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Labour market flexibilization and wage growth: did workers reap the benefits?

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Abstract

There is a hot debate in the Netherlands on the effect of labour market flexibilization on workers. This paper investigates the link between flexibilization and the wage growth. The economic insider-outsider theory predicts that flexible workers are paid less and that flexibilization will lead to lower wages. In this paper, I use Bartik instruments in a fixed-effects regression design to investigate Dutch data on 19 economic sectors in the last two decades. I exploit the initial variation in the incidence of flexible labour as a measure of exposure to two legal changes that promoted flexibilization. It turns out that the earlier law favouring temporary contracts increased wage growth, whereas the later law favouring self-employment decreased it. This is probably due to the increasing use of flexible labour to avoid the payment of social contributions, and a change over time in the way flexible labour is deployed. The findings show that flexible labour is used by employers to economize on wage costs, and can therefore erode wage growth.

Introduction & theoretical framework

The average and median wage have only been growing slowly in Western Europe since the Eurocrisis. As wage growth is an important driver for aggregate demand, this fact has drawn a lot of attention in the current economic policy debate. For instance, the OECD (2018), the ILO (2018) and the IMF (2017) have published reports on the reasons behind this slowdown of the wage growth. In these reports, they suggest various reasons that could cause the slowdown. It might be caused by unmeasured slack in the labour market, involuntary part-time employment, low inflation expectations and the stabilization of labour productivity. Moreover, they suggest that the bargaining power of workers might have decreased, which could have led to lower wages on average.

In the Netherlands, Paans & Euwals (2018) try to explain the deceleration of the Dutch wage growth. They investigate the impact of several factors, such as globalisation, capital deepening and increasing flexibility (also called *flexibilization*) in the labour market. However, their analysis of flexibilization cannot be interpreted causally, since there are several possible sources of endogeneity in their research. This paper attempts to overcome the deficits in their research design and estimate the causal relationship between flexibilization and wage growth. This is done by the use of exogenous variation in the proportion of flexible workers. This variation is due to the introduction of laws that liberalized the use of flexible labour and self-employment. In order to measure the effect of an increase in flexible labour more precisely, the proportion of flexible labour is used as a Bartik instrument in the fixed-effects estimation. This research design goes a long way in overcoming the endogeneity concerns in the study of Paans & Euwals.

Literature

There is a rich economic literature on the impact of the bargaining power of workers on wages. The seminal work of Layard & Nickell (1986) describes how firms increase their prices and workers their wages in an inflationary cycle, where relative bargaining power determines how added value is shared. As both workers and firms formulate their demands as a mark-up on the current prices and wages, they call this process “the battle of the mark-ups”.

Wage growth can be better understood by decomposing it into three components: compensation for inflation, allocation of changes in labour productivity and the resulting change in the wage share (Van Tilburg & Suyker, 2018). This decomposition is based on the fact that inflation expectations generate demands for wage increases. Therefore, a mismatch between expected and realized inflation can alter

the distribution of added value. On top of that, it is also important to account for the changes in labour productivity, which should in principle be allocated to the workers. The change in wage share finally sheds light on the changes in relative bargaining power.

Many researchers have tried to clarify the causes of the recent decline of the wage share, an international phenomenon, which is related to the slowdown of wage growth. Acemoglu and Restrepo (2018) argue that the dynamics of technological progress might generate inequality, as high-skilled labour is adapting faster to the new situation. Moreover, the global decline in the costs of capital might lead to capital deepening and an increase in the capital share (Karabarbounis & Neiman, 2014). However, Stansbury and Summers (2017) do not find evidence in the US for the claim that technological progress depresses the wage share. Neither do Elsby et al. (2013), but they argue that it is globalization that has an impact on wages. Another, even more convincing strand of research argues that the main driver of the decline in the labour share is the increase in market power of firms (Autor et al, 2017; De Loecker & Eeckhout, 2017). Mark-ups have increased, but firms have not shared these gains equally with their workers, and the labour share has declined as a result.

With respect to productivity, Stansbury and Summers (2017) argue that the productivity gains in the US in the past decades have no longer been allocated to the workers, especially not at the level of the ordinary industrial worker. Pasimeni (2018) replicates this research with European data and finds comparable, but smaller estimates. Moreover, productivity itself has been growing slower as well. According to Dew and Gordon (2005), this might lead to inflation, since unions will project their expectations of past productivity increases and demand wages accordingly, whereas producers will have to set higher prices to compensate for the fact that productivity is no longer rising.

However, not everyone is searching for the reason for this slowdown in wage growth in developments outside the labour market. Many turned inside it and examined the development of the labour market itself to find the causes of the slowdown. For instance, Smith (2014) and Blanchflower & Posen (2014) argue that the main cause for the slowdown is labour market slack: outside of the statistics, there still are many who are not officially unemployed but do want a job, and as a result are depressing wage growth. The IMF (2017) and OECD (2018) complement this analysis by adding the slack of many part-time workers who would like to work longer hours, but are unable to do so.

Bemmelech, Bergman & Kim (2018) did research into the distribution of market power on the labour market. They found that the market power of employers increased in the US in the last four decades. This increase in market power in negatively related to wage levels. This is especially the case in circumstances of local monopsony, when in a certain sector and region, in there is only a single employer available. Therefore, they suggest the increase in monopsony power as the reason for the stagnation of wage growth.

Others argue that a core problem of the European labour markets is its dual-tier labour contract system, consisting of heavily protected insiders with permanent contracts and outsiders on flexible contracts who do not enjoy this protection. On the whole, they claim, these outsiders, for instance on temporary contracts, get lower wages (Blanchard & Landier, 2002). The insiders are protected against dismissal by their permanent contracts and Employment Protection (Lindbeck & Snower, 2001). As a result, they have some market power and are able to extract rents from their employers. The outsiders on flexible contracts do not have this protection and accompanying market power, and are expected to obtain lower wages.

Brown and Sessions (2005) provide statistical evidence with British data for the fact that flexible workers are paid less. Boeri (2011) estimates this wage premium on permanent contracts for several European countries, and the figure for the Netherlands is 35,4%. All of these wage premiums are statistically significant, which shows that flexible workers are paid less. Centeno and Novo (2014) provide evidence that negative EPL (Employment Protection Legislation) shocks for employers are shifted to the outsiders, causing an increase in the wage premium. The Dutch statistical office also found (CBS, 2016) that flexible workers are paid less than permanent workers. This research thus indicates that temporary jobs are paid worse, and that an increase in them might lead to lower wages on average.

Research has also been done into the causes of this wage premium for permanent contracts outside the insider-outsider theory. It has been found that flexible workers are less productive and follow less training, but on the other hand exert more effort. Firstly, many researchers (Bassanini, Nunziata & Venn, 2009; Boeri & Garibaldi, 2007; Cappellari, Dell'Aringa & Leonardi, 2012; Damiani, Pompei, & Ricci, 2016; Hijzen, Mondauto & Scarpetta, 2013) find that an increase in the number of temporary or other flexible workers decreases productivity. Apparently, flexible workers are less productive then permanent workers. This might be due to mismatch between workers and firms (Cahuc, Charlot & Malherbet,

2016), which is accepted by the firms since they also pay a lower wage for these temporary workers. On the other hand, Hirsch and Müller (2012) show that a moderate use of agency workers can also increase productivity, but the effect becomes negative if a large proportion of the workers are agency workers.

Another channel through which temporary workers might get a decrease in wages are human capital investments. Arulampam, Booth and Bryan (2004) find with European data that temporary workers obtain less training. Damiani et al. (2016) find the same, and argue that this can also explain why temporary workers are less productive. Lucidi and Kleinknecht (2009) use Italian data to investigate this relationship, and find proof for a negative relationship between flexible jobs and productivity. They argue that a possible cause might be a decrease in training. Finally, it has also been found in the Netherlands that flexible workers are trained less (CBS & TNO, 2015). However, the authors argue that the amount of training depends on the quality of the match between employer and employee. In short, flexible workers obtain less training and thus invest less in their human capital, which might explain their lower productivity and wage.

On the other hand, it has been found that employment protection reduces the efforts of employees, resulting in a decline of productivity (Ichino & Riphahn, 2005). As temporary employees are protected less, it is likely that they work harder. This is indeed what Engellandt and Riphahn (2005) find in Switzerland. This might compensate the other factors which lead to a lower productivity of flexible workers. However, the literature supports the conclusion that flexible labour is less productive on the whole.

In the Dutch context, the relationship between the wage slowdown and flexible labour has been investigated by the Dutch governmental body of the CPB, the bureau for economic policy analysis. Among other things, they investigated the link between flexible labour and wages. Donker van Heel, De Wit & Van Buren (2013) found that most Dutch temporary workers would prefer a permanent job, but did not obtain one due to their bargaining position. Paans & Euwals (2018) analysed the link between flexibilization and wage growth by regressions on a panel consisting of different economic sectors, and they did find significant results for a negative impact of an increase in flexible workers on wage growth. However, they discount these results at length by invoking omitted variable bias and reversed causality in order not to take them at face value. Nevertheless, their research indicates that the link between the

number of flexible workers and the wage growth also exists in the Netherlands. To deepen the understanding of this link, this paper investigates the following research question:

Is the so-called flexibilization of the Dutch labour market responsible for the slowdown of the Dutch wage growth in the last decennia?

In order to answer this research question, exogenous variation in the number of flexible workers has to be identified. Some exogenous variation in this number is due to the introduction of two laws concerning flexible labour: one in 1998, which liberalized the rules concerning self-employment, and one in 2002, which made it much easier to fire workers on a temporary contract. In order to have a more precise estimate, a technique from the minimum wage literature is used: instead of defining a binary treatment variable (affected or non-affected), treatment is defined as the affected proportion of workers (on a continuous scale from 0 to 1), which is equal to the number of workers that is not in flexible employment. This is instrument is called a Bartik or shift-share instrument. This methodology is applied to data from 19 economic sectors in the Netherlands. The data covers the years from 1995 to 2017. This research finds that the introduction of the *VAR* (*Verklaring Arbeidsrelatie*), a relaxation of the legislation on self-employment, led to a decrease in the wage growth of 0,84%. On the other hand, the *WFZ* (*Wet Flexibiliteit en Zekerheid*), a relaxation in the laws on temporary labour, led to an increase in wage growth of 2,28%. However, the growth in compensation, which includes social contributions, was much smaller. The overall effects on wage growth are negative. This is probably linked to the increase in market power of employers. This increase in market power might also explain why the earlier *WFZ* has positive effects, whereas the later *VAR* negatively affects wages. Flexibilization gave employers the legal tools to use their market power to drive down wages, whereas the benefits of flexibility were initially shared by employers and employees. By the use of *zzp'ers* (self-employed contractors), employers use the less visible channel of social contributions to reduce their wage costs. However, the later data show that also the wage growth itself declined. It can therefore be concluded that the flexibilization of the Dutch labour market led to a decrease in the wage growth.

Data

The data have been obtained from the digital database of the CBS, the Dutch National Statistical Office. They concern 19 economic sectors on the 1-digit level of the SBI-2008, the classification of economic

sectors. They cover the years from 1995 to 2017, although not all variables and sectors are covered for the entire timespan. Therefore, the regressions use an unbalanced panel.

The dependent variables are the hourly wage, hourly compensation and hourly wage costs. These three variables are all closely related to the earnings of the employee. The hourly wage is the total wage the employer is due to the employee, and excludes the social contributions paid by the employer. The hourly compensation, however, does include the social contributions paid by the employer. On top of that, the wage costs finally also take into account final taxes paid and wage cost subsidies received by the employer.

The main independent variable is the proportion of permanent labour. The proportion of permanent labour is defined as the proportion of workers in a sector that is not working as a self-employed worker or a worker on a flexible contract. A flexible contract is a temporary contract (for instance for 1 year) or a contract with flexible hours, for instance agency work. In principle, all other workers are permanent workers.

In 2003, there has been a change in the classification of economic sectors. Moreover, since then workers working less than 12 hours a week have been included in the data on employment. In order to deal with this, Paans & Euwals (2018) recoded and rescaled the data on flexible labour, which they kindly provided.

On top of that, the sectoral data contain information on the level of education, age distribution and gender distribution. These data have been recoded and rescaled as well. Furthermore, the data cover productivity and the price level. Productivity is calculated on the basis of consolidated production and is sector-specific. The price level is not calculated per sector, but refers to the economy-wide change in consumer prices. These two variables are necessary to decompose the wage growth into a productivity compensation, inflation compensation and bargaining power share.

Since the data on flexible labour are non-stationary, the first differences of the variables have been used. Moreover, since the relationship is probably of a relative nature, the logarithm of the variables is used, rather than their absolute value.

Table 1

Descriptive statistics per sector

		Flexible labour			Compensation per hour	
		All	Temporary contracts	ZZP		
Sector		Mean	Mean	Mean	Mean	Std. Dev.
1	Agriculture, horticulture and fishing	56,3%	17,9%	38,3%	18,96	2,89
2	Mining	12,0%	12,0%	0,0%	51,13	9,83
3	Industry	16,0%	12,9%	3,2%	27,36	5,26
4	Electricity, natural gas, steam and cooled air	13,1%	12,6%	0,5%	39,70	6,58
5	Water and waste management	15,2%	14,0%	1,2%	27,46	4,58
6	Construction	24,3%	9,0%	15,3%	27,43	4,88
7	Wholesale, retail and car reparation	26,7%	20,3%	6,3%	22,83	3,98
8	Transport and storage	23,0%	18,8%	4,2%	26,10	4,22
9	Lodging and catering	46,2%	40,7%	5,5%	17,12	2,10
10	Information and communication	27,4%	15,1%	12,3%	33,77	6,39
11	Financial institutions	13,9%	10,0%	3,9%	41,81	9,38
12	Real estate	19,7%	9,6%	10,0%	33,53	5,37
13	Consulting, research and other specialized business services	32,9%	11,6%	21,3%	35,74	6,53
14	Renting of movables and other business services	30,9%	24,2%	6,7%	19,04	2,97
15	Government	9,7%	8,8%	0,9%	33,08	7,10
16	Education	19,9%	13,9%	6,0%	32,30	6,13
17	Health and welfare care	19,8%	14,9%	4,9%	27,17	5,47
18	Culture, sport and recreation	53,7%	22,0%	31,8%	25,81	3,25
19	Other services	39,0%	14,0%	25,0%	24,14	4,73

Notes. The data have been obtained from the CBS. The sectors cover the entire Dutch economy in the years 1995 until 2017. The data is not fully complete: for 1995 and 2017, there is often no data available. *Temporary labour* covers all temporary contracts, flexible contracts, agency work etc. *ZZP* or self-employment covers all self-employed individuals without personnel. Compensation per hour is the most important outcome variable, and is highly correlated with wages and wage costs per hour.

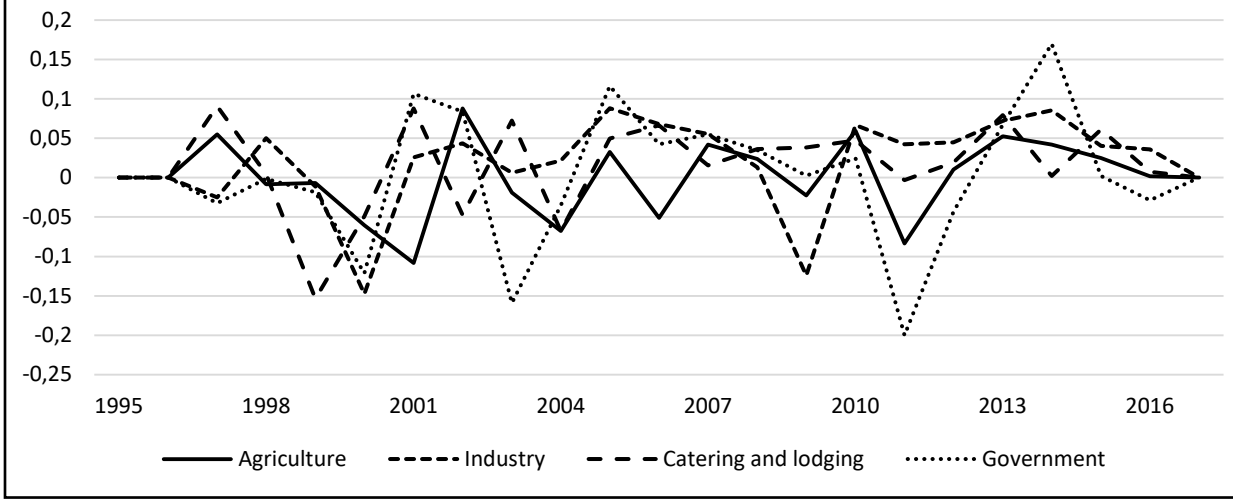
Table 1 shows the descriptive statistics on flexible labour in the different sectors. The table shows that there is quite some variation in the proportion of flexible labour. Some sectors, for instance agriculture, have a high average level of flexible labour of 56,3% of the workforce. This sector traditionally used a lot of flexible labour, and experienced a smaller increase in flexible labour than other sectors. Moreover, this sector mainly employs self-employed farmers, but also has quite some temporary contracts. On the other hand, the sector government employs little flexible labour, on average just 9,7%. And if the government uses flexible labour, it mainly concerns temporary contracts. It turns out that the make-up of flexible labour is quite different in different sectors. On one hand, most sectors have started to use

flexible labour since the legal liberalization, but self-employment is only prevalent in some sectors. The differences between self-employment and temporary contracts might explain some of the wage dynamics.

The table also shows the descriptive statistics of the level of hourly compensation, the preferred specification of the wage level. There is quite some variation in this compensation. Some sectors, such as lodging and catering, have a quite low average wage of €17,12 with a standard deviation of only 2,10, whereas sectors such as the financial institutions are remunerated much better with an average wage of €41,81. However, there is also more variation in the sectors that are remunerated better. The data show that it is necessary to control for initial differences in the wage level and proportion of flexible workers, since the initial level of flexible workers and average compensation are correlated.

Figure 1

Δ flexible labour in some sectors



Notes. The data used concern the index of change: the change in the amount of flexible labour as a percentage of the share of flexible labour. The four sectors are not entirely representative for the whole dataset.

Figure 1 illustrates the development of flexible labour over time, by showing how fast the amount of flexible labour changed in different sectors. On one hand there is the agricultural sector, that initially had a high level of flexible labour, and show quite some yearly variation in the change in flexible labour, but the average change approximates zero. Although the government had a lower level of flexible labour to start with, it follows a comparable pattern, though there is some growth in flexible labour in the 2000s. This is indicative of the use of flexible labour as a kind of buffer, that can be laid off in bad

times. The negative spikes in 2003 and 2011 indicate this. On the other hand, the industrial and the catering & lodging sectors started out with a lower level of flexible labour, but experienced, despite some variation, a marked increase over time in the share of flexible labour. It is probable that this increase is to a certain extent due to the liberalization of the laws regarding flexible labour.

Methodology

As Paans & Euwals (2018) explained, it is not easy to find exogenous variation in the wages and proportion of flexible labour. A naïve regression is likely to suffer from omitted variable bias. More sophisticated statistics might as well be subject to reverse causality: not only the introduction of flexible labour might lead to lower wages, but a high level of wages might as well induce managers to use more flexible labour in order to reduce them. It is thus crucial to find a credible source of exogenous variation.

Therefore, this research uses only the effects of the introduction of two Dutch flexible labour laws to avoid reverse causality, and a fixed-effects design to avoid omitted variable bias. Both laws were the result of the political desire to reform the labour market and make it more flexible. This desire was not the fruit of a certain level of flexible labour, but of the promises of policy economists that making the labour market less rigid would lead to more welfare. This rules out reverse causality. The fixed effects eliminate any time-invariant omitted variable bias. As a result, biased outcomes are much less likely.

The first law, introduced in 1998, is called *Wet Flexibiliteit en Zekerheid* (*WFZ,* Law Flexibility and Security). This law was aimed at temporary labour and contains several important changes. An important change concerns the so-called chain rule: if more than three temporary contracts, or two temporary contracts for a duration longer than three years were consecutively handed out to a single employee, the last contract would automatically become a permanent contract. Moreover, it was no longer necessary to formally dismiss a temporary employee if his contract was not renewed. This reduction in the legal and administrative burden on firing a temporary employee made temporary employees much more attractive. On top of that, the legal status of agency work was normalized: the work agency permit was abolished, an agency contract became another flexible work contract and agency workers had to be paid the same as their colleagues with permanent contracts. In sum, this law made flexible work much easier to use and has most probably led to an increase in the use of temporary employees.

The second law was introduced in 2001, and is called the *Verklaring Arbeidsrelatie* (*VAR,* Clarification of the Labour Relationship). This law intended to make self-employment more attractive by providing ex-ante certainty about the fiscal status. If the fiscal authorities hand out a VAR to someone, this means that he is entitled to the fiscal status of self-employment and the associated fiscal benefits. Prior to this law, it was often unclear whether or not someone could obtain and keep the fiscal status of self-employment. This certainty made the change to self-employment much easier. On top of this, it is important to notice that this law was changed in 2005.

Whereas these two laws provide exogenous variation in the level of flexible employment, a binary variable indicating whether or not the law is in effect is still a rather rough estimator of its impact. In order to obtain a more precise impact estimator, this research uses a so-called Bartik instrument. The Bartik instrument is named after Bartik (1991), and received a lot of attention recently (for instance of Goldsmith, Sorkin & Swift, 2018; and Jaeger, Ruist & Stuhler, 2018). The Bartik instrument applies to a situation where a global shock hits a population in different locations or industries, and these locations are affected differently based on the share of the population that has certain characteristics. Therefore, it is also called the shift-share instrument.
In this case, the national shocks are the two afore-mentioned legal changes, whereas the different economic sectors are affected differently, due to different shares of affected workers (in a certain sector). Card (1992), who was another pioneer of this approach, used the proportion of workers who earned less than a new, higher minimum wage as the affected group. Only their wages had to be increased directly as a result of the minimum wage increase. This research uses the proportion of workers on permanent contracts as the affected share of workers.

After all, the aforementioned laws did not directly affect the wages for flexible labour. They rather made flexible labour a more attractive option. Therefore, they only affect the wages through an increase in the number of flexible labourers. And since only the workers on a permanent contract have the choice to change to flexible labour, sectors with relatively more permanent workers will be affected more. This implies that the treatment status or Bartik instrument T_{jt} of a sector j is as follows:

$$T_{jt} = p_{jt} * t_i \ (1)$$

Where p_{jt} denotes the proportion of permanent workers in sector j at time t, and t_i whether law $i = 1,2$ is in effect. It is assumed that a law starts to affect the labour market in the year after its

introduction. The share of permanent workers is not kept fixed but updated, which is possible if the error term of equation (2) is not structurally correlated over time.
Some of the specifications do not use the proportion of flexible labour as the determinant of treatment T_{jt}, but use instead a binary indicator indicating whether or not the sector had an initial level of flexible labour over 50%. The sectors which had less flexible labour are in that case considered the treatment group.

There are different ways to implement a Bartik instrument regression design. One can use an IV regression, or an ordinary regression design which is numerically equivalent (Goldsmith, Sorkin & Swift, 2018). This research uses a fixed effects regression design, using time and industry fixed effects. Strictly speaking, the Bartik instruments are therefore the aforementioned treatment status times the time fixed effects. However, this is not so relevant in the context of the fixed-effects design. In this design, one takes the differences over time of the different sectors, thereby eliminating any initial differences. One does not compare the initial level of wages of the control and treatment group, but only their change over time. This regression takes the following form:

$$\Delta lnY_i = \alpha + \beta_1 T_{jt} + \beta_2 X_j + \varepsilon_{ipt} \quad (2)$$

Where X_j represents the sector fixed effects, C_{jt} the time-varying controls and ε_{ipt} the error term. Y_i is the dependent variable, and represents in the different specifications either wages/hour, compensation/hour, wage costs/hour or the labour share.

It is important that the Bartik instrument T_{jt} is not biased. As Goldsmith et al. (2018) explain, the exogeneity of the instrument does not depend on the level of the outcome. This is an important distinction, since it is likely that the share of permanent workers and the wage growth in a certain industry are correlated. But the question is rather whether the change in the outcome (wage growth) is correlated with the share of permanent workers, as time and industry fixed effects are included. Whereas it is probable that wage growth is correlated with the share of permanent workers, it is not likely that the change in wage growth is correlated as well. The change in wage growth probably depends on exogenous conditions, for instance on the business cycle.
Moreover, as Jaeger, Ruist & Stuhler (2018) argue, it is important that there are no industrial conditions correlated with the share of permanent workers and the outcome variable. This is not likely for the same reason. Moreover, this assumption is checked by equation (4).

As Van Tilburg & Suyker (2018) argued, it is helpful to decompose wage growth in compensation for inflation, allocation of changes in labour productivity and a resulting change in the wage share. Since the price level and labour productivity vary over time, they are not accounted for in the fixed effects design. Therefore, most specifications account for inflation and productivity changes and focus on the effects on the wage share. This yields the following equation:

$$\Delta lnY_i = \alpha + \beta_1 T_{jt} + \beta_2 X_j + \beta_3 \Delta lnC_{jt} + \varepsilon_{ipt} \ (3)$$

Where C_{jt} represents inflation and the changes in productivity.

In order to check the assumption that the fixed effects absorb all relevant differences, a regression is carried out that adds the demographic controls of the distribution of gender, age and education in the different sectors. This yields the following equation, where D_{jt} represents the demographic controls.

$$\Delta lnY_i = \alpha + \beta_1 T_{jt} + \beta_2 X_j + \beta_3 \Delta lnC_{jt} + \beta_4 \Delta lnD_{jt} + \varepsilon_{ipt} \ (4)$$

There are still some concerns with the aforementioned methodology. One is that both laws overlap in time: after 2001, both affect the number of flexible workers and the wage. Therefore, two additional regressions are carried out: one focuses on the *WFZ* and the period before 2001, the other on the *VAR* and the period after 1999, when the *WFZ* came into effect. This should isolate their variation from the influence of the introduction of the other law. Another is that the laws might not have immediate effects, but rather take some time to influence the behaviour of organizations. Thus, some regressions control for the different lags of the variables.

Finally, as another check some regressions control for the leads of the variables. There might be some anticipation effect on the behalf of firms, which could escape the regressions if we only use the lags of treatment.

Results

This section presents the estimation of the effect of the introduction of the two flexible labour laws on the different specifications for the wages. Firstly, three estimations for the hourly compensation are presented, as our preferred specification of the wage level. In the first place, a fixed-estimation without

controls is presented, then one modelling the wage decomposition, which includes inflation and changes in productivity, and finally one also including time-varying demographic controls. Furthermore, the estimations of the effect on the other wage variables are discussed. On top of that, several regressions are presented that use a shorter timespan to isolate the effects of the two laws from each other.

Then, the section proceeds with the regressions featuring lags of treatment, to check whether the effects of the laws maybe come into play later. Finally, the section concludes with a sensitivity analysis featuring the leads of treatment.

Table 2
The effect of the liberalization of flexible labour on compensation per hour

	Fixed-effects regression			
	Binary treatment		**Proportional treatment**	
Compensation/hour	WFZ	VAR	WFZ	VAR
Treatment	-0.00188	-0.00813***	0.000364	-0.00771***
	(0.00171)	(0.00120)	(0.00202)	(0.00155)
Constant	0.0121***	0.0152***	0.0109***	0.0152***
	(0.00128)	(0.000812)	(0.00137)	(0.000951)
Decomposition	No	No	No	No
Demographic controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	418	418	392	392
R-squared	0.003	0.104	0.000	0.063
Number of sectors	19	19	19	19

Notes. Fixed-effect regressions estimated with time and industry fixed effects, no other controls included. The outcome variable is measured as the Δ ln of compensation/hour. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The first regressions focus on the hourly compensation, and assume that there are no time-varying variables that can confound the regression. Table 2 reports the results of these regressions. The first panel concerns the specifications where treatment is binary: sectors with many initial workers are not treated at all, whereas sectors with few initial flexible workers are considered as the treated group. According to this regression, the effect of the *WFZ* on wages was negative, but insignificantly so. On the other hand, the introduction of the *VAR* had a significant negative effect on the hourly compensation: the yearly change of compensation decreased by 0,813%.

The proportional regressions yield a comparable result: the *WFZ* has no significant results, and the *VAR* is estimated to affect the yearly change in compensation by 0,771%; assuming a 100% difference in

affected labourers. However, as it is unlikely that the assumptions of this regression hold, it is important to also analyse these relationships whilst controlling for inflation and changes in productivity.

Table 3
The effect of the liberalization of flexible labour on compensation per hour

	Fixed-effects regression with decomposition			
	Binary treatment		**Proportional treatment**	
Compensation/hour	WFZ	VAR	WFZ	VAR
Δ ln Productivity	0.165***	0.141***	0.188***	0.165***
	(0.0382)	(0.0377)	(0.0377)	(0.0380)
ln Inflation	0.858***	0.485***	0.908***	0.729***
	(0.157)	(0.178)	(0.154)	(0.165)
Treatment	-0.00327	-0.00696***	-0.00132	-0.00550***
	(0.00220)	(0.00164)	(0.00258)	(0.00201)
Constant	0.00574***	0.0104***	0.00382*	0.00752***
	(0.00213)	(0.00216)	(0.00216)	(0.00216)
Demographic controls	No	No	No	No
Fixed Effects	Yes	Yes	Yes	Yes
Observations	312	312	306	306
R-squared	0.152	0.196	0.172	0.193
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 3 reports the results of these preferred specifications. Both the changes in productivity and the inflation have a highly significant impact on the change in the wages. Interestingly, it is estimated that inflation is not fully compensated in wage increases, but only between 48,5% and 90,8%. The same holds for productivity increases: a 1% productivity increase is only rewarded by a wage increase between 0,14% and 0,19%. This adds to the research of Stansbury and Summers (2017), that productivity and pay are no longer correlated strongly.

The results show that controlling for these important factors reduces the impact of the laws, but that the effects of the laws are nevertheless comparable. Both the binary and proportional specification of the *WFZ* yield insignificant results. Therefore, this specification indicates that the *WFZ*, or the change in temporary labour contracts, did not significantly affect the hourly compensation of employees. On the other hand, the estimated effect of the *VAR* is smaller than without controls, but still -0,696% for the

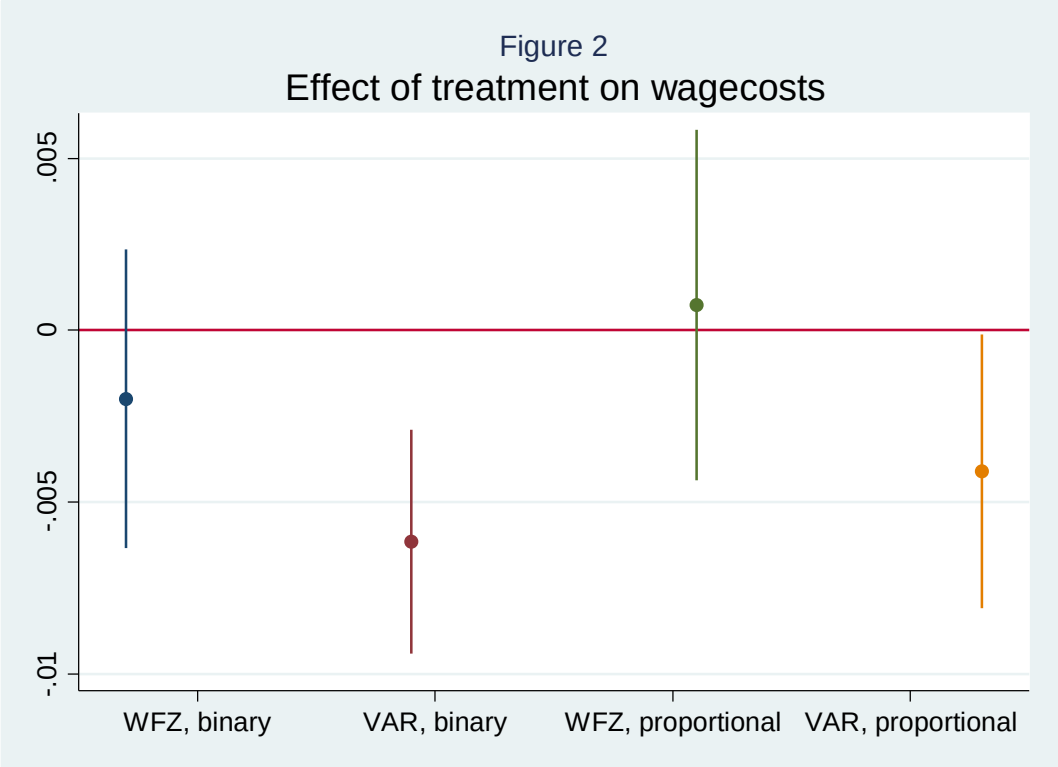
binary treatment specification and -0,550% for the proportional one. Therefore, it the increase in self-employment that was induced by the *VAR* reduced the increase in hourly compensation.

Table 4
The effect of the liberalization of flexible labour on compensation per hour

	Fixed-effects regression with decomposition and controls			
	Binary treatment		**Proportional treatment**	
Compensation/hour	WFZ	VAR	WFZ	VAR
Δ ln Productivity	0.0819*	0.0587	0.0915**	0.0694
	(0.0458)	(0.0456)	(0.0460)	(0.0466)
ln Inflation	0.926***	0.746***	0.920***	0.870***
	(0.150)	(0.166)	(0.150)	(0.161)
Treatment	0.000885	-0.00412**	0.00384	-0.00193
	(0.00236)	(0.00174)	(0.00273)	(0.00216)
Constant	0.00103	0.00553***	-0.000855	0.00322
	(0.00218)	(0.00212)	(0.00226)	(0.00221)
Demographic controls	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes
Observations	259	259	259	259
R-squared	0.232	0.250	0.238	0.234
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables and demographic controls are included. Demographic controls include: Δ ln Gender, Δ ln age 15-25%, Δ ln age 25-35%, Δ ln age 35-45%, Δ ln age 45-55%, Δ ln age 55-65%, Δ ln Low education, Δ ln Medium education. The outcome, demographic and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. However, for quite some observations demographic information is missing. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

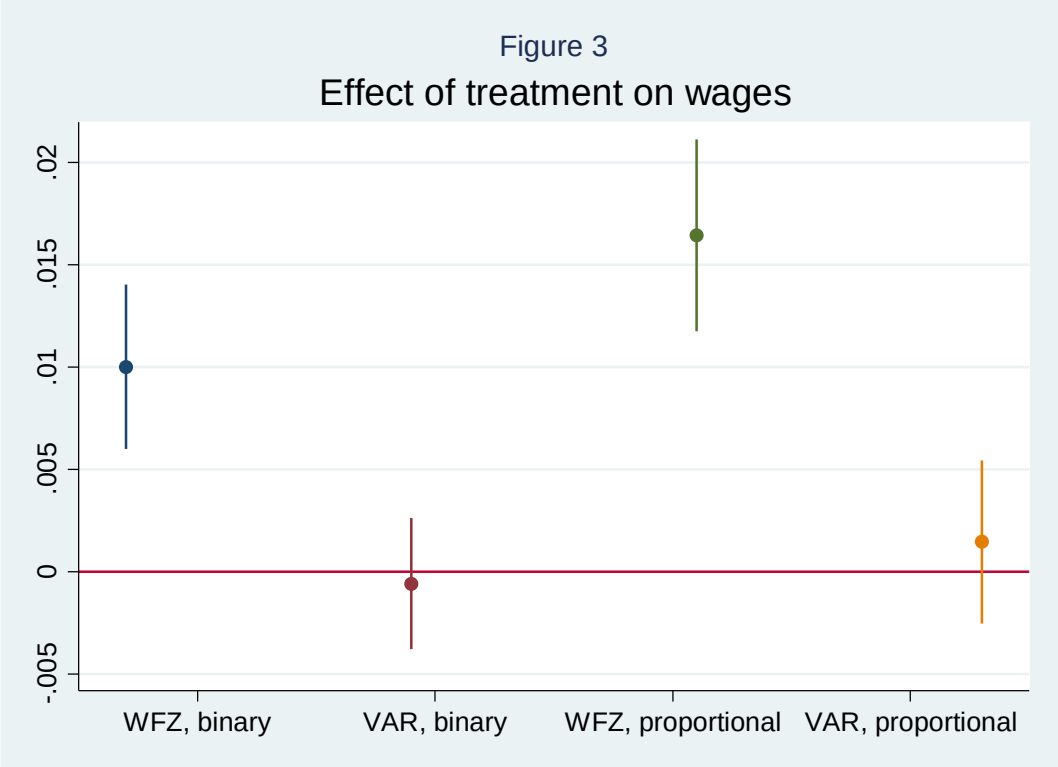
Table 4 presents, as a sensitivity check, the estimation of the effect of both laws controlled for the demographic make-up of the sectors. It turns out that these time-varying controls do not have a significant impact on the change in the hourly compensation. An increase in the proportion of males is completely insignificant. On top of that, it is quite surprising that an increase in the number of people of any age group is correlated with higher wages, even though only the results for the 15-25 and 55-65 year olds are significant. Apparently, an increase in the proportion of older workers (65-75 years old) depresses the wage growth. Furthermore, the change in the proportions of different education levels does not have an significant impact on the wage growth. Moreover, in this regression the significance of labour productivity decreases, and the only treatment specification which remains significant is the binary specification of the *VAR.* In short, these controls yield insignificant results and mostly add noise to the regression. Therefore, they are not very useful and a parsimonious regression specification is preferable.



Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Table A1 shows the full results.

Figure 2 presents the same regressions as Table 3, but they now use wage costs per hour as the dependent variable. It turns out that the relationship between flexible labour and wage costs is quite comparable to the relationship between flexible labour and compensation. Again, productivity changes are estimated to be only compensated by 14-20%, and inflation is accounted for between the 45% and 95%. Most importantly, the results for the effects of the legal changes are quite comparable. The *WFZ* again has no significant impact at the wage specification, as the confidence interval also includes 0. The estimate is therefore not significantly different from zero. The *VAR* on the other hand is again estimated to negatively impact the change in wage costs. However, the impact on wage costs is somewhat lower than the impact on compensation: in the binary specification only -0,615% , and in the proportional specification just -0,411%. Apparently, wage subsidies and final taxes somewhat compensate the reduction in the change in hourly compensation. Conclusively, these results support the conclusion that the increase in self-employment decreased the wages.

Figure 3



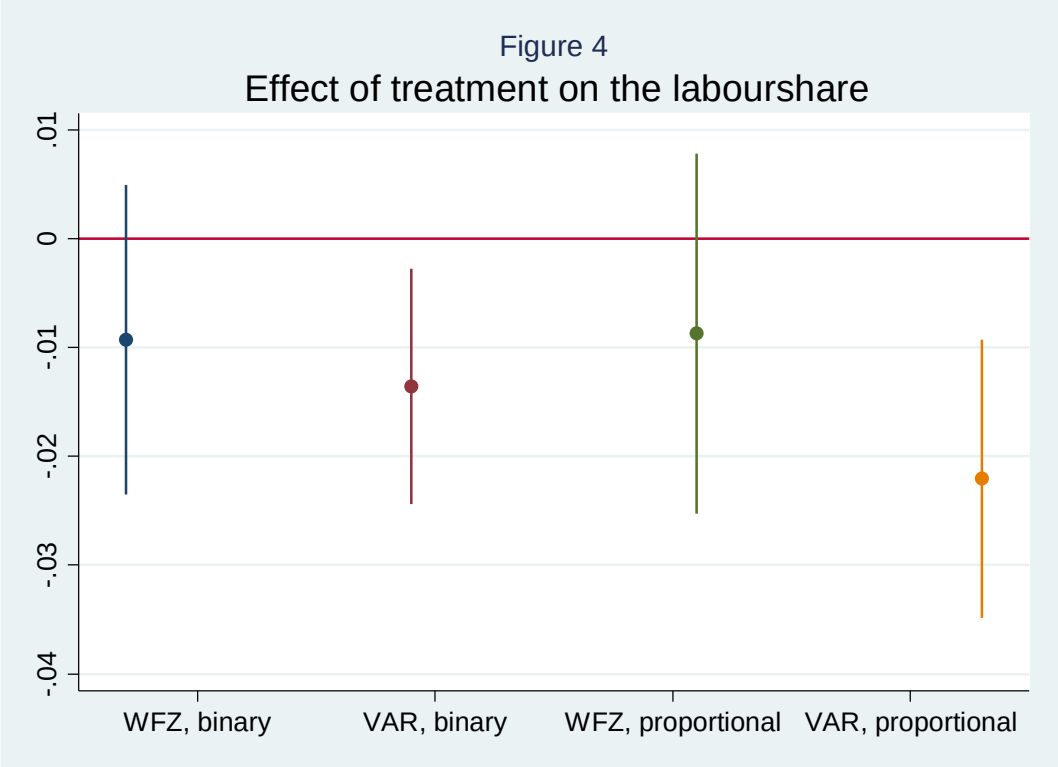
Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Table A2 shows the full results.

As Figure 3 shows, the picture differs somewhat for wages per hour. Whereas productivity changes are estimated to have a comparable impact, inflation is now consistently estimated to be accounted for by some 70-80%. More importantly, there is no significant negative effect on wages of the legal changes at all. On the contrary, the *WFZ* is estimated to significantly increase the yearly change in wages: by 1% in the binary specification, and by 1,64% in the proportional one. The effect of the *VAR*, however, is estimated not to significantly differ from zero, as both confidence intervals show.

Even though these results might seem contradictory with the aforementioned results at the first sight, they can be reconciled without trouble. The different specifications of the wage represent different components of the total wage. Whereas the wage itself increased due to the *WFZ,* it decreased the social contributions paid by employers. As a result, the complete result is insignificant in the hourly wage costs and compensation regressions. With respect to the *VAR*, it seems that it did not decrease wages per se. It rather decreased the social contributions paid by employers, and reduced the increase

in hourly compensation in that way. Apparently, self-employment became a way to evade the payment of social contributions, without any compensation for employees in their wages.

Figure 4



Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Table A3 shows the full results.

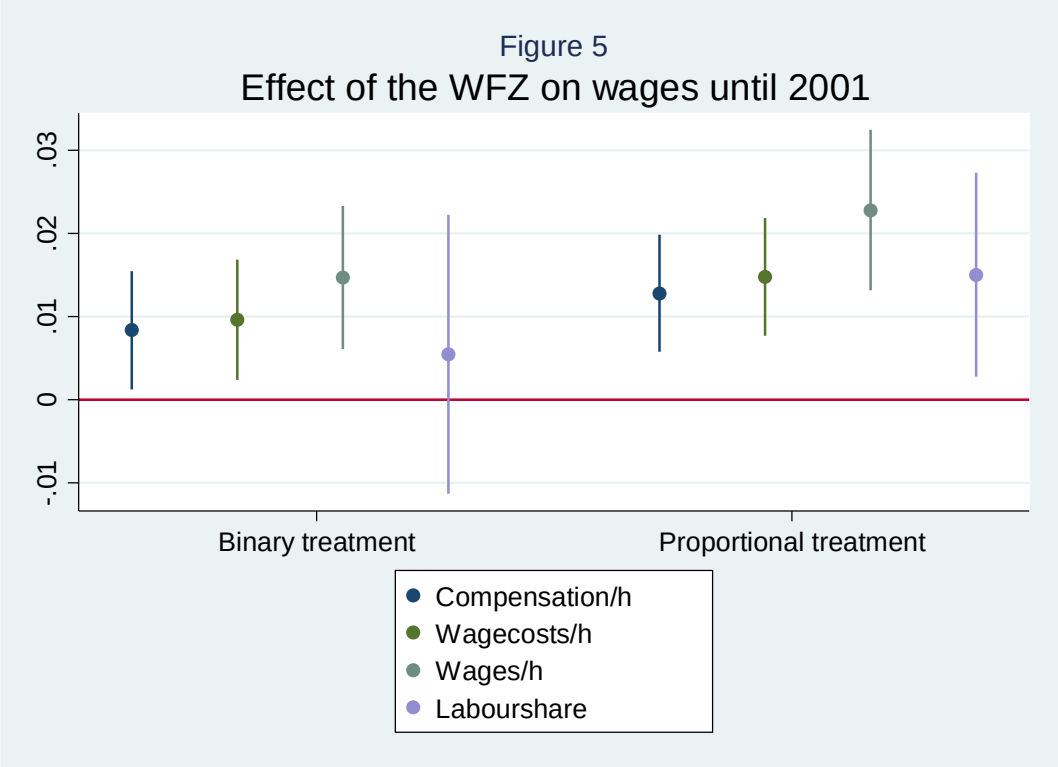
Another issue which requires attention, is the impact of the flexibility laws on the labour share. As it has been shown that the introduction of the *VAR* led to a decline in the wage growth, whereas the *WFZ* did not have an impact, it is also of interest whether this had an impact on the change in the labour share. Figure 4 shows the results of the estimation of this effect. Interestingly, table A3 shows that increases in productivity have a significant negative impact on the change in the labour share. This suggest, in line with the regressions presented above, that most of the productivity gains are reaped by the owners of capital. On top of that, inflation decreases the labour share, though it is only significant in the regressions concerning the *VAR*. This suggests that workers are not compensated for inflation, since the estimates are approximately lower than 1.

In line with the earlier results, only the introduction of the *VAR* did have a negative impact on the labour share, whereas the *WFZ* did not have any significant impact. The estimates range from -1,36% to -2,21% in case of full exposure to the legal changes. This implies that the *VAR* and the possibility of becoming self-employed exert downward pressure on the development of the labour share. In other words, the decrease in wage growth led to a corresponding change in the development of the labour share.

However, these conclusions are dependent on the way the labour share is computed. As Elsby et al. (2013) proved, the precise magnitude of the labour share depends to a large extent on the imputation of self-employment income. The Dutch Statistical Office (CBS) imputes all income of the self-employed to the labour share. However, self-employed workers are entrepreneurs, and it might actually be preferable to impute some part of their income to capital income. Since the number of self-employed workers has risen significantly in the Netherlands, especially after the introduction of the *VAR,* the imputation of the CBS might distort the picture of the "true" labour share. Therefore, a change in the imputation rules might alter these conclusions.

As the laws overlap in time, evaluation the whole time period might confound the effect of the two different laws. Therefore, some regressions have been carried out that only focus on one time period: one on the period before the introduction of the *VAR*, evaluating the *WFZ*, and another after the introduction of the *WFZ*, evaluating the *VAR*.

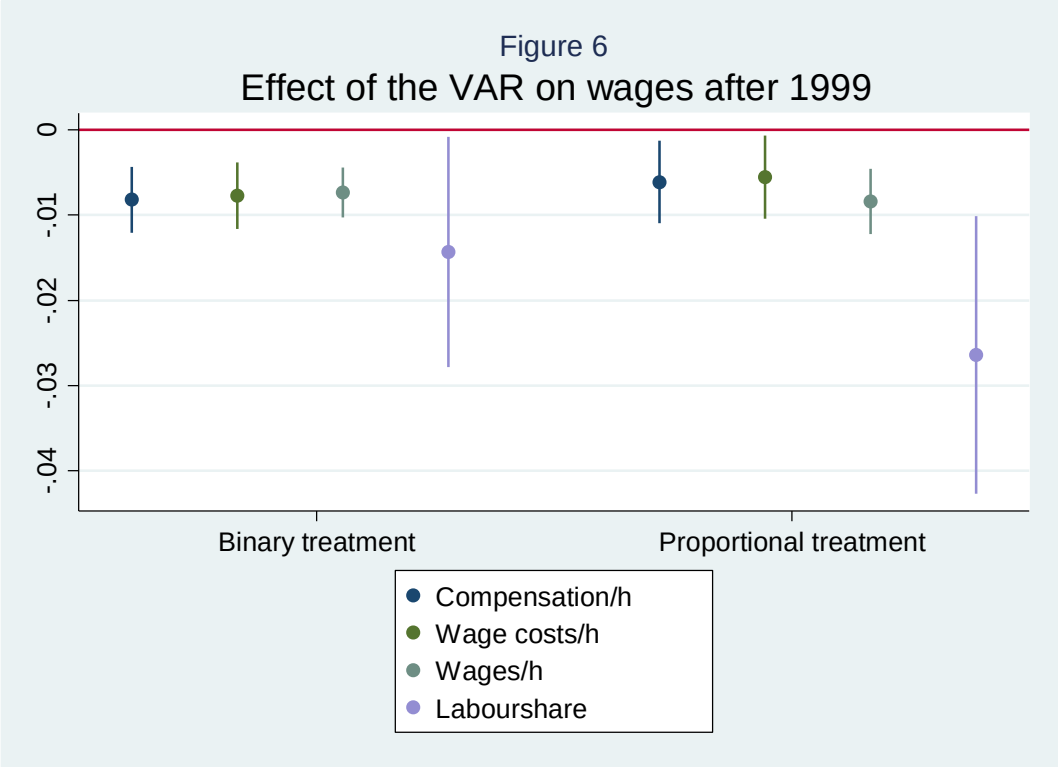
Figure 5



Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of temporary labour. Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Table A4 shows the full results.

Figure 5 shows the results for the variable of interest for the regressions concerning the *WFZ*. They concern the period until 2001, when the *VAR* was not yet in effect. There are significant differences between these results and the regressions concerning the entire time period. Nevertheless, the regressions align with the results in figure 3. It is remarkable that all estimates for the various wage specifications are positive and significant, excepted the binary specification for the labour share. This implies that the *WFZ* did not only have a significant positive impact on wages itself, but also on social contributions. However, the impact on the wage change of 2,28% is bigger than the impact on for instance the wage costs, which is only 1,48%. The results of the proportional treatment variable are nearly the same as when we use the percentage that is not in temporary labour, which can be found in the appendix in table A5. The results imply that the impact on social contributions is smaller, and that the *WFZ* mainly affected wages. This supports the idea that flexible labour is compensated in higher wages, but on the other hand leads to lower contributions to social security.

Figure 6



Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *VAR* was a major liberalization of self-employment. Estimated on the panel of 19 economic sectors and 7 years, from 1999 until 2017. Productivity information is however missing for several observations. Table A6 shows the full results.

When we consider the picture of the *VAR* after 1999, we see the opposite results. Figure 6 shows the regressions coefficients and their confidence intervals for the main variables of interest, the different wage specifications. All coefficients are negative and significantly different from zero at the 1% level. The usual wage specifications all indicate, irrespective of the use of the proportional or binary treatment, a decrease in the wage growth due to the *VAR,* ranging from 0,55% to 0,84%. The effects on the labour share are even bigger: a decrease of 2,64% according to the proportional specification. Table A7 shows the results for the regressions that use the percentage that is not in self-employment rather than all flexible labour, as a check. Weirdly, these regressions produce positive and statistically significant results, but the coefficients are extremely small. Most probably, this anomalous results is due to the fact that the self-employed are heavily concentrated in some sectors, such as agriculture and culture. The combination of this with sector fixed effects in one regression is unable to significantly distinguish these two things. Moreover, temporary employees probably have little opportunities to

become self-employed to increase their wages. In short, the liberalization of self-employment led to a significant decrease in the wage growth.

Usually, the behaviour of organizations and individuals does not immediately adapt to a new law, but it takes some time to change behaviour. To capture this fact, the impact of the laws is measured from the year after their introduction on. However, it might also very well be that the decision processes itself take some time. Individuals that want to become self-employed, or organizations that want to change the composition of their workforce, need some time to take these decisions and implement them. Therefore, the lagged regressions up to three lags of the different regressions specifications are presented below. The number of lags which is preferred with respect to the lowest Akaike information criterion (AIC) is presented; the full overview of all lags can be found in the appendix. With respect to the *WFZ,* only the two first lags have been evaluated, due to the fact that many observations will drop out otherwise.

Table 5
The effect of the liberalization of flexible labour on compensation per hour

	Fixed-effects regression with lags			
	Binary treatment		**Proportional treatment**	
	WFZ	VAR	WFZ	VAR
Optimal number of lags	2	1	1	1
Δ ln Productivity	0.122***	0.156***	0.170***	0.148***
	(0.0365)	(0.0381)	(0.0376)	(0.0375)
ln Inflation	0.736***	0.838***	0.880***	0.394**
	(0.149)	(0.157)	(0.152)	(0.181)
Treatment	0.00302	0.00297	0.00831**	0.00614*
	(0.00336)	(0.00355)	(0.00389)	(0.00355)
1st lag	0.00904**	-0.00669**	-0.0108***	-0.0145***
	(0.00389)	(0.00300)	(0.00330)	(0.00367)
2nd lag	-0.0171***			
	(0.00288)			
Constant	0.00722***	0.00599***	0.00456**	0.0114***
	(0.00201)	(0.00212)	(0.00214)	(0.00232)
Fixed Effects	Yes	Yes	Yes	Yes
Observations	312	312	305	305
R-squared	0.257	0.208	0.198	0.231
AIC	-2029.691	-2012.03	-1983.103	-1995.903
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome (compensation/hour) and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several

observations. Tables A8-A11 show the full regressions. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The lagged regressions show some interesting information. In general, the effects of the introduction of the law are certainly lagged. In case of the *WFZ*, both in the proportional and the binary method, there first is a small positive effect, which than is countered by a bigger negative effect. The main difference is that in the binary equation 2 lags are optimal based on the AIC, whereas only 1 is in the proportional treatment design. Apparently, flexible labour initially boosts wage growth, but this trend is then reversed in the next year.

The lags of the *VAR* show a more coherent picture. Whereas the significance of the immediate effect decreases, the first lag is highly significant and negative. Though here as well an off-setting effect might be present, the first lag has a much stronger effect. The combined effect of the immediate effect and the first lag comes close to the magnitude of the complete effect found in the regressions before. Conclusively, the effects of the legal changes on wage growth are apparently lagged. Nevertheless, they correspond to the earlier results: the *VAR* has a total negative impact on wages, whereas the evidence on the *WFZ* is mixed.

As a sensitivity test, it is also useful to control for leads. If the leads are significant, something else might be at play and another development might distort the results. Several regressions have been run to check whether it is useful to include leads. In order to check the optimal number of leads, the Bayesian information criterion has been used as criterion. However, the BIC indicates that the optimal specification does not include any leads. Therefore, it turns out that anticipating effects do not threaten the credibility of the design.

Conclusion and discussion

This research uses Dutch industry-level data on the wage growth and proportion of flexible labour in the last two decades to provide evidence for a negative relationship between the increase in flexible labour and the wage growth. The introduction of two laws that relaxed the use of flexible labour, corrected for the exposure per sector, are used as Bartik instruments. These Bartik instruments are preferable to a binary specification of treatment. Specifically, the regressions find that the *WFZ*, concerning temporary labour, had a positive impact on wage growth, whereas the *VAR,* concerning self-employment, had a negative impact. There are some caveats with the first result: the effects of the *WFZ* on social

contributions are much lower, and if the entire timespan is used the results become smaller and insignificant for the variable that includes social contributions.

This could be ascribed to a mix-up with the effects of the *VAR*, but it is likely that more is going on. After all, the general results for the impact of the *VAR* are significantly negative. It is rather the case that employers started to use flexible labour differently over time. After the first legal relaxation of flexible employment, the benefits of more flexible employment were shared with employees and led to an increase in their wages. However, over the years employers started to use flexible labour as a way to economize on wage costs, thus reducing the wage growth of employees. Specifically, self-employment is used as a way to avoid the payment of social contributions, since the self-employed are not entitled to social security. Since many social contributions are paid directly to the state by the employers, reducing them is often hardly perceived by employees, and thus easier achieved. The resulting, poorly visible lack of social security is therefore not or imperfectly compensated by the employers. As a result, 25% of the self-employed in the Netherlands have no back-up if they would become disabled, and would have to rely on the minimal social assistance (Berkhout & Euwals, 2016). In short, the legal relaxation concerning flexible labour has eroded the social security of employees, and to a lesser extent their wages.

The fact that firms have the opportunity to reduce the growth of wages and social contributions, suggests that they have significant market power. Moreover, the fact that only the later years yield significant negative results, might imply that their market power has increased in the last years. This is comparable to the findings of Benmelech, Bergman & Kim (2018), who found a negative relationship in the United States between increasing monopsony power and the wage level in the last decades. The relaxation of labour laws then offers firms a legal opportunity to use their market power and economize on wages.

This interpretation is supported by the whole of the regressions. The results for the earlier (until 2001) *WFZ* are positive, whereas the results for the later *VAR* (after 2001) are negative. Regressions on the entire timeframe, which will somewhat confuse the impact of the *VAR* and the *WFZ* after 2001, show an overall negative effect on compensation, whereas the positive *WFZ* effect remains somewhat significant for wages. This implies that there is some overall wage growth by the *WFZ*¸ but that the overall effect of flexibilization on social contributions was negative. Flexibilization also engendered a decrease in the labour share. Overall, it can be concluded that the two laws which led to a major flexibilization of the

labour market in the Netherlands, reduced wage growth, and especially the payment of social contributions.

The results hold for several specifications of the wage and the time frame, and are robust to several sensitivity checks. Moreover, the possible biases that Paans & Euwals (2018) notice have been successfully addressed. Nevertheless, this research still has some drawbacks. The fixed-effects design cannot rule out that there are time-variant developments that affect both the amount of flexible labour and the wage in certain sectors, and therefore bias the results. Neither can the presence of these developments be tested. On top of that, this analysis merely focuses on the indirect effect of the two legal changes on the wage growth, via the possibility of becoming a flexible labourer. This partial analysis is unlikely to be biased, but a general analysis of the effect of the flexibilization of the labour market on wages which is also unbiased is preferable. Another drawback is the way the labour share is computed. Currently, the income of the self-employed is completely imputed to labour income. However, as Elsby et al. (2013) argue, it is better to impute part of it to capital income. As the amount of self-employed has increased, this research might actually have underestimated the decrease in the labour share.

Therefore, further research into the effects of flexibilization on the wages is needed. A lot of theoretical research has be done, and there is a need for the empirical testing of their conclusions. A research design that can both estimate the general effect of flexibilization and does not suffer many of the associated biases would be ideal. Another way to estimate the effect of flexibilization in a more general and unbiased way might be the use of microdata, preferably on the firm level. In short, this paper indicates that flexibilization has had a small but significant negative effect on the wage growth, via the increase in flexible labour. Further research should deepen our understanding of the mechanisms and details of the effect of flexibilization on the labour share.

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Appendix

Table A1
The effect of the liberalization of flexible labour on wage costs per hour

	Fixed-effects regression with decomposition			
	Binary treatment		**Proportional treatment**	
Wage costs/hour	WFZ	VAR	WFZ	VAR
Δ ln Productivity	0.164***	0.140***	0.189***	0.168***
	(0.0384)	(0.0380)	(0.0377)	(0.0383)
ln Inflation	0.871***	0.539***	0.914***	0.783***
	(0.158)	(0.179)	(0.154)	(0.166)
Treatment	-0.00200	-0.00615***	0.000731	-0.00411**
	(0.00221)	(0.00165)	(0.00259)	(0.00202)
Constant	0.00483**	0.00957***	0.00252	0.00637***
	(0.00214)	(0.00218)	(0.00217)	(0.00218)
Fixed Effects	Yes	Yes	Yes	Yes
Observations	312	312	306	306
R-squared	0.147	0.183	0.171	0.183
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A2
The effect of the liberalization of flexible labour on wages per hour

	Fixed-effects regression with decomposition			
	Binary treatment		**Proportional treatment**	
Wages/hour	WFZ	VAR	WFZ	VAR
Δ ln Productivity	0.172***	0.147***	0.181***	0.151***
	(0.0355)	(0.0373)	(0.0348)	(0.0384)
ln Inflation	0.766***	0.705***	0.713***	0.798***
	(0.146)	(0.176)	(0.142)	(0.167)
Treatment	0.0100***	-0.000597	0.0164***	0.00144
	(0.00204)	(0.00162)	(0.00239)	(0.00203)
Constant	-0.00375*	0.00396*	-0.00716***	0.00212
	(0.00197)	(0.00214)	(0.00200)	(0.00218)
Fixed Effects	Yes	Yes	Yes	Yes
Observations	312	312	306	306
R-squared	0.187	0.121	0.242	0.119
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A3

The effect of the liberalization of flexible labour on the labour share

	Fixed-effects regression with decomposition			
	Binary treatment		Proportional treatment	
Δ ln Labourshare	WFZ	VAR	WFZ	VAR
Δ ln Productivity	-1.088***	-1.128***	-1.019***	-1.105***
	(0.126)	(0.126)	(0.123)	(0.123)
ln Inflation	-0.566	-1.284**	-0.291	-1.020*
	(0.518)	(0.595)	(0.501)	(0.535)
Treatment	-0.00928	-0.0136**	-0.00871	-0.0221***
	(0.00723)	(0.00549)	(0.00841)	(0.00651)
Constant	0.0164**	0.0234***	0.0135*	0.0261***
	(0.00700)	(0.00724)	(0.00705)	(0.00700)
Fixed Effects	Yes	Yes	Yes	Yes
Observations	312	312	306	306
R-squared	0.206	0.217	0.194	0.223
Number of sectors	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour, the *VAR* of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A4

The effect of the liberalization of flexible labour by the WFZ, until 2001

	Fixed-effects regression with decomposition							
	Compensation		Wage costs		Wages		Labour share	
	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment
Δ ln Productivity	0.199**	0.255***	0.187*	0.247***	0.317***	0.357***	-0.595**	-0.217
	(0.0977)	(0.0912)	(0.0992)	(0.0920)	(0.118)	(0.125)	(0.230)	(0.160)
ln Inflation	-1.456***	-1.573***	-1.477***	-1.625***	0.573	0.243	-2.326**	-1.561**
	(0.453)	(0.407)	(0.459)	(0.411)	(0.546)	(0.560)	(1.067)	(0.712)
Treatment	0.00837**	0.0128***	0.00964***	0.0148***	0.0147***	0.0228***	0.00547	0.0150**
	(0.00356)	(0.00350)	(0.00361)	(0.00353)	(0.00430)	(0.00482)	(0.00839)	(0.00613)
Constant	0.0271***	0.0259***	0.0263***	0.0251***	-0.00403	-0.00460	0.0284**	0.0135*
	(0.00497)	(0.00455)	(0.00505)	(0.00459)	(0.00600)	(0.00626)	(0.0117)	(0.00797)
Observations	80	75	80	75	80	75	80	75
R-squared	0.238	0.379	0.238	0.392	0.299	0.391	0.136	0.126
Number of Sector	16	15	16	15	16	15	16	15

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of temporary labour. Estimated on the panel of 19 economic sectors and 7 years, from 1995 until 2001. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A5

The effect of the liberalization of flexible labour by the WFZ, until 2001

	Fixed-effects regression with decomposition			
	Compensation	Wage costs	Wages	Labourshare
Δ ln Productivity	0.258***	0.249***	0.361***	-0.213
	(0.0891)	(0.0894)	(0.123)	(0.160)
ln Inflation	-1.664***	-1.726***	0.143	-1.585**
	(0.401)	(0.402)	(0.554)	(0.718)
Treatment	0.0127***	0.0147***	0.0217***	0.0137**
	(0.00312)	(0.00313)	(0.00431)	(0.00559)
Constant	0.0262***	0.0254***	-0.00429	0.0135*
	(0.00445)	(0.00447)	(0.00615)	(0.00797)
Observations	75	75	75	75
R-squared	0.407	0.426	0.413	0.125
Number of Sector	15	15	15	15

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The outcome variable uses the percentage that is not temporary labour as a determinant, rather than all flexible labour. The *WFZ* was a major liberalization of temporary labour. Estimated on the panel of 19 economic sectors and 7 years, from 1995 until 2001. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A6

The effect of the liberalization of flexible labour by the VAR, after 1999

	Fixed-effects regression with decomposition							
	Compensation		**Wage costs**		**Wages**		**Labour share**	
	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment	Binary treatment	Proportional treatment
Δ ln Productivity	0.117***	0.152***	0.123***	0.159***	0.139***	0.142***	-1.181***	-1.144***
	(0.0393)	(0.0391)	(0.0396)	(0.0394)	(0.0298)	(0.0310)	(0.137)	(0.132)
ln Inflation	0.430**	0.714***	0.471**	0.751***	0.349**	0.499***	-1.332**	-1.148**
	(0.184)	(0.168)	(0.186)	(0.169)	(0.140)	(0.133)	(0.645)	(0.567)
Treatment	-0.00819***	-0.00612**	-0.00773***	-0.00553**	-0.00733***	-0.00840***	-0.0144**	-0.0264***
	(0.00196)	(0.00246)	(0.00198)	(0.00247)	(0.00149)	(0.00195)	(0.00686)	(0.00828)
Constant	0.0119***	0.00818***	0.0115***	0.00773***	0.0120***	0.0114***	0.0245***	0.0304***
	(0.00246)	(0.00251)	(0.00248)	(0.00253)	(0.00187)	(0.00199)	(0.00862)	(0.00845)
Observations	280	276	280	276	280	276	280	276
R-squared	0.193	0.188	0.191	0.189	0.265	0.250	0.224	0.234
Number of Sector	16	16	16	16	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The *VAR* was a major liberalization of sefl-employment. Estimated on the panel of 19 economic sectors and 19 years, from 1999 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A7

The effect of the liberalization of flexible labour by the VAR, after 1999

	Fixed-effects regression with decomposition			
	Compensation	Wage costs	Wages	Labourshare
Δ ln Productivity	0.167***	0.173***	0.159***	-1.169***
	(0.0382)	(0.0384)	(0.0309)	(0.131)
ln Inflation	0.736***	0.769***	0.538***	-0.885
	(0.165)	(0.166)	(0.133)	(0.563)
Treatment	7.95e-05***	7.47e-05***	9.27e-05***	0.000101
	(2.52e-05)	(2.53e-05)	(2.03e-05)	(8.60e-05)
Constant	0.00727***	0.00703***	0.00952***	0.0158**
	(0.00203)	(0.00204)	(0.00164)	(0.00694)
Observations	272	272	272	272
R-squared	0.214	0.216	0.264	0.242
Number of Sector	16	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables (inflation and productivity) are included. The outcome and decomposition variables are measured as their Δ ln. The outcome variable uses the percentage that is not self-employed (zzp) as a determinant, rather than all flexible labour. The *VAR* was a major liberalization of self-employment. Estimated on the panel of 19 economic sectors and 19 years, from 1995 until 2001. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A8

The effect of the liberalization of flexible labour by the WFZ, with lags

Treatment	**Binary**		
Lags	No lags	1	2
Δ ln Productivity	0.165***	0.156***	0.122***
	(0.0382)	(0.0381)	(0.0365)
ln Inflation	0.858***	0.838***	0.736***
	(0.157)	(0.157)	(0.149)
Treatment	-0.00327	0.00297	0.00302
	(0.00220)	(0.00355)	(0.00336)
1st lag		-0.00669**	0.00904**
		(0.00300)	(0.00389)
2nd lag			-0.0171***
			(0.00288)
3rd lag			
4th lag			
Constant	0.00574***	0.00599***	0.00722***
	(0.00213)	(0.00212)	(0.00201)
Fixed Effects	Yes	Yes	Yes
Observations	312	312	312
R-squared	0.152	0.167	0.257
AIC	-1992.711	-1995.969	-2029.691
Number of sectors	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome (compensation/hour) and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour. Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A9

The effect of the liberalization of flexible labour by the VAR, with lags

Treatment		**Binary**	
Lags	No lags	1	2
Δ ln Productivity	0.165***	0.156***	0.122***
	(0.0382)	(0.0381)	(0.0365)
ln Inflation	0.858***	0.838***	0.736***
	(0.157)	(0.157)	(0.149)
Treatment	-0.00327	0.00297	0.00302
	(0.00220)	(0.00355)	(0.00336)
1st lag		-0.00669**	0.00904**
		(0.00300)	(0.00389)
2nd lag			-0.0171***
			(0.00288)
3rd lag			
4th lag			
Constant	0.00574***	0.00599***	0.00722***
	(0.00213)	(0.00212)	(0.00201)
Fixed Effects	Yes	Yes	Yes
Observations	312	312	312
R-squared	0.196	0.208	0.208
AIC	-2008.984	-2012.03	-2010.038
Number of sectors	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome (compensation/hour) and decomposition variables are measured as their Δ ln. The *VAR* was a major liberalization of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A10

The effect of the liberalization of flexible labour by the WFZ, with lags

Treatment	**Proportional**		
Lags	No lags	1	2
Δ ln Productivity	0.188***	0.170***	0.0914**
	(0.0377)	(0.0376)	(0.0377)
ln Inflation	0.908***	0.880***	0.762***
	(0.154)	(0.152)	(0.143)
Treatment	-0.00132	0.00831**	0.00655
	(0.00258)	(0.00389)	(0.00416)
1st lag		-0.0108***	0.00797*
		(0.00330)	(0.00424)
2nd lag			-0.0207***
			(0.00317)
3rd lag			
4th lag			
Constant	0.00382*	0.00456**	0.00763***
	(0.00216)	(0.00214)	(0.00248)
Fixed Effects	Yes	Yes	Yes
Observations	306	305	289
R-squared	0.172	0.198	0.299
AIC	-1980.637	-1983.103	-1918.912
Number of sectors	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome (compensation/hour) and decomposition variables are measured as their Δ ln. The *WFZ* was a major liberalization of flexible labour. Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A11

The effect of the liberalization of flexible labour by the VAR, with lags

Treatment	**Proportional**		
Lags	No lags	1	2
Δ ln Productivity	0.165***	0.148***	0.120***
	(0.0380)	(0.0375)	(0.0388)
ln Inflation	0.729***	0.394**	0.265
	(0.165)	(0.181)	(0.183)
Treatment	-0.00550***	0.00614*	0.00543
	(0.00201)	(0.00355)	(0.00355)
1st lag		-0.0145***	-0.00740
		(0.00367)	(0.00455)
2nd lag			-0.00907***
			(0.00328)
3rd lag			
4th lag			
Constant	0.00752***	0.0114***	0.0138***
	(0.00216)	(0.00232)	(0.00246)
Fixed Effects	Yes	Yes	Yes
Observations	306	305	289
R-squared	0.193	0.231	0.249
AIC	-1988.244	-1995.903	-1898.965
Number of sectors	16	16	16

Notes. Fixed-effect regressions estimated with time and industry fixed effects; furthermore the decomposition variables are included. The outcome (compensation/hour) and decomposition variables are measured as their Δ ln. The *VAR* was a major liberalization of self-employment (*zzp*). Estimated on the full panel of 19 economic sectors and 22 years, from 1995 until 2017. Productivity information is however missing for several observations. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1