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# The Long-Term Effects of Being Hired Right After the Carnation Revolution

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Dissertation written under the supervision of Professor Pedro Miguel Santos Raposo

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**Abstract**

Title: The Long-Term Effects of Being Hired Right After the Carnation Revolution

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Keywords: Labour Market, Lifetime Wages, Carnation Revolution

Summary: Using the Carnation Revolution, this thesis tests if the impact of being hired in poor labour market conditions on lifetime wages is in fact negative, and how this effect differs for workers with a higher or a lower education level. For this, it uses Portuguese data from 1986 until 2017, using the worker's date of admission to control for selection. Controlling for individual characteristics and sector of activity, it estimates that workers hired right after the Revolution earned 3.6 percent more throughout their life than those hired two years before. Moreover, workers with a higher education level were not impacted as much as those with a lower education level. Overall, the results obtained do not support a negative impact of poor labour conditions at the time of hiring on lifetime wages. However, when only considering data until workers leave the firm, our estimates show that workers with a higher education exhibit a negative impact on wages.

**Resumo**

Título: Os Efeitos a Longo Prazo de Ser Contratado Logo Após a Revolução de 25 de abril

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Palavras-chave: Mercado de Trabalho, Salários ao Longo da Vida, Revolução de 25 de abril de 1974

Sumário: Utilizando a Revolução de 25 de abril, esta tese testa se o impacto de ser contratado em más condições do mercado de trabalho é de facto negativa, e como é que este efeito varia para trabalhadores com um maior ou menor nível de educação. Para isto, utiliza data de Portugal de 1986 a 2017, usando a data de admissão do trabalhador para seleção. Controlando para características individuais e setor de atividade, estima que os trabalhadores contratados logo após o 25 de abril tenham ganho 3.6 por cento mais ao longo da sua vida do que aqueles contratados dois anos antes. Para além disso, trabalhadores com um maior nível de educação não foram tão impactados como aqueles com um nível de educação mais baixo. No geral, os resultados obtidos não suportam um impacto negativo de pobres condições laborais no momento da contratação sobre os salários ao longo da vida. No entanto, quando apenas consideramos dados até os trabalhadores saírem da empresa, as nossas estimativas mostram que os trabalhadores com mais educação apresentam um impacto negativo nos salários.

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## 1. Introduction

Labour conditions at the time one starts a job can still have an influence on wages later on. There are a few empirical studies that have already studied the impact of entry labour conditions on wages throughout the course of the job (Beaudry & DiNardo, 1989) and even on lifetime wages (Brunner & Kuhn, 2014), finding a negative relationship between negative labour conditions and wages.

Taking advantage of the Carnation Revolution (25th April 1974) as a natural experiment, this thesis uses Portuguese data to test if the impact of being hired in poor labour conditions on lifetime wages is in fact negative. Furthermore, this analysis is also performed depending on workers' level of education. To evaluate this, the difference in lifetime wages between workers hired right after the Carnation Revolution and workers hired two years before will be compared, using the workers' data of admission to control for selection. For this, Portuguese data from 1986 until 2017 from *Quadros de Pessoal* was used, analysing wages and controlling for different sources of variation.

The 25th April 1974 represented for Portugal a massive political change: the dictatorship regime that had longed ruled in the country was overthrown and democracy was established. After the 25th April 1974 military coup, the country went through a period of high economic, social and political instability, with unexpected high wage rigidities. There was a decrease in the real GDP growth rate from an average of 8.57% between 1970 and 1973 to 2.91% in 1974 and -5.10% in 1975 (See Figure 1). The Provisional Government was a very unstable one with different members who had different solutions for the country, and with major clashes between left-wing and right-wing factions. It was only after the 25th November 1975 that the country was able to proceed with the consolidation of the democratic regime. During that interval Portugal had six Provisional Governments, right-wing coup attempts (such as the 28th September 1974 and 11th March 1975), a number of companies of basic sectors of the economy were nationalised, workers occupied both houses and seized control of companies, organising strikes and protests, demanding wage increases and other improvements of working conditions.

This was a period of uncertainty for both workers and firms, which was marked by several changes in the labour market. On one hand, firms did not know what would happen in the future. After the Revolution, they saw the Government adopting several measures that would harm them. Soon after the Revolution, it introduced a national minimum wage and prevented firms

from firing workers so easily as they did before. This means that a company who hired someone during this period could not be sure if it would be able to fire her or not, causing workers to be more reluctant about new hirings. On the other hand, workers realised they were now able to 'have a voice', demanding the improvement of working conditions, such as higher wages and the reduction of working hours.

Our estimate when controlling for employee characteristics and sector of activity is that workers hired right after the Carnation Revolution earned 3.62 percent more than those hired two years before. Overall, the results found do not support the theory that poor conditions at the time of hiring negatively impact lifetime wages.

The remainder of this thesis is structured in the following way: Section 2 provides a historical background of the Carnation Revolution. Section 3 presents some previous literature on the topic. Section 4 describes the data. Section 5 explains the methodology used. Section 6 contains the analysis and it is divided into four smaller sections: the first presenting an initial analysis, comparing wages of people hired right after the Carnation Revolution to workers hired two years before; the second providing a more thorough analysis, controlling for possible sources of wage variation; the third taking a deeper look focusing on which stage of career workers were when hired; and the fourth elaborating on the causes of the differences obtained. Section 7 presents some robustness tests. Section 8 contains the conclusions of the thesis.

## 2. Historical Background

On the 25th April 1974, a group of military officers, the Armed Forces Movement (hereafter, MFA), discontent with their career prospects and against the colonial war in Africa - which had started thirteen years before, in 1961, and had no end in sight - organised a military coup that overthrew the regime in order to obtain a political solution for the war problem without having to recur to violence. On the 26th, the President (of the Portuguese Republic) and the Government were dismissed, the Nacional Assembly and State Council were dissolved, and the *Junta de Salvação Nacional* was immediately created to exercise its powers, based on the MFA program. The president of the Junta, Spínola, became the President (of the Republic) and on the following day, on the 16th May 1974, the First Provisional Government took office. It was composed of representatives from different political forces, covering a large political spectrum - which would cause political unrest (Medeiros Ferreira, 1994) (Ramos et al., 2010).

On the 27th July 1974, the colonies were granted the right to self-determination and independence, which would lead to a movement of several people back to Portugal. However, the Portuguese political parties could not agree on how this should be conducted: some defended the recognition of pro-independence armed factions, others argued elections should be made, while others defended federalism. It is known that there were at least 505 078 returnees between 1974 and 1976, which represents 5.14 percent of the total population in 1981 (Medeiros Ferreira, 1994) (See Figure 2).

On the 11th March 1975 there was another coup attempt of the right-wing organised by Spínola. However, captains from both sides met in the streets, realised they had received different orders from the same authority and were treating each other as reactionaries, and decided not to fight but to clarify the situation with the authorities. This failed coup was the beginning of a new period known as Ongoing Revolutionary Process (*Processo Revolucionário em Curso* - hereafter, PREC). On that same night, the High Council of the MFA held an open meeting: institutionalising the MFA with the creation of the Revolutionary Council, voting in favour of nationalisations, and deciding to hold elections for the Constituent Assembly in April (Ramos et al., 2010). Thereafter, the Revolutionary Council started a wave of nationalisations, including banks, insurance, *"companies in basic sectors like petroleum, electricity, gas, tobacco, breweries, steelworks, cement, marine transport, shipbuilding and repair, trucking, and urban and suburban collective transport"* (Varela, 2019).

On the 11th April 1975 the main political parties signed a pact with the MFA, in which they promised not to demand readjustments in the Government composition after the elections, and which guaranteed that the MFA Assembly and the Revolutionary Council would remain in control in the following years and the latter would be acknowledged as a sovereign body in the Constitution. On the 25th April 1975, there were elections for the Constituent Assembly (whose purpose was to adopt the Constitution that was approved in April 1976), and the turnout was very high: 91.7 percent. From a choice of sixteen political parties, five of them received 88.9 percent of the votes, with the Socialist Party obtaining the majority of the votes (Ramos et al., 2010).

Despite this, the country was becoming more and more divided, making the conciliation between the political path and the revolutionary one even harder. The Summer of 1975, commonly referred to as the 'Hot Summer' of 1975, was characterised by several violent

disorders. The Socialist Party had formed an alliance with the Church, mostly against the Communist Party, and with the armed forces top hierarchy and the moderates in the MFA. At the same time, there were many demonstrations from the working class supporting the revolution. Workers organised strikes and the occupation of houses, land and workplaces continued. They seized control of the newspaper *República* - which was interpreted by the Socialist Party as an attempt of the Communist Party to control the communication media -, and the Catholic radio station *Rádio Renascença* - which together with the lack of action by the MFA led to the Church inciting violence. In fact, there were massive demonstrations encouraged by the Church, including the assault of headquarters of the Communist Party and of the revolutionary left, some of which were even burned down (Varela, 2019).

On the 10th July 1975, the Socialist Party formally withdrew from the Fourth Provisional Government, which collapsed six days later. In the beginning of August, one day before the Fifth Provisional Government was formed - which did not include neither the Socialist Party nor the conservative party PPD -, a document proposing an alternative (for the political crisis) to what had been proposed in the *Documento Guia* approved by the MFA and defending a MFA not influenced by political parties was published (Varela, 2019).

In September the Sixth Provisional Government took office, having to deal with a crisis in the MFA, duality of powers in the military, and strong social dissidence. On the 25th November 1975 a counter-revolutionary coup took place, with its civil direction headed up by the Socialist Party and the Church. The leader of the Communist Party agreed not to resist, and the military command troops that had been created by the MFA (the COPCON) surrendered. The Revolution had come to an end. This was a turning point for the country, which was now able to maintain the rule of law and the stability of institutions, proceeding with the consolidation of the democracy (Varela, 2019).

During this whole period numerous legislations directly related to labour were approved. Shortly after the revolution, on the 27th May 1974, the Government introduced a national minimum monthly salary of 3300$00 escudos (equivalent to 57.25 euros in 1986 prices), which was said that would benefit around 50 percent of the dependent employees and more than 68 percent of public employees (Decreto-Lei n.o 217/74, 1974), contributing to the rise of nominal wages (Medeiros Ferreira, 1994). In August 1974 it instituted a 13th paid month (Christmas subsidy) and a Holiday Pay of half the monthly pay (Decreto-Lei n.o 372/74, 1974) to the Civil

Service, later on extended to the Republican National Guard in November (Decreto-Lei n.o 615/74, 1974). In August 1974 it also introduced the right to strike (Decreto-Lei n.o 392/74, 1974). In June 1975 the minimum monthly salary of all dependent employees increased to 4000$ (Decreto-Lei n.o 292/75, 1975). In July 1975 the Government introduced new legislation on the termination of individual employment contracts, prohibiting firing an individual with no just cause or under unreasonable grounds (Decreto-Lei n.o 372-A/75, 1975).

In order to cover the effects for workers hired in this whole period of political instability, economic unrest and uncertainty about the future (between 25th April 1974 and 25th November 1975), the interval that will be considered for analysis is the one between May 1974 and December 1975.

## 3. Literature Review

(Carneiro et al., 2012) use Portuguese data from 1986 until 2007 showing not only that real wages fluctuate with Business Cycles, but also finding data that supports that entry wages are more procyclical than wages of existing workers within the same firm, accounting for worker, firm, and job title heterogeneity. They found that an increase in the unemployment rate of 1 percent decreased real hourly earnings by 1.87 percent for existing workers and by 2.47 percent for newly hired when considering worker fixed effects, and by 2.2 percent and 2.67 percent when considering both worker, firm, and job title fixed effects. But how do conditions at the time of hiring influence wages later on?

(Beaudry & DiNardo, 1989) studied the effect of unemployment at the time of hiring on workers' wages throughout the rest of the job in the United States. They found that poor labour market entry conditions, such as unemployment, can negatively influence wages throughout the course of the same job they were hired to, even when controlling for human capital and industry differentials. They estimated that an increase of 1 percent in the unemployment rate at the time of hiring implied a 2 to 2.6 percent decrease in wages over the course of that job.

More recently, (Brunner & Kuhn, 2014) found that unfavourable entry conditions had a negative effect on lifetime wages for low- and medium-skilled male individuals first entering the Austrian labour market between ages 16 and 21, estimating that an increase of 1 percent in the unemployment rate led to a decrease in lifetime wages of 1.3 percent. In addition, they

showed that as much as three quarters of this effect were explained by the lower quality of the employer.

Although the unemployment rate was not high right after the Carnation Revolution[1], the labour market conditions were far from ideal. As mentioned before, the political instability in the country was very high. In addition, the Government started implementing several laws that would benefit the workers but could harm the employers. One of the laws stated that employers could not fire an employee without having a just cause or under an unreasonable ground. This caused firms to be more reluctant about hiring workers and more cautious when doing so, since they could not simply fire a worker because they wanted to. This means that it was harder for people who were unemployed to find a job, even though the unemployment rate was not high.

Taking all of this into consideration, one would expect firms to have hired less right after the Carnation Revolution, and that people who were hired in this period, between May 1974 and December 1975, would earn lower wages throughout their lives when compared to workers hired two years before. However, (Brunner & Kuhn, 2014) also found that the lifetime loss in wages from entering on poor entry conditions for white-collar workers disappears within five to ten years, while for blue-collar workers these negative wage effects are persistent. Although they only considered people who were being hired for the first time, this means the effect of being hired right after the Carnation Revolution might have faded away for more educated workers and not be found in our analysis. If this is the case for our sample, it means that comparing wages for the general population might lead to a misleading result on how they were actually impacted. To take this into account, it was observed whether the differences between lifetime wages differed much when only considering workers with a higher education level or workers with a lower education level.

On a final note, there are several factors that need to be controlled for when evaluating the difference in wages. For example, it is expected that workers with a higher education level earn more than those with a lower one. According to human capital theory, higher investments in human capital, such as schooling, can increase earnings by increasing human capital itself

[1] Unemployment and Labour Force were extracted from Pordata, and the unemployment rate was calculated as: Unemployment over Labour Force. The value obtained for 1974 was 2.86% and for 1975 it was 3.51%.

(Becker, 1962). For this reason, our analysis will take into consideration whether workers had a high or a low education.

## 4. Data

### 4.1. Quadros de Pessoal

The database used is *Quadros de Pessoal*, a compulsory survey for all Portuguese public and private firms that have at least one employee, conducted annually by the Ministry of Labour and Social Solidarity. It provides longitudinal data on two levels: firms and workers, all of which have a unique identifier that enables their tracking over time and makes it possible to match the data from firms with employees.

The first year of the data that will be considered is 1986. Even though there is no data for employees in 1990 nor in 2001, it still covers a good time range and, by being conducted on an annual basis, allows a proper analysis over time. Nonetheless, it evidently has the drawback of not having data available since 1974, which would be relevant to analyse since the workers who were hired between May 1974 and December 1975 are the core of this analysis. This means that data between 1974 and 1986 is not being considered.

Since the survey is mandatory, it should cover almost every firm, providing a good coverage of the Portuguese labour market. Concerning worker level data, it contains information on workers' characteristics (such as date of birth, gender, nationality) and it provides detailed information on wages and information on workers' date of admission, which is crucial to the analysis that will be performed.

### 4.2. Sample Selection and Variable Creation

The observation interval considered was from 1986 to 2017. From this database, the analysis was restricted to Portuguese employees (employers, unpaid family workers, active members of Producers Cooperative and others whose information about this aspect was ignored were excluded) with a full base wage, who worked at least 120 hours (not counting overtime hours) for not more than 50 years in the same firm. Workers from agriculture, farming of animals, hunting and forestry were also excluded from this analysis. In addition to this, duplicate entries - when there existed more than one observation per year for each person - were removed.

As mentioned before, the population that will be analysed are the workers who were hired to firms right after the Revolution (between May 1974 and December 1975). Despite not having data available for this period, it is possible to know which workers in the database were hired

at the time. This can be done by using the variable Date of Admission available in *Quadros de Pessoal*, which provides the month and the year when the worker was hired to the firm. To correct for possible reporting errors in the date of admission, a new variable was created: For each combination of worker and firm, the most frequent value for the date of admission was observed and assumed to be the correct one. When a mode did not exist, the true value was assumed to be the oldest date of admission reported for this worker-firm combination. However, to account for the fact that a worker might have left a firm and later return to work for it again, this new variable was replaced by the minimum reported date of admission for each pair of worker and firm when the new year of admission was higher than the year of the observation. The logic behind this is that if there were more observations with the most recent date, it would wrongly assume that same date for older observations. If the contrary happens, it does not pose a problem for this analysis. After this, all observations which had an admission year higher than the observation year were deleted.

To take into consideration the working legal age (Decreto-Lei n.o 49408, 1969) only workers who were hired with at least 14 years of age were considered. In addition, observations in which workers were more than 60 years old were dropped, observations with no information on education were also dropped, and workers whose gender was not accurately identified were also excluded.

Using the above-mentioned date of admission, all people who were never hired between May 1972 and December 1973 or between May 1974 and December 1975, - which are the two groups of people whose wages are going to be compared -, were removed from the sample. The final data set includes 1,989,539 observations, 252,403 individuals, and 96,496 firms (See descriptive statistics in Table 3).

The dependent variable in this analysis will be the logarithm of real total wage paid every month to employees. A worker's total wage was defined as the sum of all components that the wage includes, namely: nominal wage base, seniority payment, regular benefits, irregular benefits and overtime payment. Real wages were computed using Consumer Price Index (CPI)[2], taking 1986 as the base year.

$$(1)\ Total\ Wage = Wage\ Base + Seniority\ Payment + Regular\ Benefits + Irregular\ Benefits + Overtime\ Payment$$

[2] https://bpstat.bportugal.pt/serie/5721550

Índice de preços no consumidor - Portugal - Mensal - Taxa de variação da média móvel de 12 meses

Since wages vary considerably throughout a worker's career - an older more experienced worker is expected to earn more than a younger less experienced worker -, it is important to take this into account to prevent obtaining differences in wages that come from the sample's composition. For this, wages will be observed according to workers' age when being analysed to compare for all age groups. To do this, a new variable was created according to one's age when evaluated, breaking up ages into four groups: less than 30 years; between 31 and 40 years; between 41 and 50 years; and between 51 and 60 years. In addition, wages will also be analysed according to workers' age in 1974 to take into account in which stage of their career workers were when hired. For this, three additional variables were created according to workers' birth year. The first variable computed was workers' age in 1974, which in turn was used to create a new variable: a birth year cohort (See Table 4). The other was a binary variable (*early*), to be included in the econometric analysis, to simply account for whether a worker was in an early stage of his career when hired (birth year between 1945 and 1961) or not (birth year between 1926 and 1944), making use of the previously created variable.

Regarding workers' education, *Quadros de Pessoal* provides the highest educational level completed by the worker. For the purpose of the analysis, an additional variable (*loweduc*) was created to consider if the level of education was higher than the compulsory schooling at the time - 2º *ciclo* - primary education (Decreto-Lei n.o 45810, 1964) - or not, considering the oldest observation for each individual in the sample (which is assumed to be the same than the one at the time of hiring).

Additionally, it is important to notice that, since data used is from 1986 until 2017, people who were above 48 years old in 1974 are not being evaluated (See Table 5).

## 5. Methodology

To study the impact of poor labour market conditions at the time of hiring on wages, the Carnation Revolution will be used as a sort of natural experiment. People who were hired right after the Carnation Revolution were hired in a period of economic, political and social instability. However, those hired two years before were not hired under these circumstances. In addition, workers did not choose to belong to a group or the other knowing the differences of being hired in one period or the other. This means that without expecting so, some people were affected by being hired in the unstable period right after the Carnation Revolution, while others were not.

Apart from this, workers who were hired right before the 25th April 1974 and workers who were hired right after it do not have any reason to have significant structural differences between them, such as age, sex and education. In fact, looking at Table 3, it can be confirmed that in our sample they have similar characteristics.

Taking into account whether a worker was ever hired during these periods, we will analyse wages throughout the rest of their life. As mentioned before, both workers and firms have a unique identifier in *Quadros de Pessoal*, which allows us to follow the same person and the same firm over time.

To identify workers who were hired right after the Carnation Revolution (between May 1974 and December 1975) and workers who were hired two years before (between May 1972 and December 1973), three binary variables were created using the date of admission. Since we wanted to consider lifetime wages, all observations belonging to workers who were ever hired then were assigned the same value. After this, all observations corresponding to workers who were not hired in neither of the periods were deleted and a new binary variable was created, indicating whether the worker belonged to the group of people who were ever hired right after the 25th April 1974 or to the comparison group. In the event an individual was hired in both periods at some point in time he was considered as part of the group hired during the Carnation Revolution (and not the comparison group), since he is part of the group that is the focus of the analysis and not serving for control purposes. Furthermore, observations for which the date of admission was older than the date correspondent to the *treatment* period were removed, since they must correspond to reporting errors.

Using panel data, OLS estimations were made to understand how wages varied according to the period in which workers were hired. In addition to this, OLS estimations were also done depending on workers' education level to understand how this difference in lifetime wages varied according to whether workers had an education level higher than primary education [high] or equal to or lower than primary education [low]. Then, estimates were observed, focusing on the coefficient of *treatment*, which corresponds to the percentage difference between average wages of those hired right after the Carnation Revolution and those hired two years before.

Before the econometric analysis itself, the average logarithm of total real wages of the workers hired right after the 25th April 1974 between 1986 and 2017 was compared to that of those hired two years before. Secondly, the same difference was observed accounting for whether their education level was higher than primary education or not at their earliest observation available, using Equation (2) and looking at its coefficients:

$$(2)\ \log t\ real\ wage = \beta_0 + \beta_1\ treatment + \ \varepsilon_{it}$$

where *log t real wage* is the logarithm of total real wages, *treatment* is a binary variable equal to 1 if the worker was ever hired between May 1974 and December 1975 and equal to 0 if not.

Subsequently, more variables were introduced into the equation to control for other factors that affect wages, namely tenure, age, sex, stage of career when hired, sector of activity and education level. To control for wages differences that were inherent to the year in question year dummies were also introduced (See Equation (3)). Again, the coefficient of *treatment* term was analysed to observe differences in wages.

$$(3)\ log\ t\ real\ wage_{it} = \beta_0 + \beta_1\ treatment_i + \beta_2\ tenure_{it} + \beta_3\ tenure_{it}^2 + \beta_4\ age_{it} + \beta_5\ age_{it}^2 + \beta_6\ male_i + \beta_7 early_i + \beta_8\ sector\ of\ activity_{it} + \ \beta_9\ loweduc_i\ + \alpha\ D_t + \ \varepsilon_{it}$$

where *tenure* is the number of full years worked in the same firm, *male* is a binary variable equal to 1 if the worker is male and equal to 0 if not, *early* is a binary variable equal to 1 if the worker was born between 1945 and 1961 (which means he was hired in an early stage of his career) and 0 if not, *loweduc* is a binary variable equal to 1 if the worker has an education level equal to or lower than primary education and equal to 0 if higher, and D corresponds to the year dummies[3]. Subscript *i* refers to the individuals and subscript *t* refers to the year.

Afterwards, the same analysis was made, depending on whether the education level at the time of hiring was equal to or lower than primary education or above it, using Equation (4).

[3] $\alpha\ D_t$ is equal to $\alpha_1 d1987_t\ +\ \alpha_2 d1988_t\ +\alpha_3 d1989_t\ +\alpha_4 d1991_t\ +\alpha_5 d1992_t\ +\ \alpha_6 d1993_t + \ldots + \alpha_{12} d1999_t\ +\alpha_{13} d2000_t\ +\alpha_{14} d2002_t\ +\alpha_{15} d2003_t + \ldots + \alpha_{28} d2016_t\ +\alpha_{29} d2017_t$

$$(4)\ log\ t\ real\ wage_{it} = \beta_0 + \beta_1\ treatment_i + \beta_2\ tenure_{it} + \beta_3\ tenure_{it}^2 + \beta_4\ age_{it} + \beta_5\ age_{it}^2 + \beta_6\ male_i + \beta_7 early_i + \beta_8\ sector\ of\ activity_{it} + \alpha\ D_t + \varepsilon_{it}$$

## 6. Analysis

### 6.1. Preliminary Analysis

As a starting point, average log real wages across time for people who were hired right after the Carnation Revolution (between May 1974 and December 1975) versus people hired two years before were observed. With this simple comparison, it is seen that workers who were hired after the Carnation Revolution exhibit higher wages in every year compared to the ones hired in the homologous period, on average (See Figure 3). Nevertheless, it is important to notice that data for some years of these workers' life is missing since the first year observed (1986) is between eleven and fourteen years later than the time of hiring (1972-1975).

Even though samples have a similar composition in terms of workers' age (See Table 3) it was also seen whether there was a difference in lifetime wages between those hired in that period of uncertainty and those hired two years before when only comparing the same age group (See Figure 4). It was seen that the difference in lifetime wages between these two is not so significant across the years for every age group. For workers who were between 25 and 30 years old at the time of analysis - who were between 14 and 18 years old in 1974 - the difference seems to be close to zero. For those older than 40 years old at the time of analysis, this wage difference is close to zero in the first years of the analysis and later higher than zero, with those hired between May 1974 and December 1975 earning more than those hired two years before them. The only group for which this difference is higher than zero in every year is the group of workers who are between 31 and 40 years old at the time of analysis, with those hired right after the Carnation Revolution earning more than those hired two years before. However, this group only includes people who were between 14 and 28 years old in 1974. Although this age group does not include all workers who were between 14 and 28 years old in 1974, this seems to indicate that young workers who were hired right after the Carnation Revolution earned more than young workers who were hired two years before.

In fact, one important factor that needs to be taken into account is in which stage of their career workers were when hired. For this, workers' birth year was used, considering their age in 1974. Before analysing the graphics obtained, one needs to bear in mind their age at the time of the

analysis (See Table 4). Observing the average log real wage across time by birth year cohort (See Figure 5), it can clearly be seen that: except for those who were born between 1935 and 1944, those who were hired between May 1974 and December 1975 earned more throughout their life than those who were hired between May 1972 and December 1973. In this analysis, workers who were born between 1945 and 1961 were between 14 and 29 years old in 1974 and workers who were born between 1926 and 1944 were between 30 and 48 years old in 1974. This means that workers who were young when hired between May 1974 and December 1975 earned more throughout their lives compared to those who were hired two years before with the same age. With respect to workers who were older when hired right after the 25$^{th}$ April, only those born between 1935 and 1944 do not show significant differences in lifetime wages when compared to those hired two years before (See Figure 5). As it can be seen, it is relevant to consider in which stage of their career workers were at when hired.

The focus of this analysis lies on the differences of being hired right after the Carnation Revolution (between May 1974 and December 1975) or being hired two years before. In our sample, it can be seen that those hired right after the Carnation Revolution earned 8.13 percent more than those hired two years before during the rest of their life. Furthermore, it is also of interest to understand how this difference changes according to the education level. Looking at people's wages across time according to their education (See Figure 6), it is clear that workers with a lower education level [low] who were hired right after the Carnation Revolution earned more throughout their lives than those who entered two years before - with workers hired between May 1974 and December 1975 earning 9.06 percent more than workers hired between May 1972 and December 1973 (See Table 6). In addition, regarding workers with a higher education [high] those hired right after the Carnation Revolution earned less (than those hired two years before) from 1986 until 2000 and more from then onwards. Looking to the overall data, it is seen that these workers with a higher education [high] who were hired between May 1974 and December 1975 earned 0.24 percent more than those who were hired two years before (See Table 6).

Summing up, there is a difference in lifetime wages between workers who were hired in that period of uncertainty and those who were hired two years before, with those hired right after the Carnation Revolution earning higher wages during their lifetime. Nevertheless, this could have happened for a number of reasons other than from having been hired during this period.

Other factors such as individual characteristics (e.g. age, sex) and sector of activity can influence wages. To understand this, an econometric analysis will be performed.

### 6.2. Econometric Analysis

This section presents the results obtained from the OLS estimations using equations (3) and (4). It can be seen that, when controlling for other factors (such as age, tenure, sex, stage of career when hired, sector of activity and education level), workers who were hired right after the Carnation Revolution actually earned 3.62 percent more than those who were hired two years before did (See Table 1).

**Table 1**: Estimates of Effects on the Log Total Real Wage

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| treatment | 0.0362** |
| | (0.0006) |
| $R^2$ | 0.5129 |
| Number of observations | 1 989 539 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early*, sector of activity and *loweduc*; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

Doing the same analysis but only comparing workers who were hired in one period to those hired in another period with the same education level, using equation (4), it can be seen that: when controlling for other factors, workers with a higher education [high] who were hired right after the Carnation Revolution earned 1.1 percent more than those with a higher education [high] who were hired two years before did. On the other hand, workers with a lower education [low] who were hired between May 1974 and December 1975 earned 4.52 percent more than those with a lower education who were hired two years before, even when other factors are taken into account (See Table 2).

**Table 2**: Estimates of Effects on the Log Total Real Wage

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| **High** | |
| treatment | 0.011** |

| | |
|---|---|
| | (0.0016) |
| $R^2$ | 0.3407 |
| Number of observations | 427 835 |
| **Low** | |
| treatment | 0.0452** |
| | (0.0007) |
| $R^2$ | 0.4323 |
| Number of observations | 1 561 704 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early* and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

This shows that, even when accounting for individual characteristics and sector of activity, workers who were hired right after the Carnation Revolution did earn more during their lifetime than those hired two years before. In addition, although both results are statistically significant, the results obtained for workers with a lower education [low] are more economically significant than for workers with a higher education [high], in the sense that the difference obtained when comparing to the same education level is higher for those with a lower education.

Overall, the results obtained for both workers with a lower education and workers with a higher education hired right after the Carnation Revolution are not consistent with the theory that being hired in a period characterised by poor conditions negatively influences lifetime wages.

### 6.3. A Deeper Look According to Stage of Career

As mentioned before, it is important to take into account that wages vary considerably throughout a worker's career. In the previous section this was taken into account by considering the worker's stage of career a control variable that influences wages. Now, it will be seen how the estimates differ when distinguishing workers in an early stage of career from those in a later stage of career.

Using equation (3), controlling for the same factors as before, to observe the difference between wages for workers hired from May 1974 until December 1975 and workers hired two years before, but also distinguishing in which stage of their career workers where when hired, there was still a significant difference observed: for workers who were hired in an earlier stage of their career, those hired right after the Carnation Revolution earned 4.04 percent more than

those hired two years before; and for those who were not, those hired right after the Revolution earned 3.14 percent more because of it (See Table 7).

Once again distinguishing between workers with a higher education or a lower one, the results obtained for those with a higher level of education [high] now depend on which stage of their career they were when hired: when comparing young workers, those hired right after the Revolution earned 2.33 percent more, while those in a later stage of their career earned 4.52 percent less than workers hired two years before. On the other hand, workers with a lower education level [low] who were hired between May 1975 and December 1975 earned more than those hired two years before, regardless of the stage of their career when hired: those who were in an early stage of their career earned 4.71 percent more throughout their life and those who were not earned 4.21 percent more than those hired two years before (See Table 8).

### 6.4. Understanding the Differences Obtained

As it was seen in section 6.2., a great part of the differences in wages that are observed between the two groups are due to individual characteristics and sector of activity, since the difference in lifetime wages of 8.13 percent was reduced to 3.62 percent when controlling for these factors. Nevertheless, even when controlling for multiple factors there are still relevant differences in wages, especially for workers with a lower education level. What is the reason that caused workers who were hired right after the Carnation Revolution to earn more during their lifetime?

It is known that there were at least 505 078 returnees between 1974 and 1976, which represents 5.14 percent of the total population in 1981 (Medeiros Ferreira, 1994). Did workers earn more throughout their lifetime because the composition of the labour supply changed with this return of Portuguese people from the colonies, somehow increasing wages? Was it because firms in general were hiring more and thus offered higher wages to attract workers? None of this seems to be the case because if it were for any of this, even if wages had increased in that period, they would probably not have remained higher when workers moved to a different firm and definitely not so many years after the Revolution.

Using the sample used for the analysis, it can be seen whether the difference in the number of people hired right after the Revolution differs much from the number of people hired two years before. This is not a very precise measure since the data used is from the people who were actually hired and were still working in 1986, but it should be a close one, especially since this is the data with which wages are being analysed. It can be seen that the number of workers

hired was much lower right after the Revolution when compared to two years before, being more noticeable for those hired between April and December 1975 - when the number of people hired was more than 50 percent lower than it had been two years before. This means that there was not an increase in labour demand, since an increase would only lead to less hirings if the labour supply had decreased. Additionally, it can be seen that the difference of the number of people hired right after the Revolution compared to the number of two years before was proportionally similar for those a lower education [low] and for those with a higher education [high] (See Table 9).

Two other reasonable possibilities that could still explain the higher wages so many years after the Revolution are: that firms who were hiring then were better and simply offered higher wages; or that maybe, since firms were not sure whether or when they could fire workers and the future was so uncertain, the ones who were hired then were only the best?

The plausible explanation is that this effect must come from permanent unmeasured differences. To do this, the AKM wage model that was proposed to analyse individual- and firm-level heterogeneity in compensation determination (Abowd et al., 1999) will be considered. Regarding employee heterogeneity, observable characteristics have already been controlled for and it is not possible to control for unobservable ones since we would be removing the effect we want to analyse: the date when the employee was hired. Regarding firms, we will control for both observable and unobservable firm heterogeneity[4]. It is assumed that these unobserved characteristics do not change over time, and we cannot incur into an omitted variable bias in time invariant variables. Table 10 presents the results obtained, calculated according to equations (3) and (4).

Controlling for firm heterogeneity, wage difference between workers hired right after the Carnation Revolution and those hired two years before is now significantly lower: the difference obtained is now 0.36 percent. If we look closer, it can be seen that for those with a higher education [high] this difference remains almost the same as obtained before, which means that, although some differences exist and affect wages, there are no significant observable nor non-observable differences in wages that are inherent to firms. For those with a

[4] Fixed effects were partial out using a Stata package that implements the high-dimensional fixed effects estimator described in (Correia, 2017).

lower education [low] this difference is now much lower than the one obtained in our previous analysis, being close to zero: it is now obtained that workers hired between May 1974 and December 1975 earned 0.23 percent less than those hired two years before. This means there are differences inherent to firms who hired during these periods that affect wages of lower educated people.

With this analysis, it can be seen that that the wage differences previously obtained in section 6.2 for workers with a lower education [low] who were hired right after the Carnation Revolution were caused by different firm characteristics, which means that the firms that were hiring right after the Carnation Revolution were probably only the best ones. Regarding workers with a higher education [high] there is still a small difference in wages that remains unexplained.

## 7. Robustness

To correctly evaluate the values obtained, the model will be re-estimated only considering observations until workers stop working for the firm to which they were hired, and comparing wages from the control group to a similar group to see if results obtained are robust to the periods that are being considered. Additionally, the model will also be re-estimated distinguishing between workers hired before the 11$^{th}$ March 1975 and workers hired after it.

### 7.1. Analysis Until Workers Change Firm

First, it will be seen whether the results differ from the previously obtained when evaluating workers' wages until they start working for a company different than the one they were hired to, instead of considering all wages from then onwards. Compared to the original sample, the number of individuals is the same, while the number of observations is lower and the average number of years a person remains in the same firm is now higher (See descriptive statistics in Table 11).

The results obtained indicate that, controlling for individual characteristics and sector of activity, workers hired right after the Carnation Revolution earned 3.04 percent more throughout their lifetime than those hired two years before (See Table 12). Separating the sample into two groups according to their education, the results are that: workers with a lower education [low] hired in this period of uncertainty earned 4.43 percent more than those hired

two years before, while those with a higher education [high] earned 1.39 percent less (See Table 13). This means that it is still obtained that workers with a lower education [low] were positively impacted by being hired right after the Carnation Revolution (although slightly less than seen before), but it is now obtained that those with a higher education [high] were actually slightly harmed from being hired right after the Revolution (See Table 13). In sum, the results obtained are consistent with the approach taken for workers with a lower education but are not consistent for workers with a higher education.

Since the time frame that is now being analysed does not capture observations that are further away from the significant event (the period of uncertainty), the intuition would be to observe bigger effects than before, which does not happen. However, there may be a different explanation. (Correia, 2017) analysed the Austrian labour market between 1978 and 2000 for male people being hired for the first time to understand the impact of entry conditions and observed that: poor entry conditions negatively affect lifetime wages and "*wage effects are much more persistent for blue-collar workers because some of them appear to be permanently locked in into low-paying jobs/tasks*". In our case, a negative impact was only found now when analysing wages until workers change firm for those with a higher education [high]. Nevertheless, according to this and knowing that typically white-collar workers have a higher education than blue-collar workers, whose is usually low, it is possible that the negative effect that was now obtained for those with a higher education [high] might have faded away when later observations were considered.

### 7.2. Falsification Test

The results obtained might have been influenced by using that specific time interval - between May 1972 and December 1973 - as the date of hiring of the comparison group. To address this, the control group used will be compared to a different time interval: comparing lifetime wages of workers hired between May 1970 and December 1971 with those of workers hired between May 1972 and December 1973, while controlling for the same factors as before (See descriptive statistics in Table 14).

There should be no relevant difference in wages between these workers. If there is, the magnitude of the impact of being hired right after the Carnation Revolution might have been under-/over-estimated.

Workers who were hired between May 1970 and December 1971 earned 0.33 percent less throughout their lifetime than those hired two years before (See Table 15). Furthermore, workers with a higher education [high] who were hired during this period were negatively impacted by being hired then, earning 1.09 percent less than those [high] who were hired two years after. Regarding workers with a lower education [low], the results obtained also show a small difference between the two groups, with workers hired between May 1970 and December 1971 earning 0.46 percent less than the ones hired between May 1972 and December 1973 (See Table 16).

All in all, although the magnitude of the impact of being hired right after the 25th April 1974 might have been slightly underestimated, the results previously obtained remain valid.

### 7.3. Distinguishing Those Hired Before the 11th March 1975 from Those Hired After It

As discussed above, the analysis focused on the workers who were hired right after the Carnation Revolution, between May 1974 and December 1975. However, this interval comprises very different periods. The most relevant difference for our analysis is that after the 11th March 1975 the country entered into a period even more marked by political instability, a wave of nationalisations, violent strikes, protests, occupations, and a constant threat of political-military coups. To see if the results differ when considering workers hired in the time interval until or after this date, the hiring period between May 1974 and December 1975 will be separated in two. To do this, the hiring periods that will be considered are between May 1974 and March 1975, and between April 1975 and December 1975. The model used will be re-estimated comparing workers hired during these two periods to those hired two years before (See descriptive statistics in Table 17).

Looking at people's wages across time (See Figure 7), it is clear that workers who were hired right after the Carnation Revolution earned more throughout their lives than those who entered two years before, regardless of which of the two periods after the Carnation Revolution they were hired in. However, when doing this analysis according to their education level (See Figure 8), the same can only be concluded for workers with a lower education [low] who entered right after the Carnation Revolution. In fact, workers with a lower education [low] who were hired between May 1974 and March 1975 earned 7.35 percent more (than workers hired between May 1972 and March 1973), and workers [low] hired between April 1975 and December 1975 earned 12.12 percent more (than workers hired between April 1973 and December 1973) (See

Table 18). Looking at wages across time for workers who were hired with a higher education [high], the difference between those hired right after the Carnation Revolution and those hired two years before is not so clear (See Figure 8). Workers hired between May 1974 and March 1975 earned 0.67 percent less than those hired two years before, and those hired between April 1975 and December 1975 earned 0.68 percent more than those hired two years before (See Table 18).

Using equation (4) it can be seen that, even when controlling for other factors, there are differences between lifetime wages of workers with a lower education [low] who were hired right after the Carnation Revolution and those hired two years before: with those hired between May 1974 and March 1975 earning 3.82 percent more and those hired between April 1975 and December 1975 earning 6.28 percent more. Regarding workers with a higher education [high] who were hired right after the Carnation Revolution: those who were hired between May 1974 and March 1975 earned 1.07 percent more than those hired two years before; and those who were hired between April 1975 and December 1975 earned 1.37 percent more than those hired two years before (See Table 20). As it was previously seen, workers with a lower education were more significantly impacted from being hired right after the Carnation Revolution than those with a higher education.

Concerning the difference from being hired between May 1974 and March 1975 or between April 1975 and December 1975 rather than two years before, it can be seen that the magnitude of the effect was different: those who were hired in the first half of the period (between May and March) have smaller differences in wages compared to the control group than those hired in the second half (between April and December 1975) do. Nevertheless, the results are consistent with the previously obtained results, and therefore not consistent with the theory that being hired in a period characterised by poor conditions negatively influences lifetime wages.

## 8. Conclusion

In this research Portuguese wages between 1986 and 2017 were analysed with the purpose of understanding whether the conditions in this period of political, social and economic instability right after the Carnation Revolution affected wages of people hired during that period and how it did so depending on their level of education.

Firstly, it was seen that workers with a lower education [low] who were hired right after the Revolution earned more throughout their lifetime than those hired two years before - earning 9.06 percent more -, and that for workers with a higher education [high] it varied depending on whether they were hired before or after the 11th March 1975: with the ones who were hired in the first part of the period earning 0.67 percent less than those hired two years before and those hired in the second part of the period earning 0.68 percent more than those hired two years before.

Secondly, even when controlling for individual characteristics that influence wages and sector of activity, workers with a lower education level [low] still showed relevant differences in wages. Nevertheless, the result obtained when controlling for these factors is now much lower than the difference in wages. According to our estimates, those [low] who were hired between May 1974 and December 1975 earned 4.52 percent more than those hired two years before. This suggests that these workers must have a higher productivity level and thus be paid more. Otherwise, their wages would not be so high so many years after the Carnation Revolution. Since there was still a relevant difference in wages, even when controlling for multiple factors, it must come from permanent unmeasured differences. To understand this, a fixed effects model was used, controlling for both observed and unobserved firm heterogeneity. The results obtained were that this difference almost disappeared for [low] workers. This suggests that the firms that were hiring right after the Carnation Revolution must have been only the best firms and thus be paying higher wages, on average, when compared to all firms that were hiring two years before.

For workers with a higher education [high] our results still show a difference in lifetime wages, even when controlling for other factors, with an estimate of 1.07 percent in lifetime wages for those who were hired between May 1974 and March 1975, and an estimate of 1.37 percent for those hired between April and December 1975. However, when only considering wages until workers change firm while analysing workers with a higher education hired between May 1974 and December 1975, the impact obtained was a negative one - it was estimated that they earned less than workers hired two years before them. One possibility is that those with a higher education [high] were actually negatively impacted by being hired right after the Carnation Revolution, but the effect might have faded away when later observations were considered.

Overall, our results indicate that uncertainty about the future and the impossibility of firing workers in the near future caused firms to behave differently. However, our results do not support the theory that poor conditions at the time of hiring negatively impact lifetime wages. It seems that when hiring workers with a lower level of education only the best ones were hired. In addition, regarding workers with a lower education, firm fixed effects also seem to have had a significant impact on wages throughout their whole life. One possible explanation for this is that only firms who were better off were hiring these workers at the time, thus offering higher wages, and workers remained in those firms. On the other hand, workers with a higher education level were not affected as much as those with a lower education level.

An interesting aspect that was found is that workers who were hired between April and December showed bigger differences in wages in our estimates than those hired between May and March. Since both instability and uncertainty were higher in the second part of the period analysed, when some even feared could turn into a civil war, this indicates that, at least for the workers with a lower education, the higher the level of uncertainty the higher the effect on lifetime wages.

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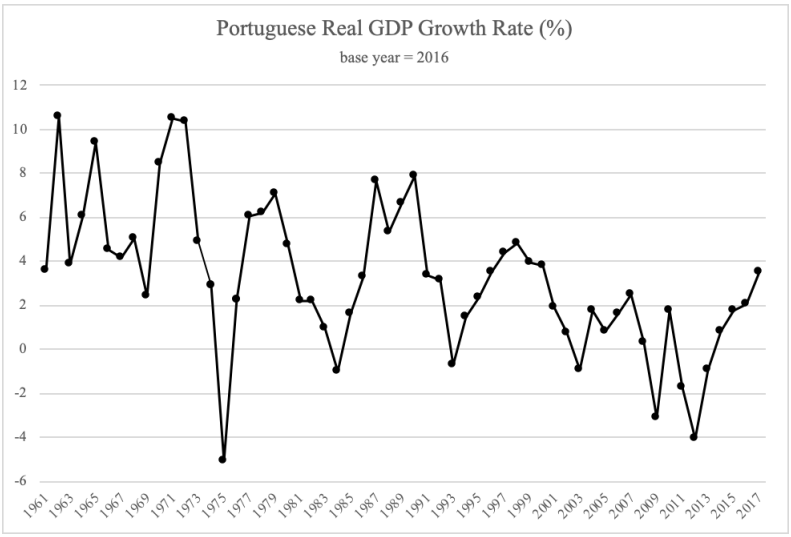
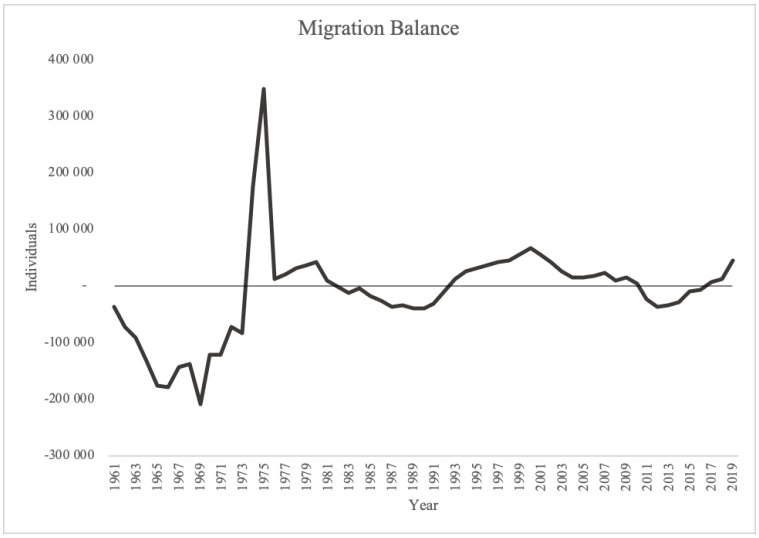
## 10. Appendix

**Figure 1**: Portuguese Real GDP Growth Rate




Source: Pordata

**Figure 2**: Migration Balance




Source: Pordata

**Table 3**: Descriptive Statistics

| | Hired between May 1974 and December 1975 | Hired between May 1972 and December 1973 |
|---|---|---|
| Observations | 769 788 | 1 219 751 |
| Individuals | 97 397 | 155 006 |
| Firms | 42 515 | 53 981 |
| | | |
| Male (% individuals) | 67.6 | 62.19 |
| Age | 45.46 | 45.32 |
| | (8.3173) | (8.2411) |
| Min, Max age | 25, 60 | 27, 60 |
| Min, Max birth year | 1926, 1961 | 1926, 1959 |
| Mean total real wage | 446.58 | 410.06 |
| | (548.8617) | (431.563) |
| Mean log t real wage | 5.878909 | 5.797604 |
| | (0.6256) | (0.6121) |
| Mean tenure (in years) | 16.65 | 17.77 |
| | (9.1739) | (9.4486) |
| | | |
| Birth year cohort (% observations) | | |
| [1926,1934] | 2.5 | 2.47 |
| ]1934,1944] | 13.48 | 13.46 |
| ]1944,1954] | 49.49 | 45.74 |
| ]1954,1961] | 34.54 | 38.32 |
| | | |
| Age cohort (% observations) | | |
| 25<=age<=30 | 4.71 | 4.42 |
| 31<=age<=40 | 24.28 | 25.61 |
| 41<=age<=50 | 39.68 | 39.45 |
| 51<=age<=60 | 31.33 | 30.51 |
| | | |
| Education level (% observations) | | |
| Low | 77.6 | 79.1 |
| High | 22.4 | 20.9 |

Notes: Standard deviations in parentheses;

High - higher than primary education; Low - primary education or less.

**Table 4**: Birth Year

| Birth Year | Age in 1974 | Age in 1986 | Age in 2017 |
|---|---|---|---|
| [1926, 1934] | 40 - 48 | 52 - 60 | 83* - 91* |
| [1935, 1944] | 30 - 39 | 42- 51 | 73* - 82* |
| [1945, 1954] | 20 - 29 | 32 - 41 | 63* - 72* |
| [1955, 1961] | 13* - 19 | 25 - 31 | 56 - 62* |

* Sample selection: no more than 60 years old and hired with 14 years or more.

**Table 5**: Age Across the Years for Workers with the Oldest and Most Recent Birth Years

| | Birth Year | Age in 1974 | Age in 1986 | Age in 2017 |
|---|---|---|---|---|
| Most recent birth year | 1961 | 13 | 25 | 56 |
| Oldest birth year | 1926 | 48 | 60 | 91* |

* Sample selection: no more than 60 years old and hired with 14 years or more.

**Figure 3**: Log Real Wage of People Hired Between May 1974 and December 1975 versus Those Hired Two Years Before

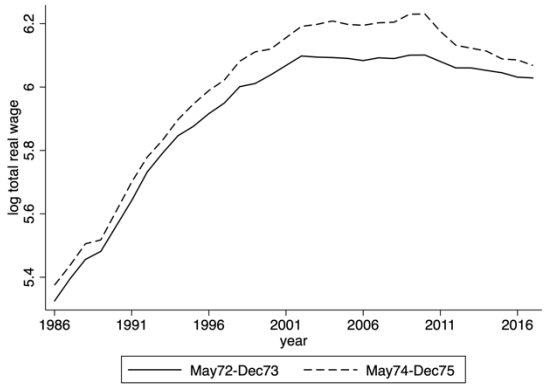


**Figure 4**: By Age Cohort - Log Real Wage of People Hired Between May 1974 and December 1975 versus Those Hired Two Years Before

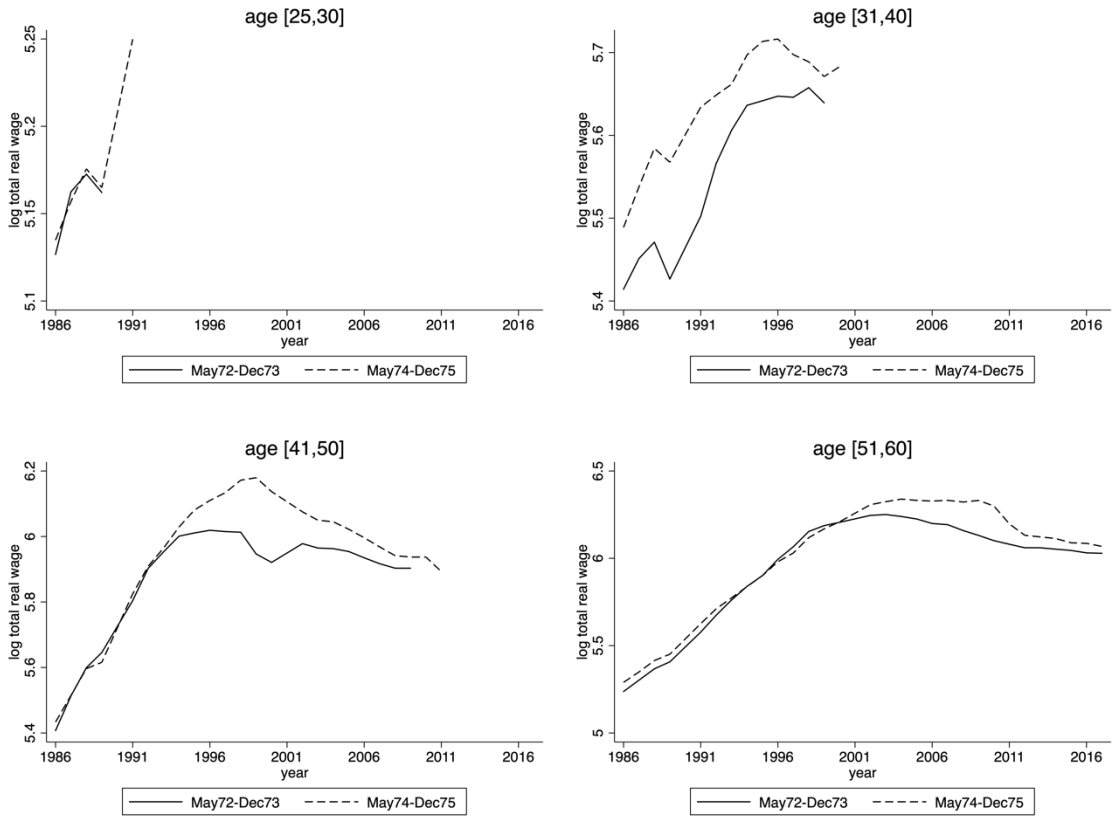
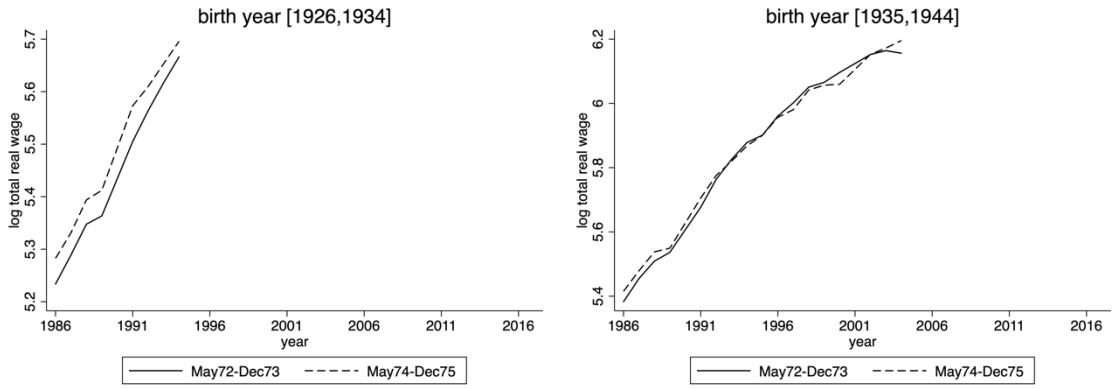



**Figure 5**: By Birth Year Cohort - Log Real Wage of People Hired Between May 1974 and December 1975 versus Those Hired Two Years Before



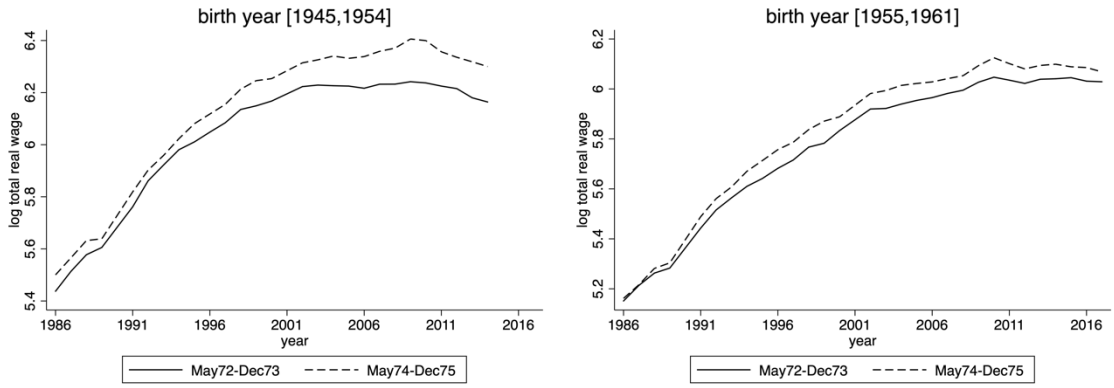



**Figure 6**: By Education Level - Log Real Wage of People Hired Between May 1974 and December 1975 versus Those Hired Two Years Before

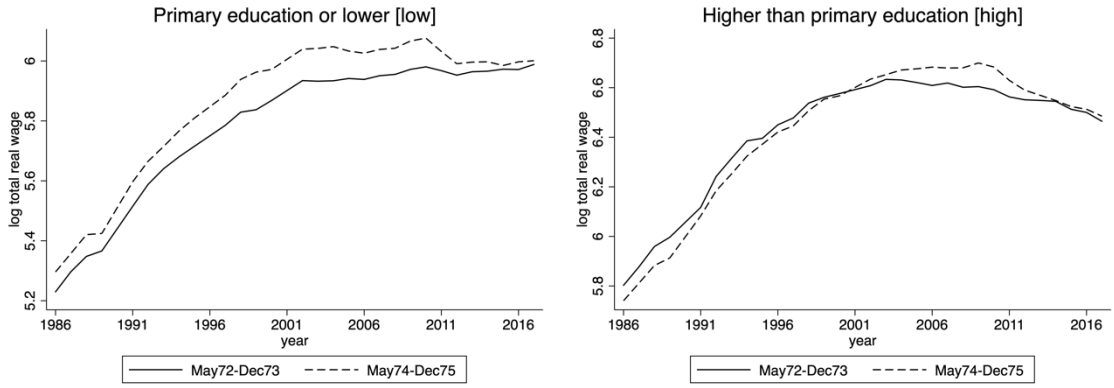



**Table 6**: Difference in Wages by Education

| Mean log total real wage | High | Low | Δ |
|---|---|---|---|
| May 1972 - December 1973 | 6.3372 | 5.6549 | - 0.6823 |
| May 1974 - December 1975 | 6.3396 | 5.7455 | - 0.5941 |
| Δ | 0.0024 | 0.0906 | 0.0882 |

Note: High - higher than primary education; Low - primary education or less.

**Table 7**: Estimates of Effects on the Log Total Real Wage (by Stage of Career)

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| **Early** | |
| treatment | 0.0404** |
| | (0.0007) |
| $R^2$ | 0.5235 |
| Number of observations | 1 672 252 |
| **Non-early** | |
| treatment | 0.0314** |
| | (0.0016) |
| $R^2$ | 0.4504 |
| Number of observations | 317 287 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *loweduc* and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 8**: Estimates of Effects on the Log Total Real Wage (by Stage of Career)

| Log total real wage | **May 74 - December 75** (May 72 - December 73) | |
|---|---|---|
| **High** | Early | Non-early |
| treatment | 0.0233** | - 0.0452** |
| | (0.0016) | (0.006) |
| $R^2$ | 0.3614 | 0.2393 |
| Number of observations | 384 110 | 43 725 |
| **Low** | Early | Non-early |
| treatment | 0.0471** | 0.0421** |
| | (0.0007) | (0.0017) |
| $R^2$ | 0.4484 | 0.3357 |
| Number of observations | 1 288 142 | 273 562 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 9**: Percentage of People Hired in Comparison to Two Years Before

| | **May 74 - Mar 75** (May 72 - Mar 73) | **Apr 75 - Dec 75** (Apr 73 - Dec 73) |
|---|---|---|
| High | - 12.07 % | - 58.07 % |

| | | |
|---|---|---|
| Low | - 14.09 % | - 59.31 % |

Note: High - higher than primary education; Low - primary education or less.

**Table 10**: Estimates Absorbing Firm Heterogeneity

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| **Overall** | |
| treatment | 0.0036** |
| | (0.0005) |
| $R^2$ | 0.7730 |
| Number of observations | 1 970 099 |
| **High** | |
| treatment | 0.0095** |
| | (0.0014) |
| $R^2$ | 0.677 |
| Number of observations | 422 463 |
| **Low** | |
| treatment | - 0.0023** |
| | (0.0006) |
| $R^2$ | 0.765 |
| Number of observations | 1 544 363 |

Note: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early* and sector of activity; standard errors in parentheses.

**Table 11**: Descriptive Statistics (Until Workers Change Firm)

| | Hired between May 1974 and December 1975 | Hired between May 1972 and December 1973 |
|---|---|---|
| Observations | 601 038 | 947 255 |
| Individuals | 97 397 | 155 006 |
| Firms | 18 006 | 19 441 |
| | | |
| Male (% individuals) | 67.6 | 62.19 |
| Age | 44.76 | 44.42 |
| | (8.3807) | (8.2815) |
| Min, Max age | 25, 60 | 27, 60 |
| Min, Max birth year | 1926, 1961 | 1926, 1959 |
| Mean total real wage | 451.6 | 410.55 |
| | (569.6127) | (427.4102) |
| Mean log t real wage | 5.89 | 5.79 |
| | (0.645) | (0.6246) |
| Mean tenure (in years) | 19.53 | 20.87 |

| | | |
|---|---|---|
| | (7.6269) | (7.5106) |
| Birth year cohort (% observations) | | |
| [1926,1934] | 3.1 | 3.08 |
| ]1934,1944] | 15.64 | 15.54 |
| ]1944,1954] | 52.66 | 48.3 |
| ]1954,1961] | 28.6 | 33.08 |
| Age cohort (% observations) | | |
| 25<=age<=30 | 5.65 | 5.49 |
| 31<=age<=40 | 26.21 | 28.38 |
| 41<=age<=50 | 39.95 | 39.63 |
| 51<=age<=60 | 28.19 | 26.5 |
| Education level (% observations) | | |
| Low | 76.44 | 77.83 |
| High | 23.56 | 22.17 |

Notes: Standard deviations in parentheses;

High - higher than primary education; Low - primary education or less.

**Table 12**: Estimates of Effects on the Log Total Real Wage (Until Workers Change Firm)

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| treat | 0.0304** |
| | (0.0007) |
| $R^2$ | 0.5555 |
| Number of observations | 1 548 293 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early*, sector of activity and *loweduc*; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 13**: Estimates of Effects on the Log Total Real Wage (Until Workers Change Firm)

| Log total real wage | **May 74 - December 75** (May 72 - December 73) |
|---|---|
| **High** | |
| treat | - 0.0139** |
| | (0.0018) |
| $R^2$ | 0.3852 |
| Number of observations | 351 566 |

| **Low** | |
|---|---|
| treat | 0.0443** |
| | (0.0008) |
| $R^2$ | 0.4748 |
| Number of observations | 1 196 727 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early* and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 14**: Descriptive Statistics (Falsification Test)

| | Hired between May 1970 and December 1971 | Hired between May 1972 and December 1973 |
|---|---|---|
| Observations | 757 926 | 1 223 751 |
| Individuals | 103 114 | 155 187 |
| Firms | 35 920 | 54 002 |
| | | |
| Male (% individuals) | 65.06 | 62.2 |
| Age | 46.55 | 45.31 |
| | (7.6197) | (8.2401) |
| Min, Max age | 29, 60 | 27, 60 |
| Min, Max birth year | 1926, 1957 | 1926, 1959 |
| Mean total real wage | 418.95 | 410.61 |
| | (517.912) | (431.3053) |
| Mean log t real wage | 5.82 | 5.8 |
| | (0.6159) | (0.6121) |
| Mean tenure (in years) | 19.45 | 17.77 |
| | (9.2683) | (9.4443) |
| | | |
| Birth year cohort (% observations) | | |
| [1926,1934] | 3.22 | 2.47 |
| ]1934,1944] | 19.87 | 13.39 |
| ]1944,1954] | 54.69 | 45.68 |
| ]1954,1961] | 22.22 | 38.46 |
| | | |
| Age cohort (% observations) | | |
| 25<=age<=30 | 1.21 | 4.42 |
| 31<=age<=40 | 22.06 | 25.68 |
| 41<=age<=50 | 42.36 | 39.47 |
| 51<=age<=60 | 34.36 | 30.42 |
| | | |
| Education level (% observations) | | |
| Low | 79.13 | 79.1 |

| | | |
|---|---|---|
| High | 20.87 | 20.9 |

Notes: Standard deviations in parentheses;

High - higher than primary education; Low - primary education or less.

**Table 15**: Estimates of Effects on the Log Total Real Wage (Falsification Test)

| Log total real wage | **May 70 - December 71** (May 72 - December 73) |
|---|---|
| treatment | - 0.0033** |
| | (0.0006) |
| $R^2$ | 0.5174 |
| Number of observations | 1 981 677 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early*, sector of activity and *loweduc*; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 16**: Estimates of Effects on the Log Total Real Wage (Falsification Test)

| Log total real wage | **May 70 - December 71** (May 72 - December 73) |
|---|---|
| **High** | |
| treatment | - 0.0109** |
| | (0.0016) |
| $R^2$ | 0.3283 |
| Number of observations | 413 885 |
| **Low** | |
| treatment | - 0.0046** |
| | (0.0007) |
| $R^2$ | 0.424 |
| Number of observations | 1 567 792 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early* and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 17**: Descriptive Statistics (Hired Before or After the 11th March 1975)

| | Hired between May 1974 and March 1975 | Hired between May 1972 and March 1973 | Hired between April 1975 and December 1975 | Hired between April 1973 and December 1973 |
|---|---|---|---|---|
| Observations | 503 105 | 571 368 | 268 216 | 656 990 |
| Individuals | 64 411 | 74 599 | 33 271 | 81 266 |
| Firms | 31 674 | 31 888 | 18 200 | 35 193 |
| | | | | |
| Male (% individuals) | 67.31 | 62.5 | 68.01 | 61.91 |
| Age | 45.39 | 45.59 | 45.58 | 45.07 |
| | (8.3195) | (8.1345) | (8.3084) | (8.3207) |
| Min, Max age | 25, 60 | 27, 60 | 25, 60 | 27, 60 |
| Min, Max birth year | 1926, 1961 | 1926, 1959 | 1926, 1961 | 1926, 1959 |
| Mean total real wage | 442.62 | 414.61 | 454.24 | 407.14 |
| | (598.629) | (459.37) | (440.0705) | (405.1282) |
| Mean log t real wage | 5.87 | 5.8 | 5.9 | 5.8 |
| | (0.6273) | (0.6181) | (0.6215) | (0.6073) |
| Mean tenure (in years) | 16.77 | 18.22 | 16.43 | 17.4 |
| | (9.2118) | (9.3874) | (9.0939) | (9.476) |
| | | | | |
| Birth year cohort (% observations) | | | | |
| [1926,1934] | 2.48 | 2.61 | 2.51 | 2.33 |
| ]1934,1944] | 13.11 | 14.54 | 14.16 | 12.46 |
| ]1944,1954] | 48.69 | 47.61 | 51 | 44.15 |
| ]1954,1961] | 35.73 | 35.24 | 32.33 | 41.06 |
| | | | | |
| Age cohort (% observations) | | | | |
| 25<=age<=30 | 4.85 | 3.71 | 4.43 | 5.03 |
| 31<=age<=40 | 24.45 | 25.01 | 23.97 | 26.23 |
| 41<=age<=50 | 39.81 | 39.92 | 39.48 | 39.09 |
| 51<=age<=60 | 30.88 | 31.36 | 32.13 | 29.65 |
| | | | | |
| Education level (% observations) | | | | |
| Low | 77.41 | 78.58 | 77.81 | 79.48 |
| High | 22.59 | 21.42 | 22.19 | 20.52 |

Notes: Standard deviations in parentheses;

High - higher than primary education; Low - primary education or less.

**Figure 7**: Log Real Wage of People Hired Between May 1974 and March 1975 and Between April 1975 and December 1975 versus Those Hired Two Years Before

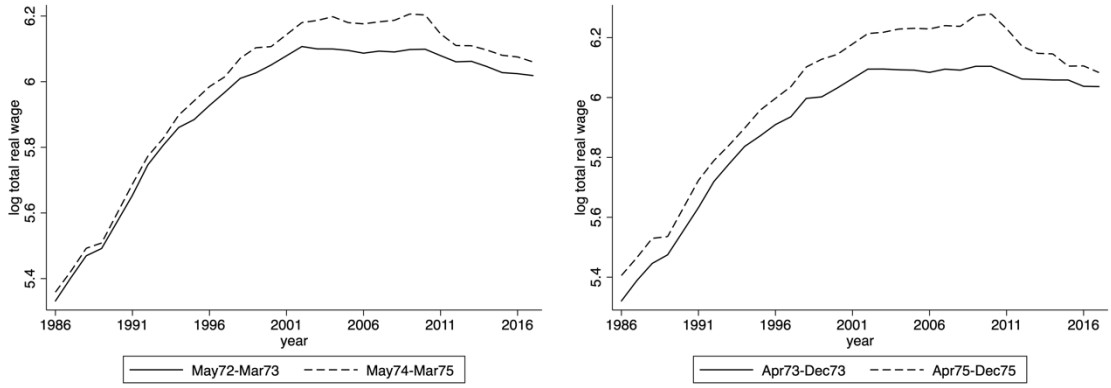



**Figure 8**: By Education Level - Log Real Wage of People Hired Between May 1974 and March 1975 and Between April 1975 and December 1975 versus Those Hired Two Years Before

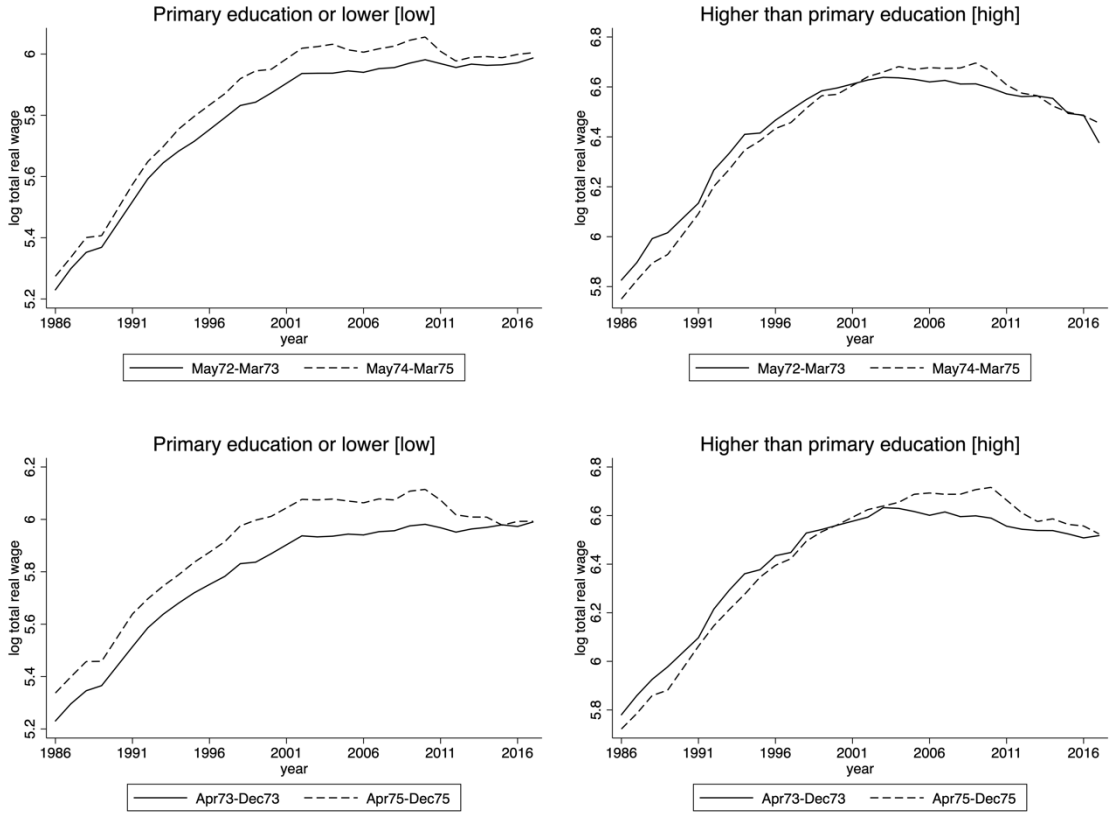


**Table 18**: Difference in Wages by Education (Hired Before or After the 11th March 1975)

| Mean log total real wage | High | Low | Δ |
|---|---|---|---|
| May 1972 - March 1973 | 6.35 | 5.6543 | - 0.6957 |
| May 1974 - March 1975 | 6.3433 | 5.7278 | - 0.6155 |
| Δ | - 0.0067 | 0.0735 | 0.0802 |
| April 1973 - December 1973 | 6.3257 | 5.6582 | - 0.6675 |
| April 1975 - December 1975 | 6.3325 | 5.7794 | - 0.5531 |
| Δ | 0.0068 | 0.1212 | 0.1144 |

Note: High - higher than primary education; Low - primary education or less.

**Table 19**: Estimates of Effects on the Log Total Real Wage (Hired Before or After the 11th March 1975)

| Log total real wage | **May 74 - Mar 75** (May 72 - Mar 73) |
|---|---|
| treatment | 0.03** |
| | (0.0009) |
| $R^2$ | 0.5118 |
| Number of observations | 1 074 473 |

| Log total real wage | **Apr 75 - Dec 75** (Apr 73 - Dec 73) |
|---|---|
| treatment | 0.0508** |
| | (0.001) |
| $R^2$ | 0.5149 |
| Number of observations | 925 206 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early*, sector of activity and *loweduc*; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.

**Table 20**: Estimates of Effects on the Log Total Real Wage (Hired Before or After the 11th March 1975)

| Log total real wage | **May 74 - Mar 75** (May 72 - Mar 73) | **Apr 75 - Dec 75** (Apr 73 - Dec 73) |
|---|---|---|
| **High** | | |
| treatment | 0.0107** | 0.0137** |
| | (0.0021) | (0.0025) |
| $R^2$ | 0.3341 | 0.3503 |

| | | |
|---|---|---|
| Number of observations | 236 050 | 194 331 |
| **Low** | | |
| treatment | 0.0382** | 0.0628** |
| | (0.0009) | (0.0011) |
| $R^2$ | 0.4279 | 0.4389 |
| Number of observations | 838 423 | 730 875 |

Notes: other controls included were tenure, tenure$^2$, age, age$^2$, sex, year dummies, *early* and sector of activity; * significant at the 5% level; ** significant at the 1% level; standard errors in parentheses.