flexible work is not equally distributed across workers. Descriptive statistics based on the Dutch LFS-data show that there are considerable differences by gender, age, educational attainment, household situation and ethnicity (Table 1). Differences are especially

⁶ All workers on a flexible employment contract are asked for the most important reason to work on a flexible employment contract.

pronounced between age groups, but differences between educational levels and ethnic groups are substantial as well.

The age pattern differs substantially between flexible employment contracts and own account work. Of all 15 to 24 year olds that work, 65% has a flexible employment contract and 5% work as own-account worker.⁷ The higher the age, the smaller the share of flexible employment contracts, but the higher the share of own account work. After the statutory retirement age, the share of both type of flexible work arrangements increases.

Lower educated employees work twice as often in flexible employment contracts compared to high educated workers, but less often as own account workers. Differences are especially pronounced for on-call employment and employment contracts without a prespecified number of hours. Regarding ethnicity, especially 2nd generation non-western immigrants work on a flexible contract compared, but this may be related to their lower age. The latter also holds for the substantially higher probability of children living with their parents to work on flexible employment contracts,

The differences across sexes are relatively small compared to the other differences. The total share in flexible employment is comparable between men and women, but the type of flexible employment differs. Flexible employment as an employee is more prevalent among women (24% vs. 19% among men), working as own-account worker is more prevalent among men (14% vs 10%). The only type of flexible employment contracts that is more prevalent among men than among women is agency work.

⁷ The share of flexible employment contracts among 15 to 24 year olds increased considerably in the past decade, from 40% in 2003 to 65% in 2015. For 25 to 34 year olds it rose from 12% to 25%. For all other age groups and for own-account work the prevalence was quite stable over 2003-2015 (also see Figure A1 in the appendix)

Table 1 Percentage of all workers in particular subgroup with flexible employment contract and working as own account worker, 2015

	% with flexible employment contract	% own-account worker
male	19,5%	14,0%
female	23,6%	10,3%
15-24yrs	65,4%	5,3%
25-34yrs	25,1%	8,9%
35-44yrs	12,2%	11,9%
45-54yrs	8,9%	14,5%
55-64yrs	7,8%	15,9%
65-74yrs	24,4%	48,9%
low	31,7%	11,1%
middle	21,7%	11,4%
high	15,2%	14,0%
single	24,3%	13,5%
single parent	16,5%	10,6%
with partner and children	10,4%	12,6%
with partner, no children	15,9%	15,0%
with parents	62,3%	5,5%
other	41,8%	10,3%
native	20,0%	12,6%
western immigrant, 1st generation	20,7%	14,4%
western immigrant, 2nd generation	22,3%	13,6%
non-western immigrant, 1st generation	25,2%	10,4%
non-western immigrant, 2nd generation	44,4%	5,4%

Modelling the probability to have a flexible working arrangement

A pitfall of the descriptive statistics that were presented in Table 1 is that it only a breakdown on one dimension at a time, not taking into account possible correlations between gender, age, education, ethnicity and position in the household. This may lead to misinterpretation, since the higher share of flexible contracts among 2nd generation immigrants, lower educated workers or people living with their parents may partly or even completely be due to their lower age. Estimating the probability to work on a flexible contract with a multivariate linear regression model and correcting for age, gender, ethnicity, education and position in the household, allows us to isolate the effect of, for example, education from the effect of age, gender, ethnicity and position in the household. Moreover, by estimating year-specific coefficients, it is possible to detect trends in the effect of each of these variables. We therefore estimate the probability to work on a flexible employment contract or as own-account worker using a linear probability model with year specific constants and coefficients:

$$Y_{it} = \alpha_t + \beta_t X_{it} + u_{it}$$

where Y_{it} is the probability that worker i has a flexible employment contract (works as own-account worker) in year t , α_t is a year-specific constant, X_{it} is a set of characteristics for worker i in year t . X includes gender, age, educational level, ethnicity and position in the household. u_{it} is the error term.

The results of this analysis are shown in Table 2 for flexible employment contracts in 2003 and 2015 (columns 2 and 3) and own-account work in 2003 and 2015 (columns 4 and 5). The results that are shown are obtained from a sample that includes full-time students. Omitting full-time students gives similar results, except that the effect of age for 15-24 year olds is smaller (which implies that young people that are not in full-time education less often work on a flexible contract compared to those in full-time education).

Flexible employment contracts

After controlling for the correlation with other characteristics in the regression, age is clearly the most important determinant of the probability to work on a flexible employment contract, and its importance has grown over time. The difference between 15-24 year old and 25-34 year olds grew from +22% to +32%.⁸ The difference between 35-44 year olds and 25-34 year olds increased from -3% in 2003 to -11% in 2015. The pattern for workers over 45 resembles that of 35-44 year olds. The increasing differences between age groups under 45 combined with the large share of flexible contract among young people may indicate a decreased flow from flexible to open-ended contracts, resulting in a longer period with flexible employment contracts before the first open-ended contract is obtained.

The difference between ethnic groups is different from the picture that emerged from descriptive statistics. The pronounced difference between 2nd generation non-western immigrant and other groups appears to be mainly driven by their younger age. In the regression only a difference of less than 5%-point remains, while it was 25% in the raw data. The effect is opposite for 1st generation non-western immigrants: the raw difference of 5% increases characteristics to nearly 10% after controlling for other characteristics.

The difference between educational levels appears to be mainly driven by age difference as well. Corrected for other characteristics, medium and higher educated individuals still have a low probability to work on a flexible employment contract compared to lower educated individuals, but the difference is much smaller than the uncorrected difference. Over time the gap between low educated on the one hand and middle and high educated on the other, has widened: the coefficient is larger in 2015 than in 2003.⁹

Little remains of the differences between household positions after controlling for other characteristics. The 38%-point difference between children and singles reduces to 8%-points and the difference between singles and single parents reduces from 10%-points to 3%-

⁸ When the same analyses is performed for a sample without students, the results are almost the same, with one exception: the probability to work on a flexible contract among 18-24 year olds and 25-34 year olds is 10%-point lower in each year. The major part of the age-effect therefore seems to be driven by people entering the labor market, given the low probability to transition from a flexible to an open-ended contract and the even smaller probability to obtain an open-ended contract from non-participation.

⁹ The coefficients fluctuate over time and seem to follow the fluctuations in the unemployment rate.

points. The differences for partners in couples with and without children are roughly reduced to half the size in Table 1.

Women have a 3%-point higher probability to work on a flexible contract compared to men, in 2015 after correcting for the other characteristics, which is somewhat smaller than the raw difference. The difference between men and women is smaller in 2015 than in 2003. The pattern over time of the coefficient for being female (not shown in the table), is the mirror image of the unemployment rate. When unemployment is low, the difference between men and women in the probability to work on a flexible contract is largest. This pattern may be the result of different motives to work in flexible work arrangements for men and women. When flexible employment is a more positive choice for women, while men only work in a flexible employment if they have no other option, this picture may emerge. When economic circumstances improve, women will remain in flexible employment, while men move to open-ended contracts. But the same picture emerges when they are in a worse position to negotiate resulting in less open-ended contracts when the economy improves.

Table 2 Coefficients from multivariate linear probability model, standard errors in parentheses

year	flexible employment contract		own-account worker	
	2003	2015	2003	2015
<i>gender (reference is male)</i>				
female	0,041 (0,003)	0,033 0,004	-0,014 0,003	-0,026 0,004
<i>ethnicity (reference is native)</i>				
1st generation western immigrant	0,063 (0,011)	0,049 0,012	0,001 0,010	0,020 0,012
2nd generation western immigrant	0,013 (0,007)	0,035 0,009	-0,006 0,007	0,010 0,008
1st generation non-western immigrant	0,097 (0,011)	0,082 0,010	-0,030 0,006	-0,018 0,008
2nd generation non-western immigrant	0,088 (0,025)	0,074 0,014	0,001 0,011	-0,031 0,008
<i>educational level (reference is low)</i>				
middle	-0,036 (0,004)	-0,044 0,005	0,008 0,003	0,006 0,005
high	-0,027 (0,005)	-0,060 0,006	0,025 0,004	0,027 0,005
<i>age group (reference is 25-34yrs)</i>				
15-24	0,221 (0,010)	0,318 0,012	-0,028 0,005	-0,024 0,007
35-44	-0,029 (0,005)	-0,107 0,007	0,026 0,004	0,032 0,006
45-54	-0,043 (0,004)	-0,139 0,006	0,036 0,004	0,061 0,006
55-64	-0,031 (0,006)	-0,158 0,006	0,097 0,007	0,070 0,006
65-74	0,164 (0,024)	0,022 0,022	0,381 0,027	0,397 0,024
<i>position in household (reference is single)</i>				
single parent	-0,036 (0,013)	-0,016 0,011	-0,029 0,010	-0,028 0,010
part of couple with children	-0,052 (0,006)	-0,074 0,007	-0,016 0,006	-0,014 0,006
part of couple without children	-0,054 (0,007)	-0,050 0,007	-0,020 0,006	-0,010 0,007
child	0,037 (0,011)	0,058 0,013	-0,015 0,007	-0,012 0,008
other	0,026 (0,024)	0,073 0,020	-0,014 0,012	-0,013 0,014

Own account work

Regarding own account work, age is the most important determinant as well, but the mirror image of the probability to work. The higher the age, the higher the probability to work as an own account worker. This age effect is fairly stable over time. Only for 45-54 year olds there is a small upward trend, from 6%-points in 2003 to 8%-points in 2015.

The differences by educational level are smaller than the differences by age group. Medium educated workers have a 1%-point higher probability to work as an own-account worker compared to low educated workers. The size of this effect fluctuates somewhat over time, but there is no clear trend. This is opposite to the difference between high and low educated, which does show a small upward trend over time.

The difference between men and women in the probability to be an own-account worker has been ever increasing since 2003. In 2015 men had a 3%-point higher probability to be an own-account worker than women. Regarding ethnicity, only the difference between natives and 1st generation western-immigrants remains after controlling for the other characteristics (about 2%-point, the same size it had in the uncontrolled differences). All other differences by ethnicity disappear after controlling for background characteristics. Something similar happens with the effect of position in the household. After controlling for background characteristics only 1% of the 8%-point difference between singles and children remains.

4.3 A cohort perspective

Section 4.2 concluded that age is the most dominant factor for the probability to work as flexible employee or own account workers. This raises the question to what extent birth cohort differ in their probability to work in flexible work arrangements at various ages. We therefore present the share of workers in flexible contracts and own account workers for various birth cohorts.

Flexible employment contracts

In Figure 4 the line for each later cohort lies above the line of the previous cohort, which indicates that every later birth cohort has a larger share working on a flexible employment contract at all ages. Especially at young ages, the share increased rapidly between cohorts. It is not yet clear whether these large differences between cohorts will become smaller when these (young) workers age.

Another striking feature in Figure 4 is the sharp increase in flexible employment contracts for the oldest age groups (60-64 and 65-74) for birth cohorts born before 1950. For these cohorts the statutory retirement age was 65, but many were eligible for some form of early retirement. This results in a sharp decrease in the number of workers in these age groups. Those that keep on working, more often work on a flexible contract. In many sectors workers are automatically dismissed when turning 65 and to keep on working for their current employer a new employment contract has to be signed. This new contract is more often a temporary contract.

Figure 4 Share of all workers with flexible employment contract, by age and birth cohort

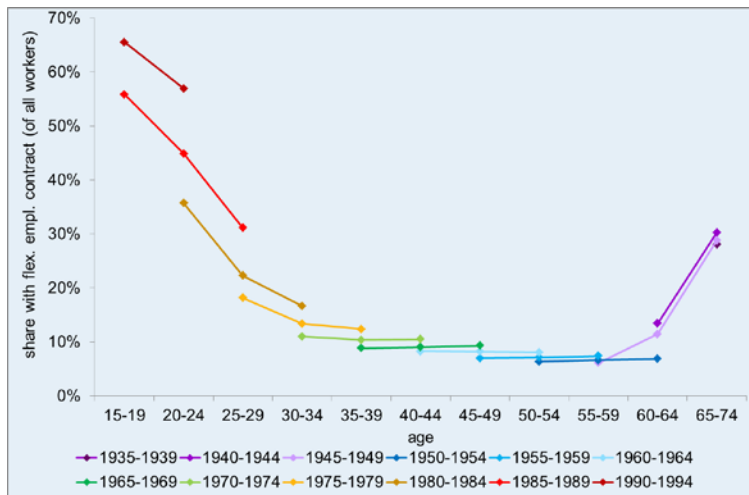
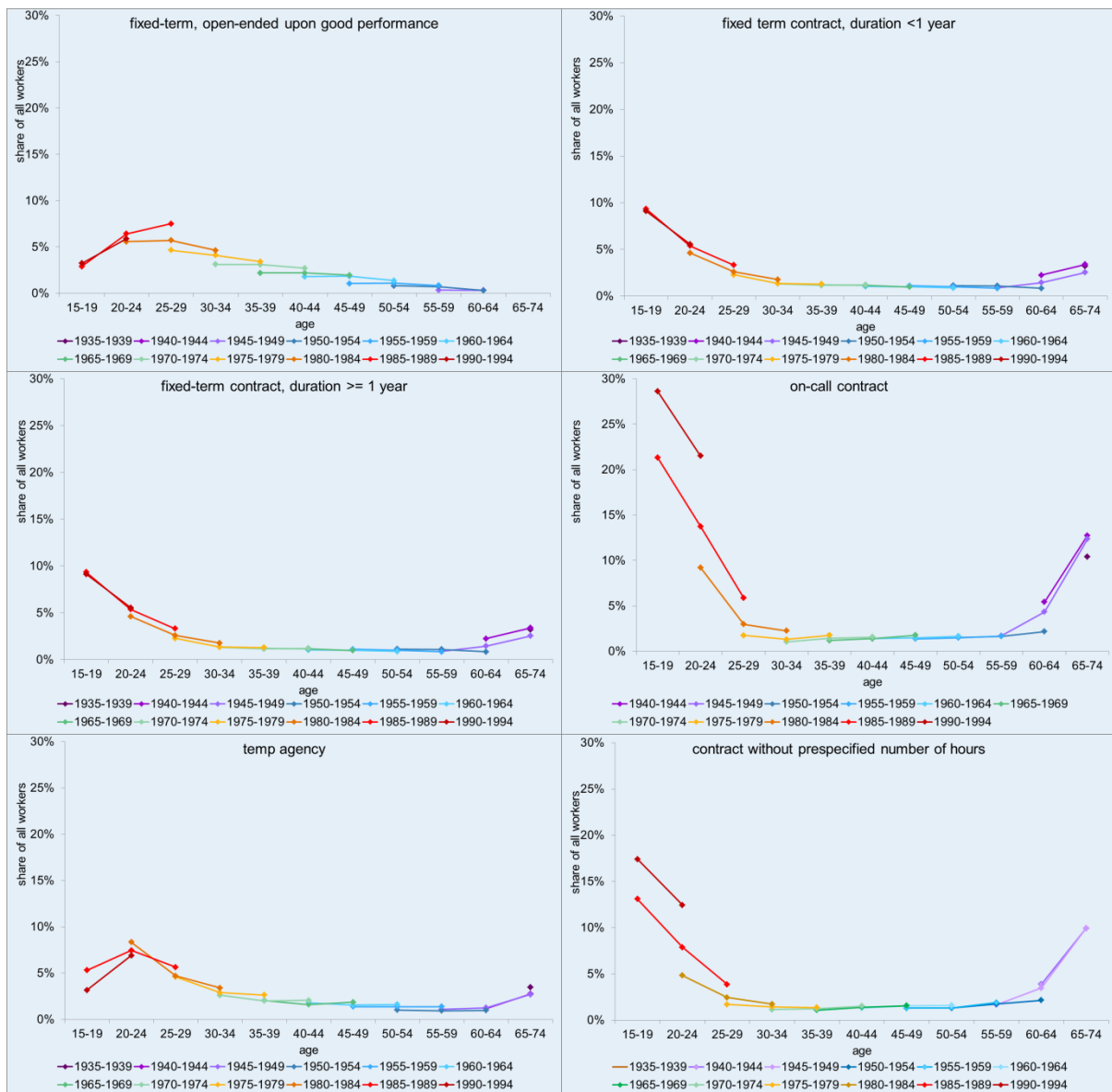


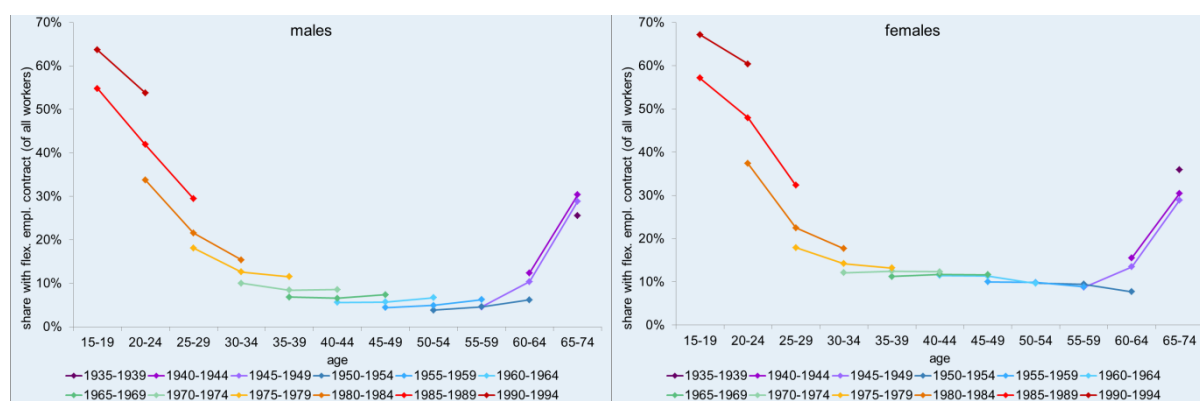
Figure 5 present the same cohort graphs for various types of flexible employment contracts. Some quite differential patterns lie beneath the pattern in Figure 4. Up to age 35, the increased probability to work on a flexible employment contract for each later cohort appears to be mainly driven by on-call contracts and contracts without a pre-specified number of hours, while beyond the age of 35 the pattern is driven by fixed-term contracts. For on-call contracts and contracts without a pre-specified number of hours every later cohort has a (much) larger probability to work on such a contract until the age of 35. Beyond 35 years of age younger cohorts are not much more likely to work in these types of contracts. For fixed-term contracts every younger cohort is somewhat more likely to work on such a contract. Differences are, however, much smaller than for on-call contracts, but do apply to every age group and not only to those under 35.

Figure 5 Share of all workers with particular type of flexible employment contract, by age and birth cohort. Separately for (a) fixed-term contract, open-ended upon good performance, (b) fixed-term contract, duration <1 year, (c) fixed-term contract, duration >= 1 year, (d) on-call contract, (e) temp agency work, (f) contract without prespecified number of hours



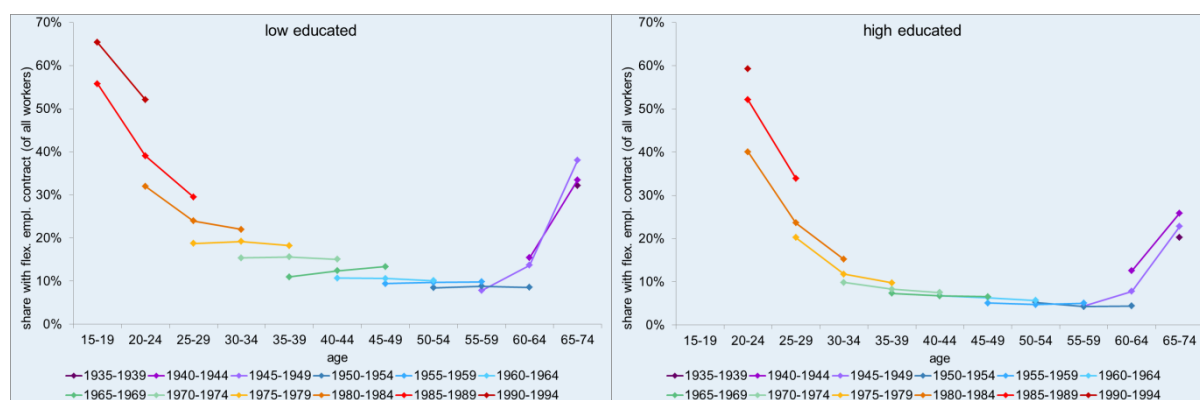
The pattern for men and women is quite similar, especially for the younger age groups and younger cohorts (Figure 6). After 30 the probability to work on a flexible employment contract declines faster for men than for women. However, for men the younger birth cohorts are more likely to work on a flexible employment contract, even after age 30. For women this does not hold: the probability is stable across birth cohorts.

Figure 6 Share of all workers with flexible employment contract , by age and birth cohort. Separately for males (left) and females (right).



Separate cohort analyses by educational level (Figure 7) reveal that higher educated have a higher probability to work on a flexible employment contract under 25 (for all birth cohorts). Above 25, however, the probability declines much faster for the high educated.

Figure 7 Share of all workers with flexible employment contract , by age and birth cohort. Separately for low educated (left) and high educated (right).



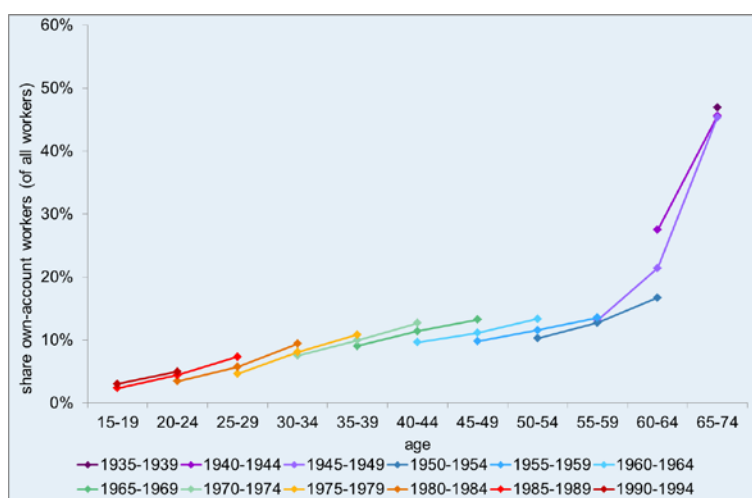
Own account work

Like flexible employment contracts, the share of own-account workers increases for every later cohort. Another similarity with flexible employment contract is the sharp increase beyond the age of 65 (for older cohorts with eligibility for early retirement schemes already beyond the age of 60).¹⁰ The difference is however that the share of own account work increases with age, as was already concluded in section 4.2.

Most of the cohort lines run in parallel up to the age of 60, which implies that the increase in the share of own-account workers below the age of 60 is the result of own-account workers starting as own-account worker at a younger age (which has been found before by de Beer (2013)). According to Van Es and Van Vuuren (2011) this is the result of the higher educational attainment among younger generations.

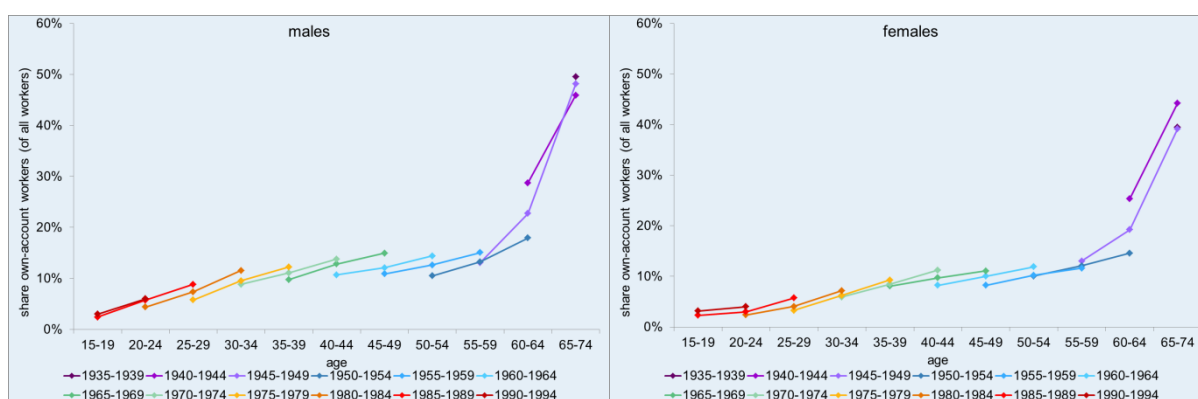
¹⁰ For own-account work this sharp increase is the result of two factors: first, own-account workers retire later compared to employees, and second, a part of all employees chooses to keep on working (usually for a smaller number of hours than before) as own-account worker.

Figure 8 Share of all workers working as own-account worker, by age and birth cohort.



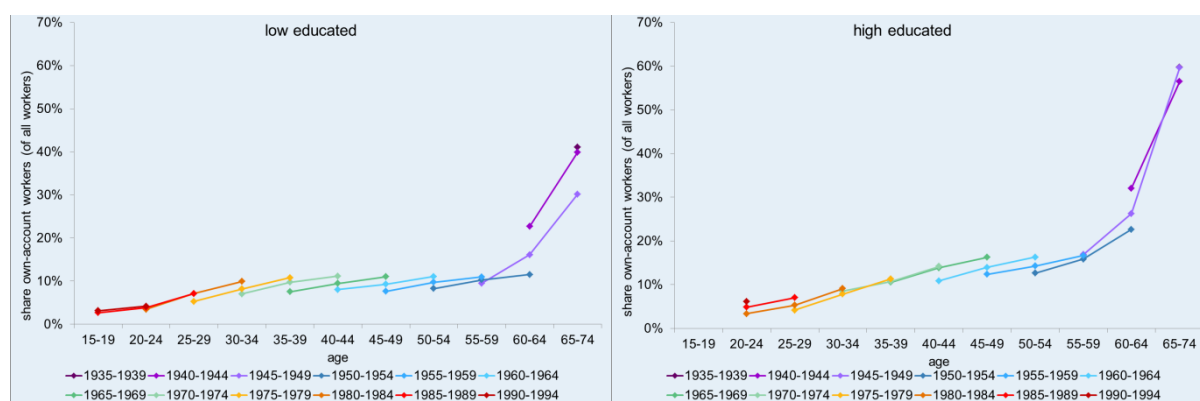
Separate analyses for men and women (Figure 9) show that the share of own-account workers is higher among men, and that for every cohort the increase in the share of own-account workers at any age is larger for men than for women.

Figure 9 Share of all workers working as own-account worker, by age and birth cohort. Separately for males (left) and females (right).



Separate analysis by educational attainment (Figure 10) show that for low educated the share of own account workers increases with every younger cohort for all ages, while for high educated this is only the case above the age of 40. However, the increase with every younger cohort is higher for high educated than low educated.

Figure 10 Share of all workers working as own-account worker, by age and birth cohort. Separately for low educated (left) and high educated (right).

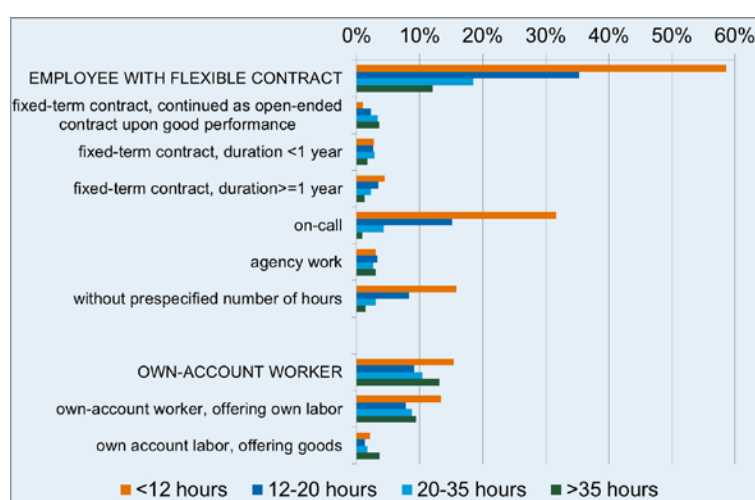


5. Characteristics of flexible jobs

This paragraph is purely descriptive at the moment. We aim to use a regression model here as well to correct for multiple variable (size, sector, etc.) at the same time.

Figure 11 shows the share of flexible contracts for jobs of different sizes. Flexible employment is most common for small job with less than 12 hours per week. Almost 60% of all jobs with less than 12 hours is a job on a flexible employment contract. More than half of these jobs have an on-call contract. Another 16% are jobs without a prespecified number of hours per week. These types of contracts are the most flexible (and therewith least secure) types among the flexible contracts. This is a sharp contrast with fulltime (>35 hours) jobs. Of all fulltime jobs only 12% is on a flexible employment contract, of which 4%-points with a contract that will be continued as open-ended upon good performance and 2%-points fixed-term contract with a duration of more than a year. This implies that half of the people on a fulltime flexible employment contract has one of the two most secure types of flexible contracts.

Figure 11 Share of working with particular type of flexible employment, by size of job, 2015

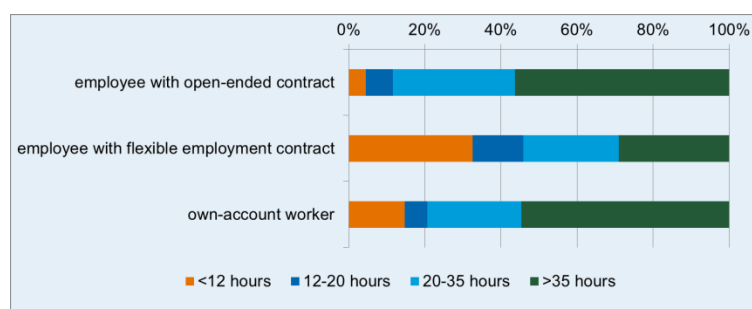


More than half of all open-ended contracts are contracts for 35 or more hours per week (Figure 12). Also more than half of all own-account workers work 35 or more hours per week. Of all workers with a flexible employment contract less than 30% has a fulltime job.

Over time the size of jobs with a flexible employment contract or performed by own-account workers hasn't changed much. For all job sizes the share of workers with a flexible employment contract or working as own-account worker has increased between 2003 and 2015 (not shown). Small jobs for 12 hours per week or less are relatively often filled by people aged 15-25: more than 57% of these small jobs is filled by someone from this age group. In addition, employees with a small job are more often low or middle educated.

Own-account workers by definition have no contract size in hours per week, but from surveys it is still possible to obtain a rough idea of the number of hours own-account workers work. The share own-account workers is highest among people working less than 12 hours per week (15%). Differences here are however much smaller compared to flexible employment contracts. Of those working fulltime, 13% works as own-account worker. Someone is classified as own-account worker if he indicates to be an own-account worker in the job he spends most time on. Those classified as own-account workers working less than 12 hours per week can therefore not be employees with a small job as own-account worker on the side.

Figure 12 Size of jobs on open-ended contract, flexible employment contract and as own-account worker, 2015



Differences by sector

The share of workers with a flexible employment varies substantially between sectors (Figure 13). Flexible employment is most common in Agriculture, Arts, entertainment and recreation and Accommodation and food service activities with respectively 58%, 58% and 56% flexible employment. On the other side of the spectrum is Public administration and defence with only 11% flexible employment. Whether flexible employment contracts or own-account work is used also varies widely between sectors. Many sectors have either predominantly employees on flexible contracts or own-account workers. The sectors Agriculture, Arts and Accommodation and food are comparable in the amount of flexible employment they use, however, Agriculture and Arts use predominantly own-account workers, where Accommodation and food predominantly uses employees on flexible contracts. Other sectors with a large share of own-account work are Other service activities, Professional, scientific and technical activities and Construction and Information and communication. In these sectors 20 to 30% of all workers is own-account worker. Sectors with a high share of employees on flexible contracts are (besides Accommodation and food) Administrative and support services activities, Wholesale and retail trade and Transportation and storage.

Sectors also differ in the type of flexible contracts that is used for employees.

Accommodation and food uses relatively often on-call contracts and contracts without a prespecified number of hours, while Professional, scientific and technical activities uses

mostly fixed-term contracts and Manufacturing uses relatively often temp agency workers (Figure 14).

In Agriculture and Wholesale and retail trade own-account workers mostly offer goods, in other sectors they mostly offer own labor.

Figure 13 Type of job as share of all workers, by sector, 2015

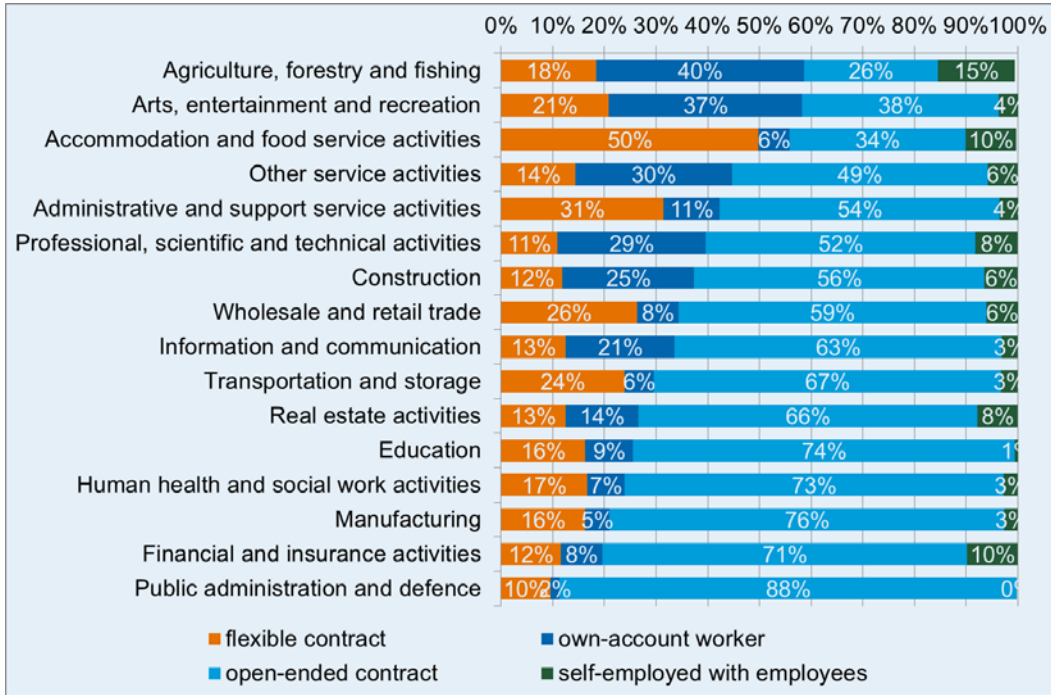
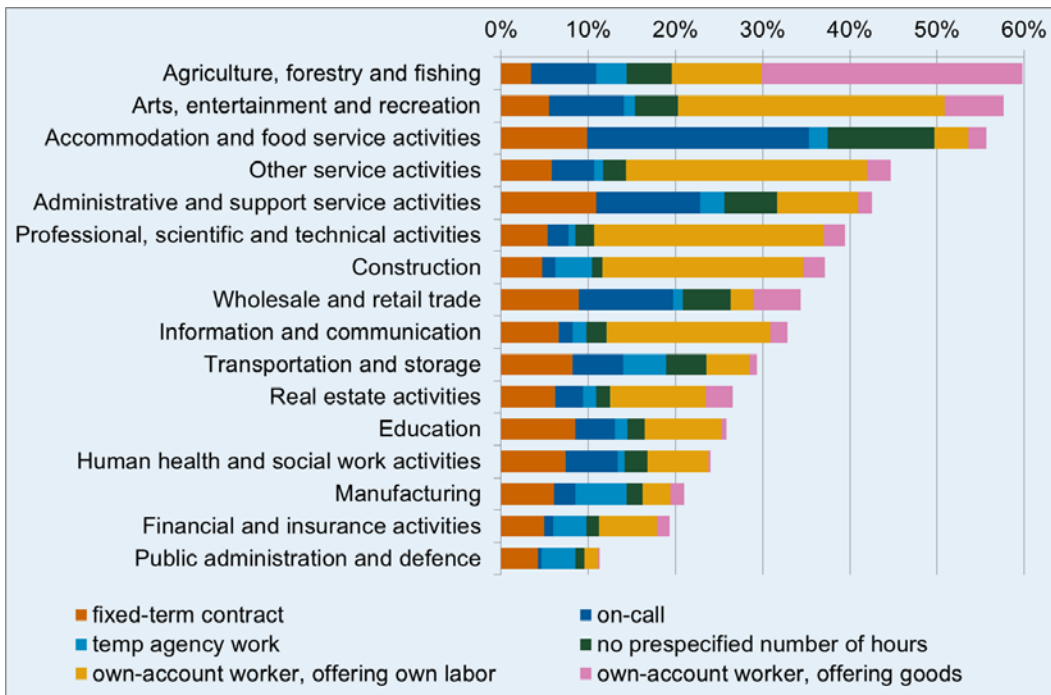


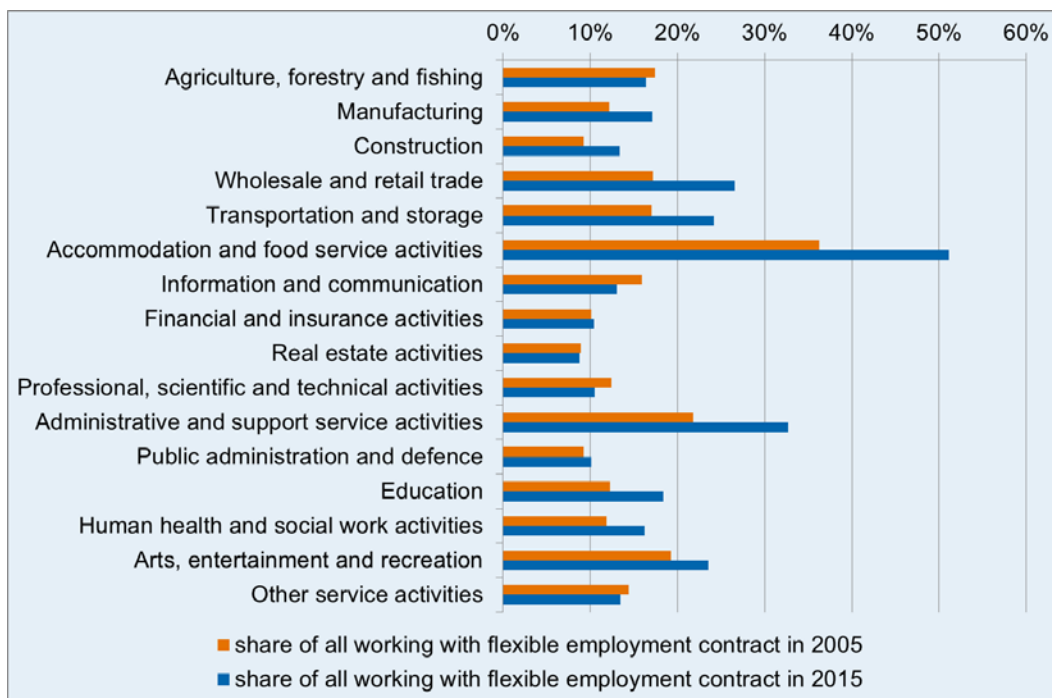
Figure 14 Share of working with particular type of flexible employment, by sector (NACE), 2015



When the share of flexible employment contracts by sector in 2015 is compared with the share in 2005, it turns out that in each sector the share of workers on a flexible employment contract and the share of own-account workers has **increased (Figure 8 and ????)**. The share with a flexible employment contract has risen especially in sectors Wholesale and retail trade, Transportation and storage, Accommodation and food and Other service activities. The latter two sectors already had the largest share of flexible employment contracts in 2005; hence this increase does not seem to be the result of catching-up.

The increase between 2005 and 2015 in the share of own-account workers is especially pronounced in the sectors Construction and Information and communication. But also Professional, scientific and technical activities and Other service activities show a sharp increase in own-account work. Sectors that traditionally have the largest share of own-account workers, Agriculture and Arts, show a much more modest growth in the period 2003-2014.

Figure 15 Share of workers with flexible employment contract (as share of all workers), per sector, in 2005 and 2015.



6. A sectoral and occupational perspective on the growth of flexible employment

In this section we investigate the association between the incidence of flexible employment and number of explanatory variables by taking a sectoral perspective. As shown in section 5, the share of flexible work arrangements differs substantially between sectors of industry. In this section we investigate whether the difference in the share of, and growth of, flexible employment is associated to sectoral characteristics. We consider technological advancement, globalisation, business cycle fluctuations and bargaining power of workers as potential explanatory variables for (changes in) the use of flexible employment. These

factors are arguably not the full set of possible explanations for the increase of flexible work arrangement. Other factors may play a role as well, such as institutional factors, privatisation, outsourcing or decentralisation of government policy. As such, the results of our analysis cannot be interpreted as a causal effect, but more as associations that provide a good starting point for further research into the determinants of the prevalence of flexible employment.

6.1 Fixed-effect regressions on the sectoral level

We perform longitudinal analyses on 16 sectors in the Dutch economy¹¹. The following Fixed-Effects (FE) regression is estimated to determine the associations with the explanatory variables:

$$(1) Y_{i,t} = \alpha_i + \beta K_{i,t} + \gamma T_{i,t} + \varepsilon_{i,t}$$

where $Y_{i,t}$ is the first difference of the share of flexible contracts of as a percentage of the total number of workers in sector i in year t , the vector $K_{i,t}$ represents a set of sector characteristics, such as the demographic composition¹², and the vector $T_{i,t}$ is a set of time dummies that accounts for structural changes in the growth of the share of flexible employment that cannot be explained by our set of explanatory variables. We estimate this equation separately for the share of flexible contract and the share of own-account work as a percentage of all workers.

We use data on the share of flexible employment contracts and own-account workers from Statistics Netherlands, which is available for the period 2003-2015 (see Table 3). Globalisation is measured as the share of export of total sales within a sector. Business cycle fluctuations are measured as the growth in sectoral economic output. We measure the bargaining power of workers by the vacancy-to-unemployment ratio. Technological advances in the workplace are measured as the share of ICT capital of total capital within a sector. This information is only available up to 2010, so in order to use this variable in the FE-regression the sample period must be limited to the period 2003 – 2010. These explanatory variables are added to the vector $K_{i,t}$ in equation (1).

¹¹ These sectors are based on the NACE sector classification: 1. Agriculture, forestry and fishing, 2. Manufacturing, 3. Construction, 4. Wholesale and retail trade; repair of motor vehicles and motorcycles, 5. Transporting and storage, 6. Accommodation and food service activities, 7. Information and communication, 8. Insurance, reinsurance and pension funding, except compulsory social security, 9. Real estate activities, 10. Professional, scientific and technical activities, 11. Administrative and support service activities, 12. Public administration and defence; compulsory social security, 13. Education, 14. Human health and social work activities, 15. Arts, entertainment and recreation, 16. Other services activities. Three sectors are omitted due to limited sample size: Mining and quarrying, Electricity, gas, steam and air conditioning supply and Water supply; sewerage; waste management and remediation activities.

¹² These control variables are: the share of workers with a certain education level (middle & high), share of men, share of age-groups (young (15-30) and middle-aged (30-50)) and share of workers with an immigration background.

Table 3 Data availability

Variable	Indicator	Data availability
Share of flexible employment contracts	-	2003 - 2015
Share of own account workers	-	2003 - 2015
Technological advances	Share of ICT capital of total capital	2003 - 2010
Globalisation	Share of export of total sales	2003 - 2015
Business cycle	Output growth	2003 - 2015
Bargaining power of workers	Vacancy-to-unemployment-ratio	2003 - 2015

Results are presented in Table 4 and indicate that the increase in the share of flexible employment contracts is positively associated with increases in the openness of sectors (globalisation) and negatively associated with the use of ICT-capital. More specifically: a 1%-point larger increase in the share of export is associated with roughly a 0,4% larger increase in the share of flexible employment contracts. A 1%-point larger increase in the share of ICT-capital is associated with a 1,16%-point larger increase in the share of flexible employment. No statistically significant association is found between the share of flexible work arrangements and the bargaining power of workers, approximated by the vacancy-to-unemployment ratio. The estimation on the use of own-account workers finds no statistically significant associations with neither globalisation, nor technological change or bargaining power of the workers.

Table 4 – Results of the FE-regressions

<i>independent variable</i>	Dependent variable			
	Δ share flexible employment contracts		Δ share own-account workers	
	'03-'15	'03-'10	'03-'15	'03-'10
Technological advances (Δ share ICT capital)		-1,161** (0,545)		0,689 (0,799)
Globalisation (Δ share export of total sales)	0,423*** (0,151)	0,438*** (0,193)	-0,032 (0,136)	-0,21 (0,233)
Business cycle (% growth output)	0,062 (0,041)	0,061 (0,041)	0,003 (0,039)	-0,014 (0,039)
Bargaining power of workers (level of VU-ratio ¹)	-0,518 (0,713)	-0,782 (0,707)	-0,548 (0,685)	-0,631 (0,824)
Descriptive statistics				
N	176	96	176	96
R ²	0,434	0,612	0,216	0,323

¹Measured at the start of the year

* p < 0.10, ** p < 0.05, *** p < 0.01

Standard errors in parantheses

Estimated using Newey West HAC (1 year lagged residuals) with sector and year fixed effects

Additional control variables: Δ share higher and middle educated workers, Δ share male workers, Δ share young (15-30) and middle-aged (30-50) workers, Δ share workers with an immigration background, 1-year lagged dependent variable and a constant

We aim to extend our sectoral analysis by building a dataset with quarterly (instead of yearly) data and estimate for each sector separately the association over time between

changes in the share of different types of employment and a number of economic variables (e.g. business cycle), and subsequently use these estimates to construct the mean group estimator (Pesaran and Smith, 1995) for the average effect.

6.2 Linear probability model on the occupational level

In order to deepen our understanding of the relation between workers bargaining power and the share of flexible employment relations, we investigate the association of labour market tightness with the shares of different types of employment arrangements at the occupational level. Section 6.1 found no relation between labour market tightness and the increase of flexible employment contracts or own account work. In this section, we analyse cross-sectionally whether occupations that experience labour shortages have a different share of open-ended and flexible employment relations (as a percentage of total workers). Hence, this analysis answers a different question than the analysis in the previous, which looks at the changes within sectors over time. Since no data on technology use and globalisation are available on the occupation level, we restrict ourselves to the analysis of the relation to labour market tightness. The Dutch Public Employment Office (UWV) reports a quarterly measure of labour market tension. We use this information as a proxy for worker bargaining power. This labour market tension indicator measures the ratio between the number of new job openings and the number of job seekers registered at the UWV.¹³ Data on the share of different types of employment relations is collected from Statistics Netherlands.

We use a sample of 114 occupations¹⁴ with quarterly labour market data from the first quarter of 2011 to the third quarter of 2016. However, since the Statistics Netherlands can only accurately report the number of workers in thousands, the shares of the different employment relations become unreliable when the total number of workers is small. In our analysis we do not use data on occupations with less than 50 thousand total workers ($N = 50$). The occupations that do not meet this criterion are combined, such that they contain at least 50 thousand workers. An overview of the occupations and the combinations made can be found in the appendix. After combining the smaller occupations, our sample contains 73 occupations.

In order to quantify the association between the LMT indicator and the share of a certain employment type we estimate the following regression:

$$(1) A_t^C = \alpha_t^C + \beta_t^C \log(LMT_{i,t}) + \gamma_t^C C_{i,t} + \varepsilon_{i,t}^C$$

This regression is a cross-sectional regression, estimated separately for each quarter in our sample period. A_t^C is the share of employment relation type C in quarter t . $LMT_{i,t}$ is the labour market tension and $C_{i,t}$ is a vector of demographic control variables¹⁵ of occupation i in quarter t . The association between the labour market tension and the share of employment relation C as a percentage of total workers in quarter t is represented by β_t^C .

¹³ To construct this indicator, UWV uses data on job openings collected by Statistics Netherlands, in combination with information on the number of new job openings collected from the internet using a web crawler, developed by the firm 'TextKernel'.

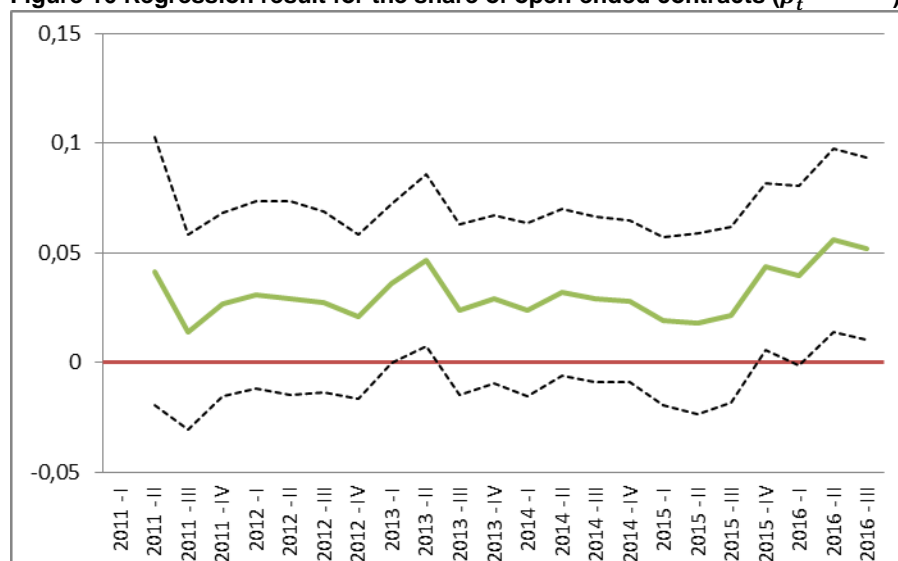
¹⁴ based on the International Standard Classification of Occupations, ISCO

¹⁵ The vector of control variables consists of: quarterly growth of total number of workers, share of low and higher educated workers, share of 15-35 and 55-75 year olds, share of men in part-time jobs, share of women in full-time jobs and share of women in part-time jobs (all shares as a percentage of total workers within an occupation).

In our analysis we consider the following employment relations: open-ended employment contracts, flexible employment contracts and own-account workers. We make a further distinction in the flexible employment contracts by analysing on-call work separately. After excluding on-call work, flexible employment contracts consist of: fixed-term contracts, contracts without prespecified number of hours and agency work.

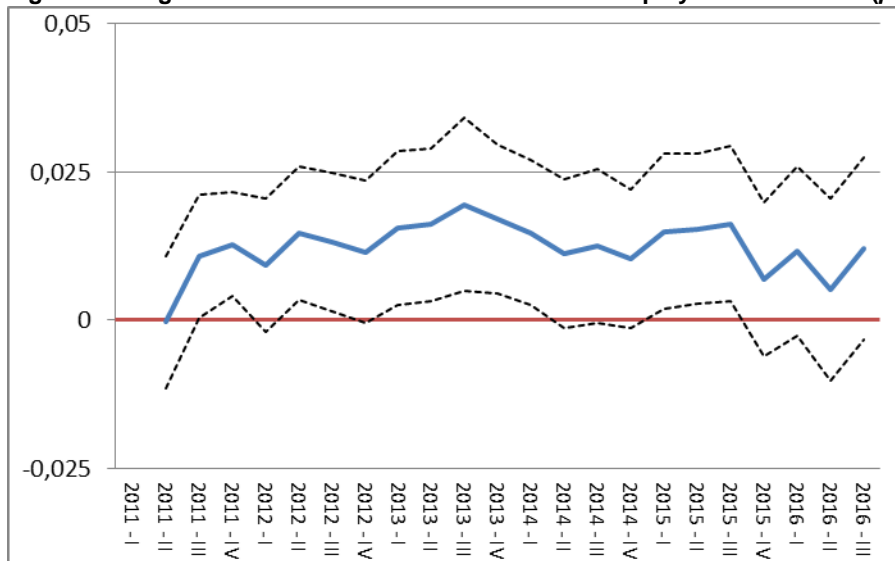
The regression results for the share of open-ended contracts (Figure 16) indicate that the share of open-ended contracts is generally higher in occupations with a high labour market tightness. This is what you would expect if workers in occupation with tighter labour market have more bargaining power to negotiate an open-ended contract. However, this difference is statistically significant ($p < 0.1$) in only 4 quarters (out of 23).

Figure 16 Regression result for the share of open-ended contracts ($\beta_t^{permanent}$)



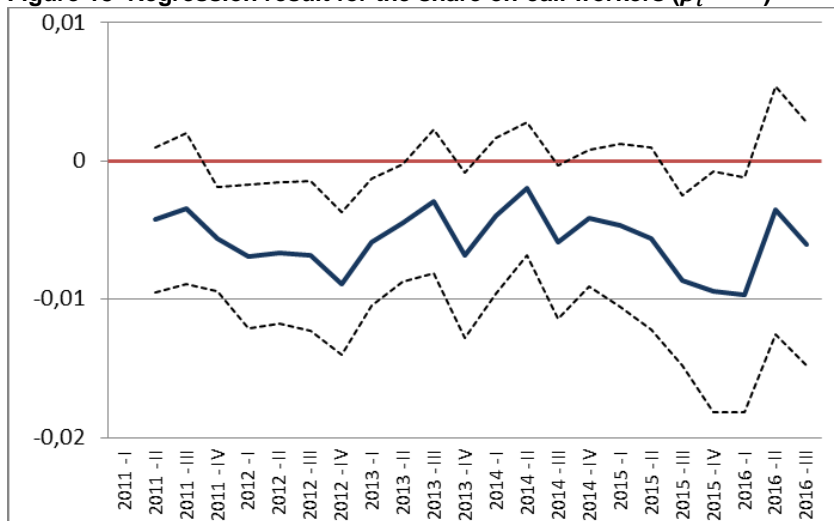
Remarkably, the share of flexible employment contracts (Figure 17) is also higher in occupations with high labour market tightness. This is what one would not expect to be the case, if workers in tight labour market have the bargaining power to negotiate their preferred work arrangement (which for most workers is not a flexible one). This difference is statistically significant in roughly half of the quarters (12 out of 23). Since the last quarter of 2015 the difference has no longer been significant.

Figure 17 Regression result for the share of flexible employment contracts ($\beta_t^{flexible\ employment\ contract}$)



The share of on-call work is lower for occupations with a high labour market tightness indicator (Figure 18), which is what you would expect if on call work is not the preferred work arrangement for most workers. This effect is especially significant in occupations with a large share of low educated workers (Figure 19). These results imply that the negative association between labour market tightness and the share of on-call workers is stronger for occupations with a large share of low educated workers¹⁶.

Figure 18 Regression result for the share on-call workers ($\beta_t^{on-call}$)

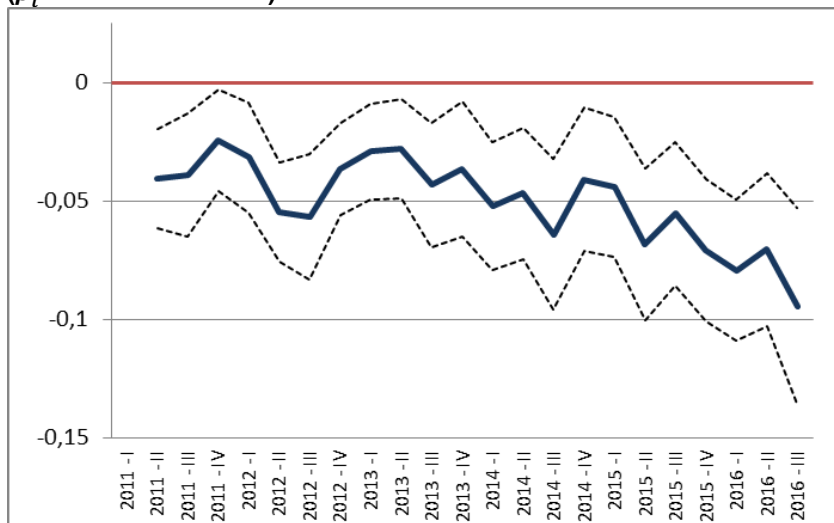


¹⁶ This has been estimated using the following equation:

$$A_t^C = \alpha_t^C + \beta_t^C \log(LMT_{i,t}) + \beta_t^{C,lower\ educated} \log(LMT_{i,t}) * E^{low} + \varepsilon_{i,t}^C + \gamma_t^C C_{i,t}$$

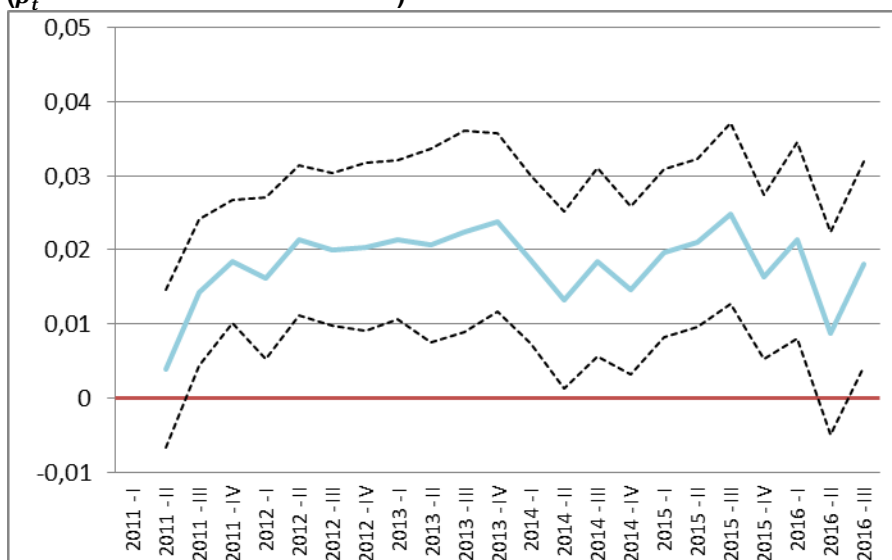
Where E^{low} represents the share of low educated workers (as a percentage of total workers). $\beta_t^{C,lower\ educated}$ is the effect of LMT on A_t^C for an occupation with only low educated workers, in addition to the general effect (β_t^C). The same equation has also been estimated for the other employment relations, but this did not produce significant results.

Figure 19 Regression result for the share on-call workers interacted with share of low educated workers
 $(\beta_t^{on-call, share\ low\ educated})$



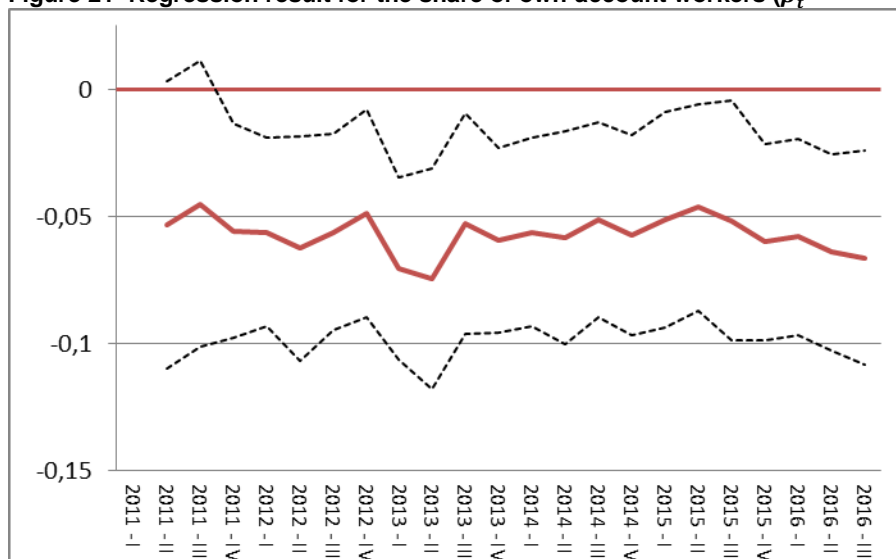
The opposite holds for the rest of the flexible employment contracts excluding on-call workers. Strangely, this share is significantly higher in occupations that are characterised by labour shortages (Figure 20).

Figure 20 Regression result for the share of flexible employment contracts excluding on-call
 $(\beta_t^{flexible\ employment\ contract\ excl.on-call})$



The share of own-account workers is significantly lower in occupations that are characterised by labour shortages. This holds most for occupations with a large share of low and middle educated workers (Figure 21).

Figure 21 Regression result for the share of own-account workers ($\beta_{\xi}^{own-account}$)



8. Conclusions

In this paper we have investigated the incidence of various forms of flexible work arrangements in the Netherlands since the early 2000's and analysed both the individual perspective and the types of jobs that are mostly involved. Our results have shown that age is the key determining factor for the probability to work in a flexible work arrangement. Other relations are to a large extent driven by the association with age. Low educated workers, migrants, women and people with their parents often work in flexible employment contracts. After controlling for the correlation among background characteristics only a small part of this difference remains. The difference in probability to work on a flexible contract between high and low educated, for example, drops from 17%-points to 6%-points and the difference between migrants and natives drops from a 25%-point to 7% points once we correct for background characteristics.

The association with age differs between flexible employment contracts and own account work: the probability to work as own account worker increases with age, whereas the probability to work on a flexible employment contract decreases with age. A similarity is however that the share of both flexible employment contracts and own-account work has increased for every later birth cohort. Another similarity with flexible employment contract is the sharp increase beyond the age of 65 (for older cohorts with eligibility for early retirement schemes already beyond the age of 60).

The increased probability to work on a flexible employment contracts for every later birth cohort is –up to age 35– mainly driven by on-call contracts and contracts without a pre-specified number of hours. Beyond the age of 35 the increase is driven by fixed-term contracts.

Separate cohort analyses on the probability to work on flexible employment contracts by educational level has revealed that higher educated workers have a higher probability to work on a flexible employment contract under the age of 25 (for all birth cohorts). Above 25, however, the probability declines much faster for the high educated. We can therefore concluded that the higher probability to work on a flexible work arrangement for lower

educated workers is not so much driven by a higher probability to start on a flexible contract, but rather by a slower flow from flexible to open-ended contracts as they are longer on the labour market.

Separate cohort analyses on the probability to work as own account workers for men and women has revealed that for every cohort the increase in the share of own-account workers at any age is larger for men than for women.

To be done: add conclusions on characteristics of flexible jobs, plus the sectoral and occupational analysis

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Appendix 1

Table A1 Percentage of all workers in particular subgroup with flexible employment contract and working as own account worker, 2015

	fixed-term, open-ended upon good performance	fixed-term, duration <1 year	fixed-term, duration>=1 year	on-call	agency work	without prespecified number of hours	own- account worker, own labor	own account labor, goods
male	3,2%	1,8%	1,9%	5,2%	3,6%	3,8%	10,5%	3,5%
female	3,3%	2,8%	2,5%	7,6%	2,6%	4,7%	8,5%	1,8%
15-24yrs	5,0%	4,9%	6,7%	27,7%	5,1%	16,0%	5,0%	0,2%
25-34yrs	6,4%	4,0%	2,5%	4,2%	5,0%	3,1%	7,3%	1,7%
35-44yrs	3,0%	1,5%	1,2%	2,0%	2,7%	1,8%	9,6%	2,3%
45-54yrs	1,7%	1,1%	0,9%	1,5%	2,1%	1,5%	10,9%	3,6%
55-64yrs	0,8%	0,6%	0,8%	2,0%	1,6%	2,1%	11,7%	4,2%
65-74yrs	0,0%	0,0%	2,1%	11,6%	2,0%	8,7%	36,2%	12,6%
low	2,5%	2,2%	3,3%	12,1%	4,1%	7,5%	7,6%	3,5%
middle	3,3%	1,9%	2,1%	6,6%	3,6%	4,1%	8,5%	2,9%
high	3,7%	2,7%	1,6%	2,7%	2,0%	2,4%	12,1%	2,0%
single	3,8%	2,7%	2,6%	5,7%	4,7%	4,8%	11,1%	2,4%
single parent with partner and children	3,2%	2,6%	2,1%	3,0%	2,8%	2,8%	9,1%	1,5%
with partner, no children	2,4%	1,3%	1,0%	2,0%	2,1%	1,6%	9,5%	3,1%
with parents	3,5%	2,3%	1,3%	3,3%	2,7%	2,8%	11,5%	3,4%
other	4,3%	4,7%	6,7%	26,6%	5,2%	14,8%	5,0%	0,5%
other	6,7%	2,5%	3,8%	13,9%	6,6%	8,3%	8,0%	2,4%
native western immigrant, 1st generation	3,1%	2,2%	2,0%	6,1%	2,7%	4,0%	9,7%	2,9%
western immigrant, 2nd generation	3,6%	2,1%	2,3%	4,4%	3,9%	4,5%	11,5%	2,8%
non-western immigrant, 1st generation	3,8%	2,9%	2,1%	5,6%	3,6%	4,4%	11,2%	2,4%
non-western immigrant, 2nd generation	3,4%	1,6%	3,0%	6,8%	5,7%	4,7%	8,6%	1,8%
other	5,6%	4,0%	4,7%	13,7%	7,2%	9,3%	4,4%	1,0%

Figure A1 Share of workers on flexible employment contract (left) or working as own-account worker (right), by age group for 2003-2015

