Short-Time Working Arrangements in France during the Crisis: An Empirical Analysis of Firms and Employees[1]

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Abstract

Short-time working arrangements (STWA) aim at avoiding redundancies during short-term downturns or exceptional circumstances (for instance, disasters). Employers applying STWA can temporarily reduce their employees' activity below the legal working time or suspend their business activities. Since the fall of 2008, the economic crisis amplified the use of STWA especially all around Europe. In France, the legal framework of STWA changed between 2008 and 2010 and a new scheme of STW was implemented (called "Activité Partielle de Longue Durée" - APLD). The efficiency of STWA in France over the period of the recent crisis needs to be analyzed. But, we consider that it is important to study first the evolution of the recourse of STWA during the period 2007-2010. The objective of this paper is to describe the main characteristics of firms and employees on STWA during the period of the recent crisis. Thereby we perform a descriptive analysis at both firm and employee levels by using in particular exhaustive establishment data sets of STW authorizations and the French Labour Force Survey (employee data).

Keywords: short-time working agreements, economic crisis, employment protection scheme, microeconomic analysis

JEL-Codes: J08, J68, C35

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1. Introduction

Short-time working arrangements (STWA)[2] aim at avoiding redundancies during short-term downturns or exceptional circumstances (for instance, disasters). Employers applying STWA can temporarily reduce their employees' activity below the legal working time or suspend their business activities. STWA allow employees to maintain a contractual bond with their employer. Employees receive a compensation for their wage loss that is partly paid by the State. Most developed countries use some form of an STWA: the "Chômage Partiel" in France, the "Cassa Integrazione Guadagni" in Italy, the "Kurzarbeitergeld" in Germany, and the "Short-Time Compensation Program" in the United States, etc[3].

Since the fall of 2008, the economic crisis amplified the use of STWA especially all around Europe and thus it opened the public debate about this topic. Countries used these arrangements in order to respond to the strong economic downturn and to preserve jobs by increasing the internal flexibility of firms. In the European Union, many countries implemented new STWA or modified the existing ones (Hijzen and Venn, 2011). In France, the legal framework of STW changed between 2008 and 2010 and a new scheme of STW was implemented (called "Activité Partielle de Longue Durée" - APLD). In France, STWA were not used very intensely before the crisis. On average, between 1995 and 2005, STW authorizations affected nearly 1% of French establishments and 2% of employees in the private sector, excluding agriculture (Calavrezo, 2009). The use of STWA literally exploded during the recession: the number of authorized STW hours increased from 13 millions in 2005 to 257 millions in 2009[4].

In France, the literature on STWA is not very developed, and this is especially true for the period of the recent crisis. Before studying the efficiency of STWA in France over the period of the crisis, we consider that it is important to describe first at a microeconomic level the evolution of the recourse of STWA. The contribution of our paper is twofold. On the one hand, we describe the use of STWA in France by using rich and original firm administrative data on the period 2007-2010. We use exhaustive establishment data sets of STW authorizations (number of STW authorized hours, the type of STW authorization: temporary working-time reduction, temporary layoff, etc.)[5]. We also have additional information on establishment features: sector, size, etc. Information on State's expenses on STW is given by another administrative data source: the India data set. On the other hand, for the first time on French data, we will describe the characteristics of employees on STWA (sex, age, qualification, etc.). For this analysis, we will use the French Labour Force Survey over the period 2003-2010 and we will present into detail the features of employees on STW in 2009 (we choose 2009 as it represents the year with the strongest use of STWA in France). Our analysis will be mainly descriptive and to our knowledge this paper is the first one describing the features of firms and employees on STWA during the recent economic crisis in France.

The remainder of the paper is organized as follows. The second Section describes STW regulations in France. The third Section presents a short survey of the literature on STW in France. The fourth Section describes the data; in this paper we use three different data

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[2] STWA stands for short-time working arrangements and STW for short-time working. We use both terms in this paper.
[3] See for example the recent paper of Arpaia et *al.* (2010) describing STWA in the countries of the European Union. For a description of STW in the United States see Vroman and Brusentev (2009).
[4] For 2005, the source of the data is Dares, DDTEFP and for 2009, the source is DGEFP (see section 4.1).
[5] For each establishment, we estimate the annual number of employees concerned by STW authorizations.

sources: administrative data on State's expenses on STWA, administrative establishment data on STW authorizations and employee data (the French Labour Force Survey). In the fifth Section we present the results. On the one hand we describe the main features of firms on STWA over the period 2007-2010. And on the other hand, we outline the principal characteristics of employees on STWA in 2009.

2. The regulation of STWA in France: a brief description

The French STW scheme is a legal instrument that aims at protecting employment and preventing redundancies in cases of exceptional circumstances, by allowing firms to temporarily reduce working time or suspend their business activities. STW can be applied for the following reasons: downturns in economic cycles; difficulties in the acquisition of raw materials or energy; transformation, restructuring or modernization of the firm; and exceptional natural disasters, among other types of difficulties. According to the law, the instrument should be used as a temporary tool. STW can be considered as a preventive economic assistance program in the sense that its main objective is to prevent permanent layoffs of employees in situations of temporary economic difficulties. Employees on STWA continue to keep their contractual bond with the employer. A compensation system exists in order to indemnify employees' salary losses due to STW.

When facing a strong economic downturn, firms that wish to take advantage of STW have to consult the plant's works council and then apply for an authorization with the French administration at the "department (French territorial division) level" (Unité territoriale - UT). If the request is justifiable, the French administration (UT) provides an authorization for a specified number of STW hours. Only after using STWA, firms receive a compensation from the State.

The STW regulation has changed recently during the period 2008-2010 due mainly to the economic crisis. As our period of analysis is 2007-2010, we exclusively concentrate on the description of the STW regulation after 2008. As the French STW regulation is very complex, we decide to present only the main features of the scheme[6].

In firms with fixed working hours, compensated hours are calculated as the difference between the number of hours that are supposed to be worked and the number of hours effectively worked during the month. With the decrease in legal working hours, the law stipulates that STW is activated when hours worked are less than 35 hours per week, or below collective working hours (if it is inferior to the legal weekly limit). The law also defines the method for calculating compensated hours for the different schemes of the working time reduction implementation.

At the beginning of the first decade of the 21st century, the use of the STW scheme was very low in France. Between 1995 and 2005 the use of STWA strongly decreased related to the reduction of the standard or contractual hours worked per week to 35 hours (Calavrezo et al., 2009a). In 2001, the STW regulation was reformed being directly related to the worksharing implementation: establishments have had to prioritize the use of flexible working hours associated with worksharing. The recent economic crisis was the occasion of "raising from the ashes" this measure. Since the end of 2008, several changes in the STW laws took place with the objective of reinforcing the role of this job protection scheme: an increase in

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[6] For more details on the regulation of STWA in France see Chagny (2010).

the legal duration of STWA (the maximal consecutive duration of STWA changed from 4 to 6 consecutive weeks per year and per employee[7]; the legal maximal duration of STW over the year increased from 600 to 1000 STW hours per employee in all sectors); a better compensation for employees on STWA (an increase of employees' compensation from 50% to 60% of the gross salary) and an increase of the financial support from the State (this support is called specific allocation - *"allocation spécifique"* – and it changed from 2.13 to 3.33 Euros per hour in firms with more than 250 employees and from 2.44 to 3.84 Euros per hour in firms with less than 250 or 250 employees).

The basis of STWA

The allowance paid for every hour of STW includes three components:

- **a specific allocation** (*allocation spécifique)* which is a support paid by the State to the employer. There is a shifting rate for this support: the allocation is 3.84 Euros per hour for firms with less than 250 employees or 250 employees and 3.33 Euros per hour for firms with more than 250 employees. The lower STW specific compensation rate for big firms with at least 250 employees can be explained by the fact that big firms can more easily allocate working hours then smaller firms.

- the national tripartite agreement of 1968 amended in 2009 established that employers pay employees for each hour of STW an amount of 60% of their gross salary with a lower bound of 6.84 Euros per hour. This amount of money represents the sum of the specific allocation of STW and of **conventional allocations of STW**. In exceptional situations, if there are strong threats to employment, the government can pay a higher compensation rate of STW. In this case, STW conventions can be concluded with the State having different coverage rates (50%, 80% or 100%). So, besides the specific allocation of STW, the State pays a complementary allocation related to the concluded convention. For example, for a STW convention with a rate of 100% for a firm with more than 250 employees, for each hour of STW the State pays 3.33 Euros for the specific allocation of STW and 3.51 Euros for the complementary allocation related to the concluded convention (3.33+3.51=6.84 Euros).

In may 2009, a new kind of STW convention was created: the "long lasting partial activity convention" ("Activité Partielle de Longue Durée" – APLD). For each hour of STW covered by an APLD convention, employers receive the specific allocation of STW (3.33 or 3.84 Euros depending upon the size of the firm) and an APLD allocation. For the APLD allocation, the first 50 hours covered by an APLD convention are paid by the State (1.90 Euros per hour). If the number of hours covered by the APLD convention exceeds 50 hours, the number of excess hours is compensated by the Unédic (the institution that pays unemployment benefits in France). In this case, the Unédic pays employers 3.90 Euros per hour no matter the size of the firm. For example, a firm which has less than 250 employees and which puts them on STW for 40 hours being covered by an APLD convention, will receive from the State 3.84 Euros per hour for the specific allocation of STW and 1.90 Euros per hour for the APLD allocation.

- **a complementary allocation which guarantees employees a minimum legal monthly remuneration equal to the net level of the minimum wage** (Smic)[8].

As STWA were intensively used during the period of the crisis and as employees on STWA suffer from the effects of an important salary loss, in may 2009, the government, the social partners and the institution in charge of the unemployment insurance (Unédic) decided to adopt a new STW agreement permitting a better compensation for employees and covering longer periods of time. This scheme is called "long lasting partial activity" ("Activité Partielle de Longue Durée" – APLD)[9]. This kind of agreement was consistently favoured by the

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[7] Total STW is a special situation of STW in which an employee is on STW more than six consecutive weeks. At that point, the work contract ends.

[8] Since January 1, 2010, employees must receive at least 6.96 Euros net per hour (temporary workers, apprentices, part-time employees are not concerned). When an APLD convention is concluded the amount of money given to employees can not be inferior to the minimum legal monthly remuneration.

[9] An APLD agreement is concluded between a professional or an inter-professional organisation or a firm and the Ministry of Employment, the prefect or the head of the French administration at the department (French

French administration as it is more attractive for both firms and employees. An APLD agreement has the same legal basis as "regular" STW schemes (recourse conditions, maximal number of STW hours, etc.) and it covers a maximal period of compensation of 12 month. APLD agreements permit a higher compensation for employees than "regular" STWA (APLD covers 75% of the gross salary in comparison with 60% for "regular" STWA). The compensation of an APLD agreement is financed by the State and by the Unédic. When an APLD agreement is signed, firms commit to preserve the employment of employees on STW during a period of time equal to the double of the period of the agreement. If firms do not respect this condition they have to reimburse the STW and APLD compensations.

Since November 2009, the French Labour Code has been making an explicit mention of the possibility of suspending the employment contract and of being trained during STW periods. In the STW regulation, the articulation between STW and training is not compulsory but only encouraged. Nevertheless, when signing an APLD agreement, an employer commits to proposing each employee on STWA an individual interview in order to explore the possible training actions to develop. "Regular" STW agreements may also allow training commitments. The training measures which can be joint with STWA are: training plan, professionalization period, individual right to training (DIF) or personal leave for training (CIF). Initiatives taken by the government, regions, social partners and firms to clarify the interpretation of the law, to implement and to fund training have developed since 2009 (Chagny, 2010).

After using STW, employers must address each month a request for compensation to the French administration indicating the amount to be reimbursed. If the firm does not comply with these procedures, the employer must pay "standard" wages. Additionally, social contributions on the STW compensation are lower[10].

3. A short survey of literature

In a theoretical perspective, the international literature clearly distinguishes the security and flexibility roles of STWA which differentiate North American and continental European systems (see the three seminal papers on this topic: Van Audenrode (1994), Houseman and Abraham (1993) and Burdett and Wright (1989)). Van Audenrode (1994) shows that major fluctuations in working hours could be generated only if the STW system is more generous than the traditional unemployment insurance system. More precisely, by analyzing 10 OECD countries, Van Audenrode (1994) shows that in countries with generous STW systems the speed of adjustment of the total worked hours is higher in Europe than in the US, despite a much slower adjustment in number of employed workers. Because it is more difficult in European countries to fire a worker or to lay one off, STW is a mechanism that makes these discharges less necessary. Similarly, Houseman and Abraham (1993) consider that in France, STW is a cheap labour force adjustment mode which raises the firm's cost of declaring redundancies. It is due to the low flexibility of the French labour market. However, the flexibility role of STW is not convincing for the US, where external flexibility is less expensive, and so the STW program is relatively more costly than in Europe. It is mainly a

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territorial division) level (*UT – Unité territoriale*). Conventions could be concluded at a national, regional or departmental (French territorial division) level and firms can easily subscribe by filling in a subscription form.

[10] The STW compensation is exempt of employer social contribution taxes, but is subjected to the supplementary social security contribution ("CSG") and to the contribution to the repayment of social security debt ("CRDS").

job security instrument and its efficiency is discussed (Burdett and Wright, 1989). For Burdett and Wright (1989), the STW recourse boosts work sharing in the sense that it does not lead to layoffs.

STWA in France were not intensively analyzed in the literature.

A first category of papers studies the functioning of this measure: on the one hand, there are some papers on the description of STWA in France (see for example, Béraud, Lefèvre and Sidhoum, 1994) and on the other hand, there are papers comparing the French STW with similar measures from other countries (Mosely, 1995; Béraud, 1994). Béraud, Lefèvre and Sidhoum (1994) interview firms using STW at the beginning of the 90's. They describe in detail STWA before 1995, focusing their analysis on the motivations of using these agreements. Their main conclusion is that STW became progressively a permanent device of working time management contrary to sense of the law. Mosely (1995) analyses STW in France, Germany, Italy and Spain. One of the conclusions of his study is that the articulation between STW and training is very difficult to put in practice.

A second category of papers deal with the statistical analysis of STW in France. Valdèlievre (2007) studies the measure by sector and firm size in 2005. As for Chouvel (1995), he analyses the relationship between STW and the economic situation and shows that the use of this scheme evolves in a countercyclical way.

A third category of papers is focused on the theoretical analysis (the theory of implicit contracts) and on the econometric analysis of STW (Abraham and Houseman, 1994; Gray, 1998). These papers concentrate on the relationship between STW and redundancies. They show a quite "positive" effect of STW on redundancies. Recently, using evaluation econometric techniques, three papers analyze the use of STW in France on the 1995-2005 period[11]. These papers study the determinants of the STW measure as well as its efficiency. The flexibility role (Calavrezo et al., 2009a) and protection role of STWA in terms of the relationship between this agreement and redundancies or establishment exit (Calavrezo, 2009b; Calavrezo et al., 2010) are analyzed. These analyses were carried out at the firm level. Calavrezo et al. (2009a) show a "substitution" effect between working time reduction (WTR) and STW over the 1995-2005 period. Their paper suggests that WTR has refocused the STW program away from its initial role of retaining employees. In another paper, Calavrezo et al. (2009b) analyze the relationship between STW authorizations and redundancies for establishments with at least 50 employees during the period 1996-2004. Controlling for the magnitude of the negative shock to labor demand, they show that establishments that use STW more intensively lay off more employees. Their results suggest that on average firms simultaneously lay off some of their workers and place others on the STW program. Finally, Calavrezo et al. (2010) analyze the relationship between STW and establishment exit over the period 2000-2005. The authors propose an econometric method that takes into account several important economic health indicators (value-added variation rate and apparent labor productivity). Their main result points out that having STWC authorizations in the current year impacts positively and significantly the probability for an establishment to exit the market the following year.

To our knowledge, on the period of the recent crisis the literature on STWA in France is almost inexistent. There are only some macroeconomic papers which deal indirectly with the French STWA (Arpaia et *al.,* 2010; Hijzen and Venn, 2010) or describe only the functioning of the measure (Chagny, 2010).

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[11] For a complete description of STWA between 1995 and 2005 see Calavrezo (2009c).

Arpaia et *al.* (2010) analyse the role of STWA during the crisis in the EU countries. They estimate a panel of all the 27 European countries for the period 1991Q1-2009Q3. They show that STWA seem to have been effective in reducing the variability of employment during the global recession.

Hijzen and Venn (2010) analyze STWA during the 2008-2009 crisis in 19 OECD countries[12]. A key feature of their analysis is that it consistently differentiates between permanent and temporary workers when looking at employment and average hours worked. The authors adopt a difference-in-differences approach and show that STW schemes had an economically important impact on preserving jobs during the economic downturn, with the largest impacts of STW on employment in Germany and Japan. However, the positive impact of STW was limited to workers with permanent contracts. The estimated jobs impact is smaller than the potential number of jobs saved as implied by the full-time equivalent number of participants in short-time work, suggesting that STW schemes end up supporting some jobs that would have been maintained in the absence of the subsidy.

Chagny (2010) describes the legal framework of STWA in France and presents some very aggregated figures. Chagny (2010) underlines that STWA has not been the main solution chosen by French firms to adjust their costs during the crisis. In contrast, there has been a massive reduction in the number of temporary workers or workers with fixed-term contracts. Also, for Chagny (2010) it is too early to asses the integration of vocational training with STWA as several obstacles emerged regarding the implantation of training in firms.

In order to fill the gap in the literature concerning French STWA during the recent economic crisis, and before studying the efficiency of these measures, in this paper we will proceed to a descriptive microeconomic analysis of the recourse of STWA for both firms and employees on the 2007-2010 period.

4. The data

We first present the administrative data indicating the cost for the State for STWA (Section 4.1). Then, in Section 4.2, we describe the administrative data used to analyze establishments' STW authorization behavior. Finally, in Section 4.3 we present the French Labor Force Survey used to study the features of employees on STWA.

4.1. The India data set

In order to analyze the cost for the State for STWA, we use administrative data obtained from the India software. The India software is a budgetary device; it permits to centralize data on State's expenses in various fields. This software was implemented progressively in 2006. Information on State's expenses on STW is available for each month and each department (French territorial division)[13]. We decide to present in this paper only the evolution of the annual aggregated cost of STW. The interest of using this data source is high as it represents the only file indicating precisely the expenses on STW.

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[12] See also the similar paper of Cahuc and Carcillo (2011) .
[13] State's expenses on STW correspond to programme 103 and more precisely to 5 articles: 22, 25, 28, 40 and 58. These articles correspond to expenses on the specific and complementary allocations of STW.

4.2. Establishment administrative data

The files we use in this paper give information about the STW authorizations obtained by French establishments between 2007 and 2010. They are administrative exhaustive databases processed by the Department of the French Ministry of Employment in charge of implementing STWA (DGEFP). When facing a strong economic downturn, an employer can request a specified number of STW hours for a number of employees. If the request is justifiable, the French administration (the Territorial Unit - UT) provides an authorization for a specified number of STW hours. Only after using STWA, firms receive a compensation from the State.

The data used here contain information on the number of STW authorized hours and the amount of money authorized by the French administration for the specific allocation of STW (*allocation spécifique*) as well as several other variables[14]:

- the date and the duration of the STW authorization (the date of the start of the STW authorization and the date of the end of the STW authorization),
- the number of employees concerned by the STW authorization (total number of employees and number of employees by three occupational categories: executive; white-collar worker, technician or supervisor; blue-collar worker),
- the reason of using STWA (six reasons are available: downturns in the economic cycle; difficulties in the acquisition of raw materials or energy; disasters; exceptional bad weather; transformation, restructuring or modernization of the firm; other types of exceptional difficulties),
- the perimeter of the STW recourse (four possible types of STW recourse: the whole establishment with working time reduction; the whole establishment with cessation of activity; a part of the establishment with working time reduction; a part of the establishment with cessation of activity).

Other establishment characteristics such as sector, size and geographical location are also available.

So, for each STW authorization we know the total number of STW hours and the amount of money authorized by the French administration for the specific allocation. These elements are given for the whole period of the authorization. The Statistical Department of the French Ministry of Labour (DARES) presents monthly information on STW authorizations[15]. We decide to adopt the same methodology. Thus, for each establishment and for each month, we estimate the number of authorized hours of STW and the amount of money authorized by the French administration for the specific allocation. We calculate the monthly number of STW authorized hours (and the monthly amount of money authorized by the French administration for the specific allocation) in proportion to the number of working days[16] of STW which was authorized during the month with regard to the total number of working days over the period. For example, an establishment received a STW authorization for 3 months from July 9, 2010 to September 30, 2010 (15 working days in July, 22 working days in August and 22 working days in September) for 100 hours. According to the methodology

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[14] Data also indicate wheather STW authorizations took place within an APLD agreement. For the moment, we decide not use this information.
[15] See http://www.travail-emploi-sante.gouv.fr/etudes-recherche-statistiques-de,76/statistiques,78/chomage,79/les-series-statistiques,265/les-series-mensuelles-de-l,11788.html
[16] We exclude Saturdays, Sundays and other national holidays.

adopted in this work, in July, we consider that this establishment received authorization for 25 hours of STW (=100*(15/(15+22+22))).

The authorized STW imperfectly measures the actual STW compensation received by establishments from the State. Indeed, some establishments can decide not to use STW authorized hours or to use less STW hours. In the databases we use, the number of STW compensated hours as well as the amount of the compensation are also available at the establishment level but their quality remains to be proven. Thus, for the moment, we decide to use only the information on STW authorizations.

The descriptive statistics on establishments presented in section 5.2 are quarterly.

### 4.3. The French Labour Force Survey

In order to analyze employees on STW, we use data from the French Labour Force Survey (FLFS). The FLFS is produced by the French Institute for Statistics and Economics (Insee). To our knowledge, this data source is the richest in terms of individual characteristics for studying individuals on STW. The FLFS was launched in 1950 and in 1982 it was organized as an annual survey. Since 2003, the FLFS has become a continuous quarterly survey. It covers private households in metropolitan France and all 15 years old or more individuals in the household are surveyed. People are surveyed in a reference week. Each quarter consists in 13 reference weeks. The sample is representative of the French population each quarter. Each quarter, information on 75 000 persons 15 years old or more is available in the data.

The Insee uses the FLFS for publishing each month a statistic on STW[17]. Their indicator is calculated on the population of individuals in employment and actually, it represents the third modality of the variable of underemployment. So, the main purpose of the Insee variable is not to measure directly STW but to identify people on underemployment i.e. its principal objective is to indentify part-time workers who would like to work more, who are available to work more immediately and who are searching or not a new employment. The third modality of underemployment contains individuals who declare themselves on STW and are not in the two first categories of the variable underemployment. In other words, people declaring themselves on STW (as they do not work during the week of reference for STW or they reduced they working time during the reference week for STW) could be in the two other categories of the underemployment variable.

We retain a different definition for individuals on STW. First, we are interested directly in the declaration of individuals of being on STW. Second, we cover only individuals who according to the law can be in the field of incidence of the scheme. Thus, we restrained our field of analysis on the employees of the private sector. For this reason, there are some differences between the two measures (see figures 1 et 2).

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[17] See http://www.insee.fr/fr/indicateurs/ind14/20110303/sl_sousemploi.xls

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Figure 1: Comparison of the two indicators of STW (number of employees) between 2003 and 2010
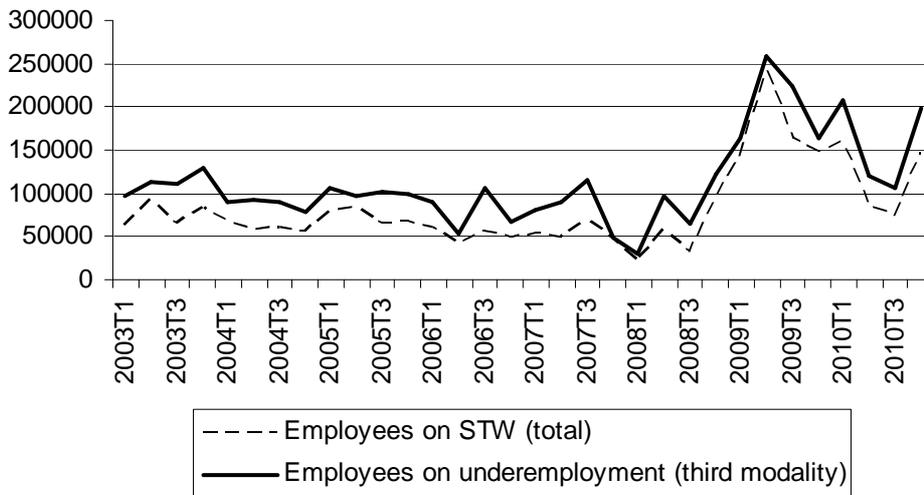
Source : French Labour Force Survey (2003q1-2010q4).
Field: The variable "employees on STW" is calculated on employees in the private sector declaring themselves on STWA. The variable "employees on underemployment (third modality)" is the variable calculated by the Insee on the field of individuals in employment. Data are weighted and seasonally adjusted.
Lecture: In 2009q2, 240 000 employees in the private sector declare being on STWA during the reference week according to the variable "employees on STW" and 260 000 individuals in employment are in the third modality of the variable underemployment.

Figure 2: Comparison of the two indicators of STW (part of employees) between 2003 and 2010
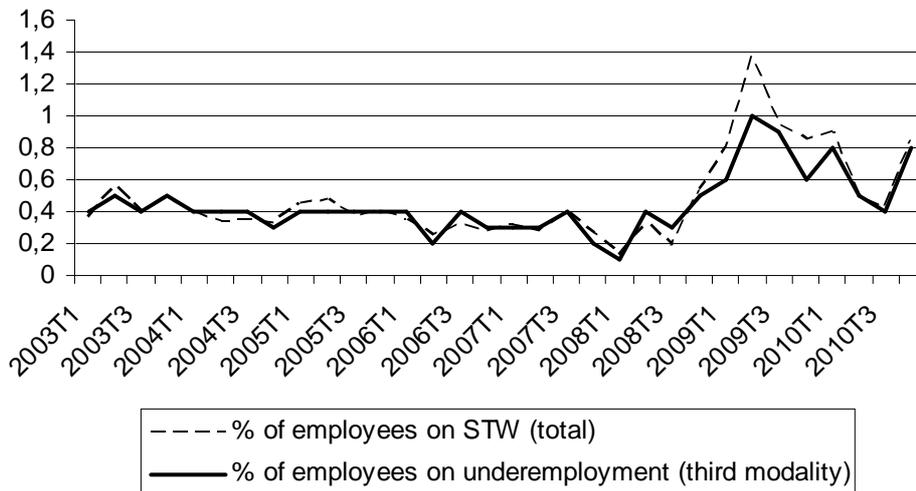
Source : French Labour Force Survey (2003q1-2010q4).
Field: The variable "employees on STW" is calculated on employees in the private sector declaring themselves on STWA. The variable "employees on underemployment (third modality)" is the variable calculated by the Insee on the field of individuals in employment. Data are weighted and seasonally adjusted.
Lecture: In 2009q2, 1,4% of employees in the private sector declare being on STWA during the reference week according to the variable "employees on STW" and 1% of individuals in employment are in the third modality of the variable underemployment.

More precisely, in order to identify people declaring themselves on STWA, we use two variables from the FLFS:

- the first variable permits the identification of individuals who declare being absent from work during the week of reference by reason of STW (the *RABS* variable);
- the second variable permits the identification of individuals declaring a non-zero number of hours or days during the week of reference by reason of STW or bad weather (the *EMPAFC* variable).

So, our variable of interest *STW* is a dummy variable which equals 1 if an employee of the private sector declares being absent from work during the week of reference by reason of STW or if he or she declares a non-zero number of hours or days during the week of reference by reason of STW or bad weather; otherwise *STW* equals 0.

Two observations must be made regarding the quality of the identification of individuals on STW:

- first, as the FLFS is a survey, we work with individuals' declarations;
- second, the variable *EMPAFC* mixes two different concepts: STW and bad weather[18].

There are some errors related to individuals' declarations with regard to STW (see Appendix 1).

Descriptive statistics are exclusively presented, for the moment, for the year 2009. This year represents the year with the strongest use of STW. Statistics are calculated by pilling up the 4 quarters of 2009. They may however vary in function of the period of analysis. Further tests must be done in order to continue the evaluation of the data source.

5. The results

Section 5.1 presents State's expenses on STW. We then outline some descriptive statistics on the period 2007-2010 for French establishments (Section 5.2). Finally, the features of employees on STW are presented for the year 2009 (Section 5.3).

5.1. How much did the STW measure cost to the French State during the recent crisis?

On average, from 2000 until 2008, the State paid 21 million Euros for the STW measure. In 2009, the expenses literally exploded: nearly 320 million Euros were paid in 2009. In 2010, the amount of the expenses remains high: 280 million Euros were spent by the State for this scheme. Additionally, in 2009, the Unédic (the institution that pays unemployment benefits) paid an extra of 40 million Euros for APLD agreements.

Figure 3 describes the evolution of State's expenses on STW since 1996 until 2010. As for Figure 4, it presents for 2009 (the year with the most important STW recourse) the State's expenses per department (French territorial division). We notice that the most industrialised and above all most populated departments (French territorial divisions) correspond to the most important expenses of STW.

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[18] For example, for 2010q4, Insee explains the increase in the part of people on STW (the third modality of the variable underemployment) by the fact that winter was particularly tough in France at that moment and for this reason many people probably declared themselves being on STW because of the bad weather.

In addition, Appendix 2 presents the evolution of the amount of money authorized by the French administration for the specific allocation of STW.

Figure 3: State's Expenses on STWA between 1996 and 2010
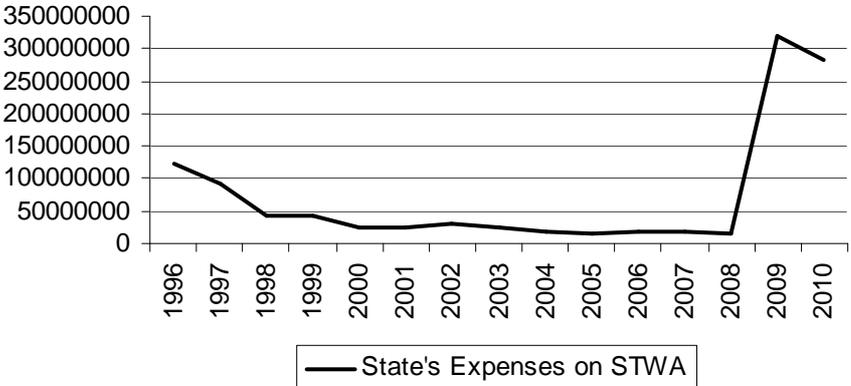
Figure 4: State's Expenses on STWA in 2009

6 400 000 - 15 600 000
2 700 000 - 6 400 000
1 700 000 - 2 700 000
1 000 000 - 1 700 000
0 - 1 000 000

12
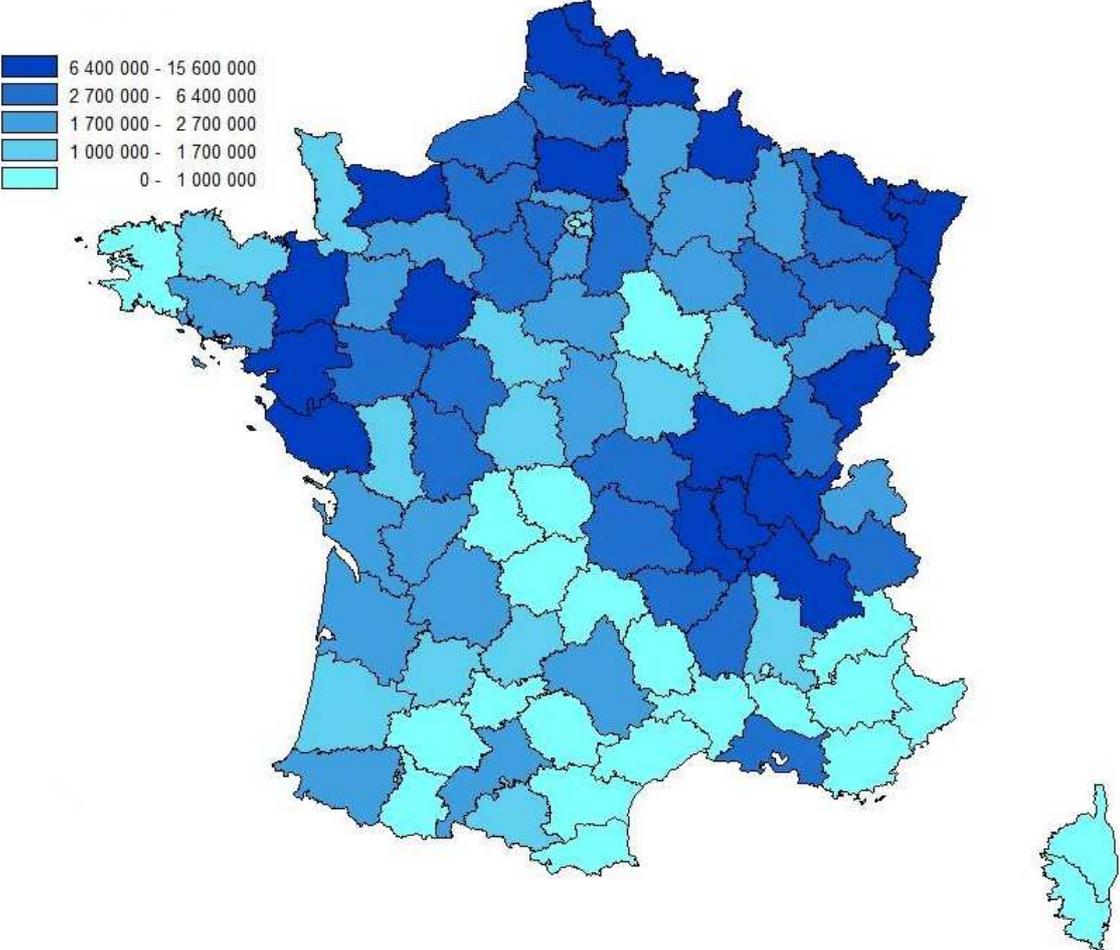
5.2. The characteristics of establishments using STWA

In this section we present the evolution of the STW recourse during the period 2007-2010. The main indicator used here is the number of STW authorized hours. We will first emphasize the strong increase in the STW authorizations during the period of interest and then we will describe the characteristics of the establishments with STW authorizations.

Figure 5 presents the quarterly evolution of the number of STW authorized hours between 2007 and 2010[19]. We can observe a very important increase in the number of STW authorized hours beginning with the last quarter of 2008 (21.6 million of STW authorized hours). In 2007q1, 2.7 million hours of STW were authorized in France. Two years later (2009q2), STW authorizations reach their maximum value over the period of analysis: 75.5 million STW hours are authorized. Between 2007q1 and 2009q2, the number of STW authorized hours was multiplied by almost 30. 2009 represents the year with the highest recourse of STWA. Globally, in 2009, 257 million of hours of STW were authorized. In 2010, even if the level of STW authorizations is still high it begins to decrease progressively. So, Figure 5 also shows that STW authorizations follow the economic situation (a countercyclical evolution): the number of STW authorized hours increases during downturn periods and decreases when the economic situation gets better. We recall that in 2008 and 2009 several changes occurred in the STW regulation which simplified the access to the scheme and, in the same time, encouraged firms to use it.

Figure 5: The evolution of STW authorized hours between 2007 and 2010
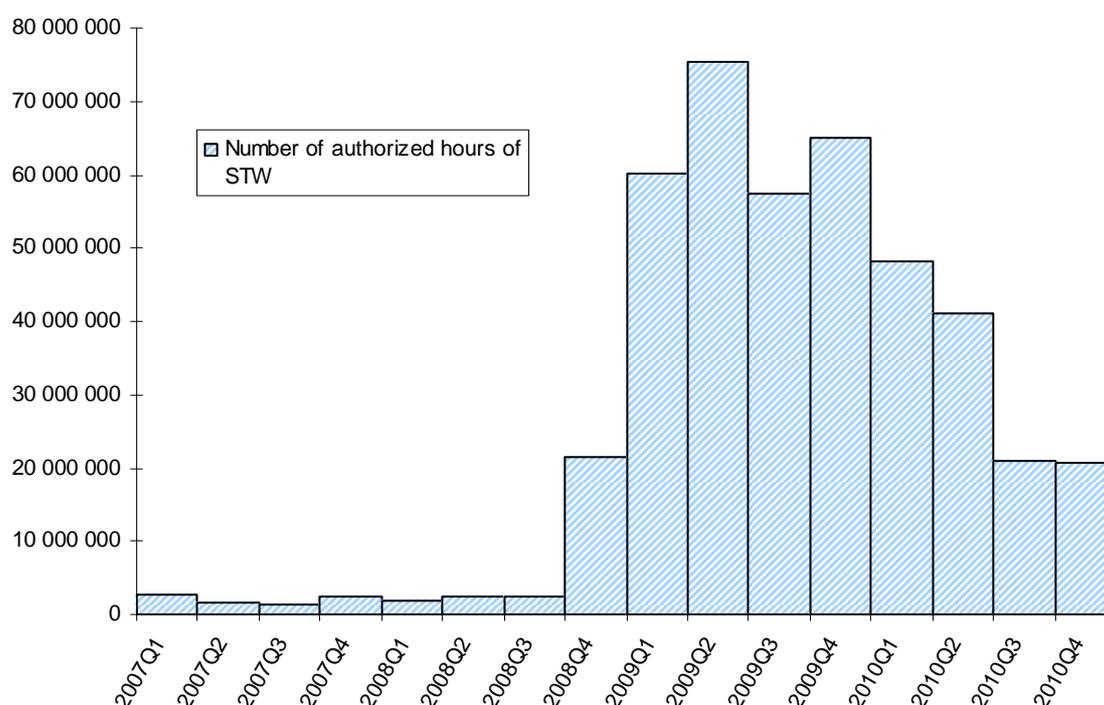
Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

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[19] See in Appendix 2 the indicator of the amount of money authorized by the French administration for the specific allocation of STW. It follows perfectly the evolution of the number of STW authorized hours.

Without any surprise, industry is the main sector in which STW is authorized (see Figure 6 and Appendix 3). On average, between 2007 and 2010, 82% of STW hours were authorized in the industry. Between 1995 and 2005, nearly 80% of STW days were also authorized in the industry (Calavrezo, 2009c). This result shows that despite the period of analysis, this feature seems stable over time. The mainly commercial services sector represents about 11% of the total number of STW authorized hours. In the other sectors, the recourse to STW is quite marginal. Between 2007 and 2010, 1.6% of the STW hours were authorized in the agriculture sector. As for the citizen services sector, it covers on average on the period of analysis 2.4% of the STW authorized hours. 4% of the STW hours were authorized in the construction sector between 2007 and 2010.

Figure 6: The distribution of STW authorized hours by sector between 2007 and 2010
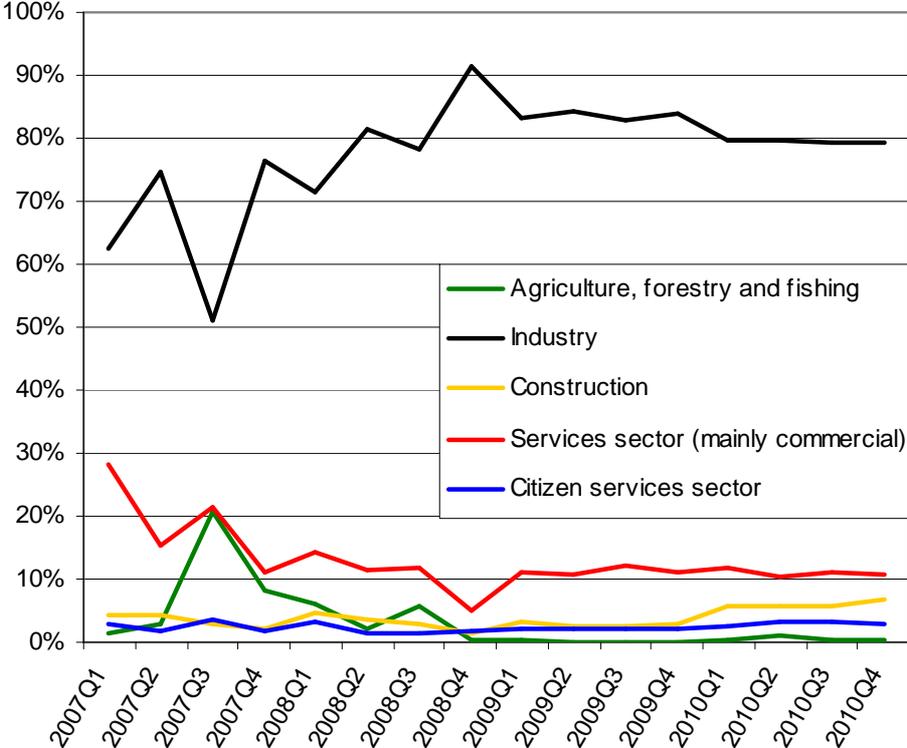
Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Figure 7 and Appendix 4 present the distribution of STW authorized hours within the main industry sectors. On average, between 2007 and 2010, 31% of STW hours in the industry sector were authorized in the manufacturing industry. The textile and apparel industry represents nearly 5% of the total number of STW hours authorized in the industry sector. Until the start of the economic crisis (2008q4), the textile and apparel industry covered a fifth of the number of STW authorized hours. The percentage dropped brutally to 4% for the rest of the period of analysis. The metalworking industry covers, on average, 9% of the number of STW authorized hours on the period 2007-2010. This percentage is a little bit more important for the machinery and equipment industry (13%). Since the beginning of 2009, the part of these two industries within the total number of STW hours authorized in the industry sector strongly increased (see Figure 7). The car industry, which traditionally uses the scheme in an intensive way covered 23% of the STW authorized hours.

Figure 7: The distribution of STW authorized hours by industry sectors between 2007 and 2010
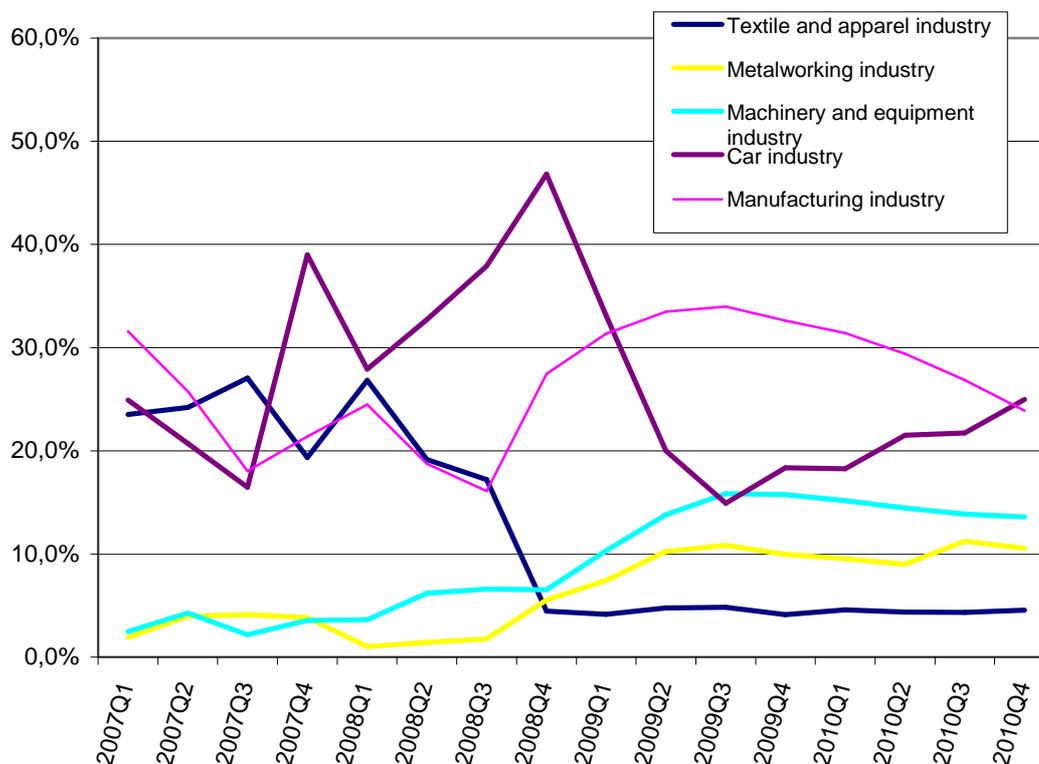
The establishment size is also a potential determinant of STW authorizations (see Figure 8 and Appendix 5). As in a previous work on STW authorizations covering the period 1995-2005 (Calavrezo, 2009c), establishments with at least 50 employees are the main beneficiaries of STW authorizations. On average, between 2007 and 2010, almost 40% of STW hours were authorized for establishments with at least 250 employees and 33% for establishments from 50 to less than 250 employees. Establishments with less than 50 employees cover, on average, 28% of STW authorized hours (13% for establishments with less than 20 employees and 15% for establishments from 20 to less than 50 employees). Since the beginning of the economic crisis, Government's measures regarding STW aimed at favouring small firms. We can notice that Figure 8 does not reveal such a trend for small establishments.

Figure 8: The distribution of STW authorized hours by establishment size between 2007 and 2010
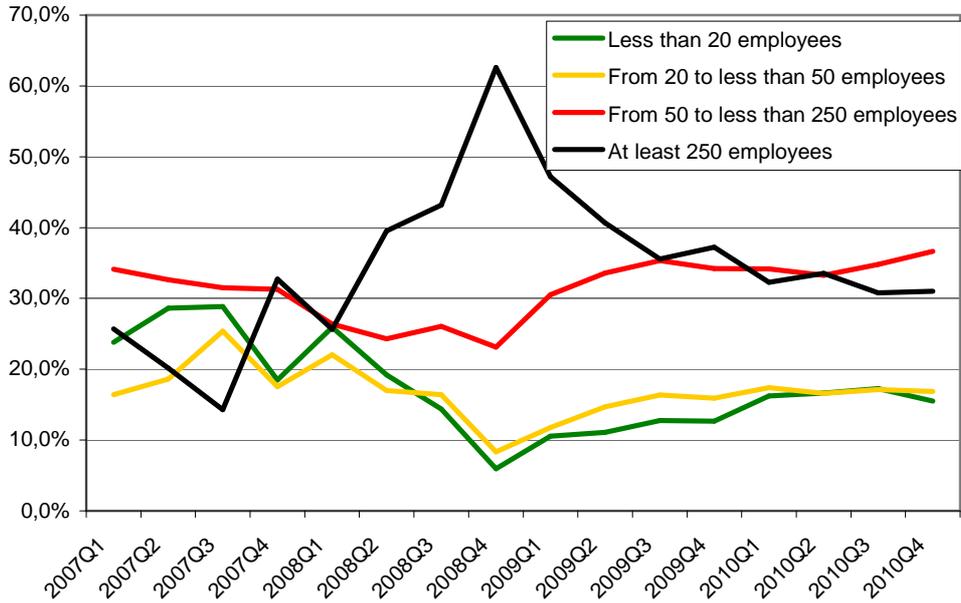
Between 2007 and 2010, 97.4% of STW hours were authorized on average for downturns in the economic cycle (see Figure 9 and Appendix 6). Before 2008q4, this reason of recourse to STW represented 74% of the authorized hours and since 2008q4, the motive "downturns in the economic cycle" was 14 points greater (it covered 98% of STW authorized hours).

Figure 9: The distribution of STW authorized hours by reason of using STW between 2007 and 2010
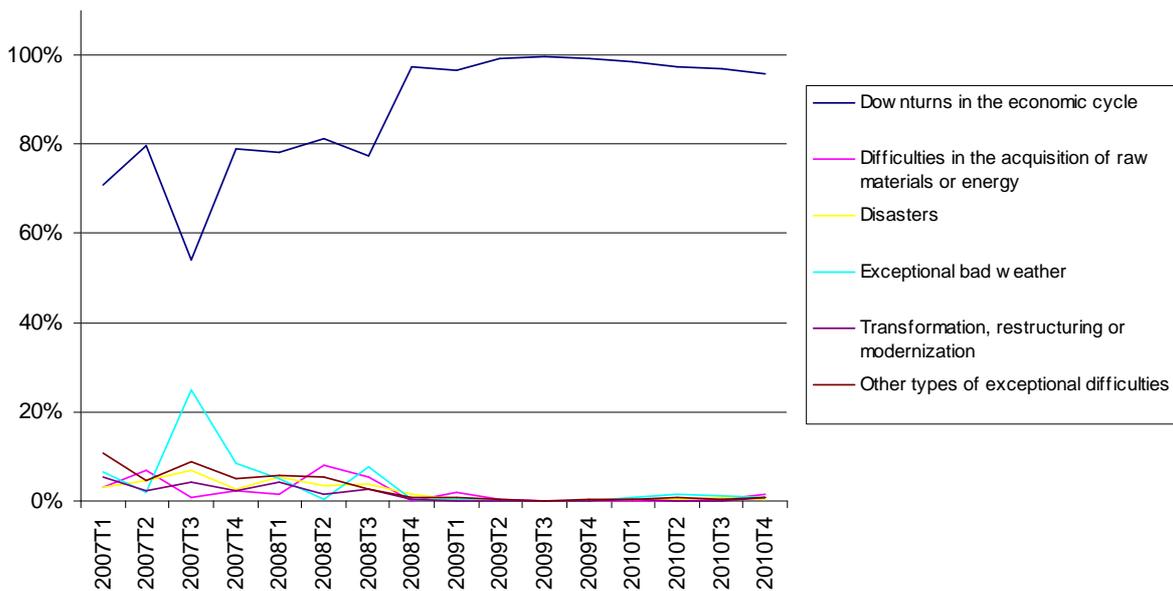
On average, between 2007 and 2010, 51% of the STW hours were authorized for establishments that reduce their working time for all their employees and 42% of the STW hours were authorized for establishments that reduce their working time for a part of their employees (Figure 10 and Appendix 7). We can then conclude that during the crisis STW authorizations were mainly used by reducing working time (for more than 90% of authorizations). This was also the case for the period 1995-2005 (Calavrezo, 2009c). On the other hand, the distribution of these two types of STW recourse was different: between 1995 and 2005, on average, 20% of STW days were authorized with working time reduction for all the employees of the establishment and 70% with working time reduction only for a part of the employees of the establishment.

Figure 10: The distribution of STW authorized hours by perimeter of the STW recourse between 2007 and 2010
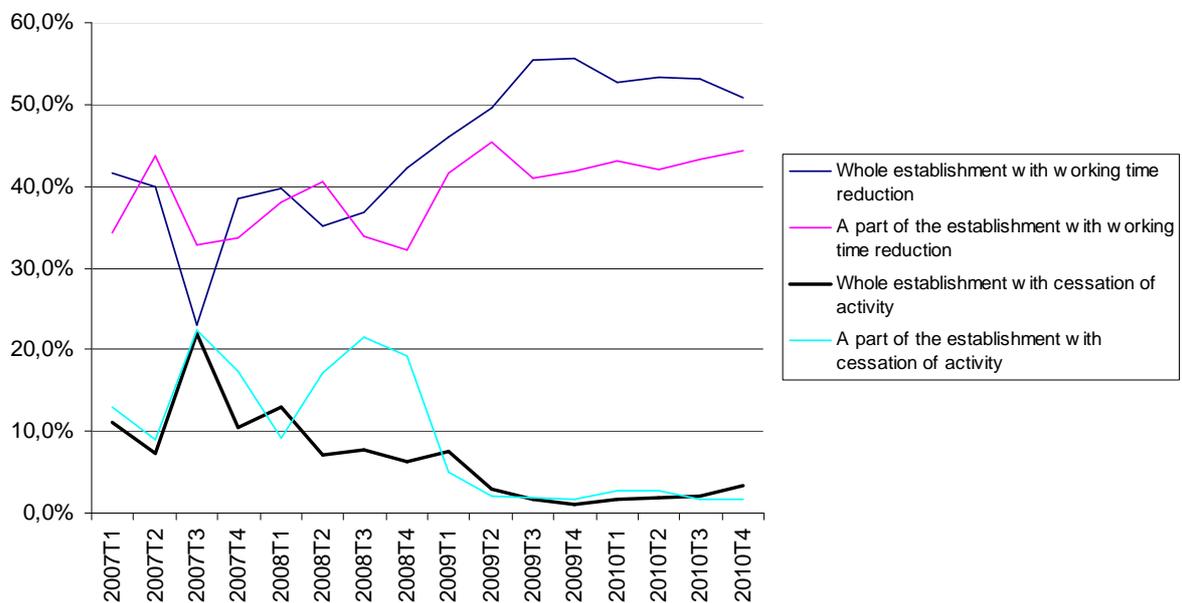
Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

The identification of the number of employees concerned by the authorizations of STW is not trivial. We recall that for each STW authorization we have the number of employees concerned by the measure (total number and number of employees by occupational categories). The problem is that for the same year we can observe multiple authorizations per establishment. For each establishment, we calculated two STW employee annual indicators:

- *STW_empl_avg*: this indicator is calculated as the annual average of employees concerned by STW authorizations;
- *STW_empl_max*: this indicator is calculated by considering the maximum number of employees per occupational categories per year concerned by the STW authorizations[20].

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[20] For example, an establishment has two STW authorizations in 2008. For the first authorization, 10 employees were concerned by STW (6 blue-collar workers, 2 white-collar workers, technicians, supervisors and 2

Table 1 presents the number of employees concerned by the STW authorizations according to these two definitions. As expected, the annual number of employees concerned by STW authorizations is superior for the second indicator (*STW_empl_max)*. With the first definition, 840 000 employees were concerned by STW authorizations in 2009 and this second definition the number of employees concerned by the scheme is 1.1 million. Blue-collar workers are the most concerned occupational category by the STWA. For example, in 2009, 70% of employees with STW authorizations are blue-collar workers. Executives represent the occupational category the less concerned by the scheme (2% of employees in 2007).

Table 1: Estimation of the number of employees concerned by STW authorizations

	Number of employees concerned by the STW authorizations per year	Blue-collar workers	%	White-collar workers, technicians or supervisors	%	Executives	%
STW_empl_avg							
2007	62 268	53 098	85%	8 112	13%	1 058	2%
2008	271 690	220 462	81%	41 503	15%	9 724	4%
2009	838 468	585 364	70%	188 044	22%	65 060	8%
2010	430 339	302 255	70%	101 429	24%	26 655	6%
STW_empl_max							
2007	88 925	74 675	84%	12 061	14%	2 189	2%
2008	335 842	275 389	82%	49 282	15%	11 171	3%
2009	1 114 769	777 742	70%	248 554	22%	88 473	8%
2010	573 847	398 298	69%	137 254	24%	38 295	7%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

5.3. *What are the characteristics of employees on STWA in France?*

Figure 11 presents the evolution of the number of employees in the private sector declaring themselves on STW and figure 12 indicates the part of employees on STW among employees in the private sector. For both figures, we separate the two types of STW identified with the FLFS: STW with no work during the reference week and STW with working time reduction during the reference week. In 2009q2, 240 000 employees in the private sector declare being on STWA during the reference week. 180 000 of them declare being on STWA by reducing their working time duration during the reference week and the rest of 60 000 employees completely stopped their activity during the reference week for reason of STWA. In 2009q2, nearly 1.4% of employees on the private sector declared themselves on STW. 2009q2 represents the highest peak in the STW declaration over the period 2003-2010.

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executives). For the second authorization, 2 employees were concerned (2 blue-collar workers). For this establishment *STW_empl_avg* equals 6 = (10+2)/2 and *STW_empl_max* equals max(6,2)+max(2)+max(2)=10.

Figure 11: The evolution of the number of employees in the private sector declaring themselves on STWA between 2003 and 2010
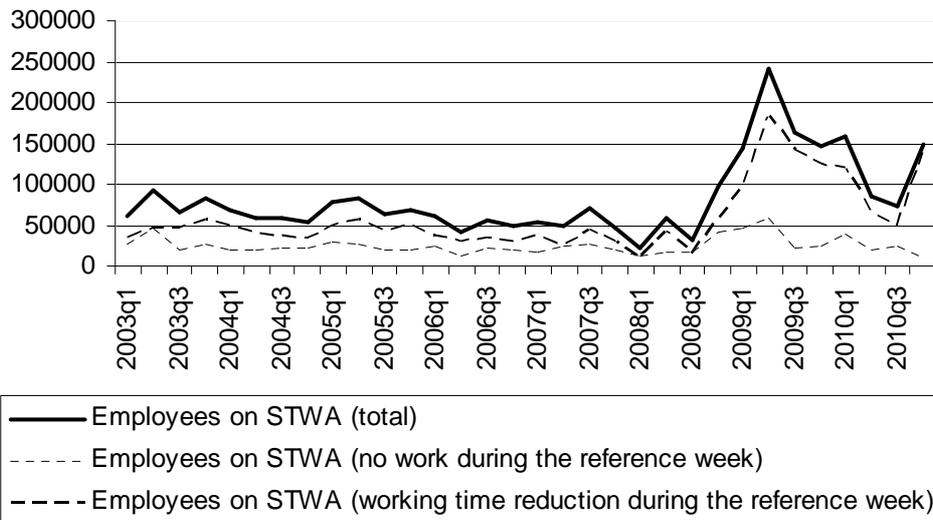
Source : French Labour Force Survey (2003q1-2010q4).
Field: Employees in the private sector declaring themselves on STWA. Data are weighted and seasonally adjusted.
Lecture: In 2009q2, 240 000 employees in the private sector declare being on STWA during the reference week.

Figure 12: Evolution of the part of employees declaring themselves on STW among employees in the private between 2003 and 2010
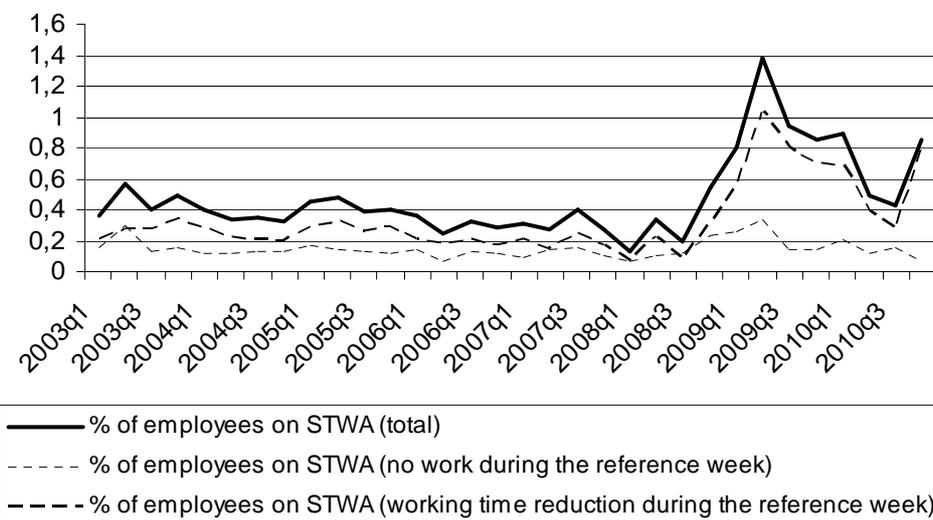
Source : French Labour Force Survey (2003q1-2010q4).
Field: Employees in the private sector declaring themselves on STWA. Data are weighted and seasonally adjusted.
Lecture: In 2009q2, 1,4% of employees in the private sector declare being on STWA during the reference week.

Table 2: The distribution of employees' characteristics if they declare themselves on STW or not in 2009 (%)

	All employees	On STW	On STW (no work during the reference week)	On STW (working time reduction the reference week)
Men	54.3	75.5	72.9	76.4
Living in couple	70.1	75.1	70.7	76.6
Children less than 3 years old present in the household	10.2	11.5	10.3	11.9
Age				
15-29	22.7	18.1	20.4	17.2
30-49	53.8	54.8	55.3	54.7
50 and more	23.6	27.1	24.2	28.1
Place of residence				
"Ile-de-France" region	20.9	8.1	10.0	7.5
"Centre North" region	17.1	25.0	25.2	24.9
"Nord-Pas-de-Calais" region	5.7	7.5	7.6	7.5
"East" region	9.0	16.6	14.8	17.1
"North-West Atlantic" region	13.6	13.3	16.6	12.2
"South West" region	10.4	8.6	9.4	8.3
"Centre South" region	12.6	15.1	12.1	16.1
"Midi Mediterranean" region	10.7	5.9	4.4	6.4
Living in a ZUS (urban regeneration area)	4.5	3.7	6.6	2.7
Occupational category				
Executive, knowledge worker	15.9	7.6	11.1	6.4
Intermediate profession	24.0	19.0	14.4	20.5
White-collar worker	30.7	8.7	6.9	9.3
Blue-collar worker	29.4	64.7	67.6	63.8
Diploma				
Without any diploma	14.0	19.2	19.3	19.1
At maximum the French A-level	57.0	65.2	65.9	64.9
More than the French A-level	29.0	15.7	14.7	16.0
Labour contract				
Permanent contract	87.7	87.9	79.9	90.6
Fixed-term contract	7.1	6.1	13.5	3.6
Temporary work	2.4	4.1	5.6	3.6
Other contracts (apprenticeship contract, seasonal contract)	2.8	1.9	1.0	1.2
Firm seniority				
Less than 1 year	12.3	8.9	15.0	6.8
Between 1 and 5 years	30.0	21.3	19.0	22.1
At least 5 years	57.7	69.8	66.0	71.1
Training during the last 3 months (=yes)	9.5	11.4	8.1	12.5
Full-time job	82.3	89.1	86.4	89.4
Evening work (8 p.m. till midnight)	29.4	37.0	41.7	35.4
Night work (midnight till 5 a.m.)	13.9	22.1	24.7	21.2
Compressed Work Schedule	13.2	20.5	17.9	21.4
Sector				
Agriculture	1.4	2.3	0.9	2.7

Industry	20.2	63.5	59.5	64.9
Construction	8.0	10.2	8.5	10.8
Tertiary sector	70.4	24.0	31.1	21.6
Establishment size				
Less than 20 employees	36.6	19.7	18.7	20.0
Between 20 and 49 employees	17.9	13.1	11.5	13.6
Between 50 and 499 employees	21.1	20.9	19.4	21.5
At least 500 employees	24.4	46.3	50.4	44.9
Salary				
Less than 1000 Euros	17.1	9.1	13.2	7.9
Between 1000 and 1500 Euros	33.3	43.3	47.9	41.9
Between 1500 and 2000 Euros	23.8	31.0	28.4	31.8
More than 2000 Euros	25.8	16.6	10.5	18.4
N°observations	113 183	1 145	291	854

Source: French Labour Force Survey 2009.
Field: Employees in the private sector.

Table 2 describes the distribution of employees' characteristics whether they declare being on STW or not during the week of reference. We recall that we calculate the descriptive statistics on the year 2009 by pilling up the 4 quarters[21]. The second column presents the distribution of individual characteristics on the global sample of employees in the private sector in the FLFS in 2009. We work with a global sample of 110 000 observations in 2009. The third column describes the distribution of individual characteristics on the subsample of employees in the private sector declaring themselves on STW. As STW is quite marginal, our subsample of employees declaring themselves on STW contains 1 100 observations in 2009. The forth and the fifths columns describe the distributions on subsamples of individuals declaring themselves on STW in function of the type of STW: column 4 concerns almost 300 employees in the private sector who declare not working during the week of reference for reason of STW; and column 5 contains 850 employees from the private sector who declare having reduced their working time during the week of reference for reason of STW. Table 3 presents the results of a logit model in which we explain the probability for an employee to declare himself/herself on STW vs. not declaring himself/herself on STW[22]. For this estimation, we use almost all the characteristics from table 2[23]. This permits us an analysis "ceteris paribus" that completes and validates the descriptive statistics from table 2.

Men are overrepresented in the group of employees declaring themselves on STW: 76% of employees declaring themselves on STW are men versus 54% of individuals on the global sample. This result is confirmed by the results of table 3 as the coefficient of the variable "men" is positive and highly significant (at 1%). Additionally, the percentage of men among employees declaring having reduced their working time for STW is slightly superior (76%) to the percentage of men among employees who declare not working during the week of reference for reason of STW (73%).

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[21] A same individual may appear several times in our sample.

[22] Appendix 8 presents the results of a multinomial logit. The modality of reference is "not declaring himself/herself on STW". This complementary analysis permits to see separetely the differences of determinants between individuals declaring themselves on STW without working during the reference week and those declaring themselves on STW by reducing their working time during the week of reference. Attention must be paid to the interpretation of these results as the number of employees declaring themselves on STW without any work during the week of reference is not very high (250 individuals) versus 90 000 individuals who declare not being on STW during the week of reference.

[23] We did not use the variables of firm seniority and employee's salary as we would have lost too much observations.

70% of employees working in the private sector in 2009 are living in couple. This characteristic is slightly overrepresented in the subsample of employees declaring themselves on STW (75%); ceteris paribus, living in couple increases the probability of declaring being on STW during the week of reference (table 3). On the contrary, there is no significant difference between the global sample and the STW subsample in terms of having at least one child less than 3 years old. This result is confirmed by the estimate in table 3.

Young employees (15 to 29 years old) are underrepresented among people declaring themselves on STW (18% vs. 23% for the global sample), and this result is even more marked for employees declaring having reduced their working time for STW (17%). On the other hand, people at least 50 years old are overrepresented among employees declaring themselves on STW (24% for the global population and 27% for the population on STW). This last result is confirmed by the Logit model (see table 3).

Regarding the place of residence, we notice that the regions "Ile-de-France" and "Midi Mediterranean" are underrepresented among STW employees: 8% resp. 6% of STW employees are in the "Ile-de-France" region resp. "Midi Mediterranean" vs. 21% resp. 11% for all employees. On the contrary, the fact of living in the regions "Centre North" and "East" is overrepresented among STW employees in the private sector: 25% resp. 17% of STW employees are in the "Centre North" region resp. "East" region vs. 17% resp. 9% for all employees. Table 3 also emphasizes some regional differences in the declaration of being on STW. The "Ile-de-France" region is the reference. We observe that living in all the other regions excepting for the "Midi Mediterranean" region increases the probability of declaring being on STW. Related to the geographical location, we wanted to check if the fact that living in an urban regeneration area (ZUS) has a positive or negative correlation on the fact of being on STW. It seems that employees on STW have almost the same distribution with regards to this indicator as the global population. In the Logit model, we observe that there is no significant correlation between the fact of living in a ZUS and the probability for an employee of declaring himself/herself on STW.

Related to the occupational category, table 2 confirms the results obtained using establishment authorization data (section 5.2): 65% of employees declaring themselves on STW are blue-collar workers vs. 29% for the global population. The proportion is even higher for the employees on STW who do not work during the week of reference (68%). This result is confirmed ceteris paribus in table 3, where, for an employee, the highest probability to declare himself/herself on STW is to be a blue-collar worker. As for executives and knowledge workers, they are underrepresented among STW employees (8% vs. 16% on the global sample). Employees in the intermediate professions and white-collar workers are also strongly underrepresented among STW workers. The occupational category which seems the most underrepresented is the category "white-collar workers": 9% of STW employees are white-collar workers vs. 31% on the global sample.

In Table 2, the level of the diploma seems as well to be an important characteristic in explaining employees' declaration of being on STW. High-educated people (more than the French A-level – Baccalauréat) seem to be underrepresented among STW employees: 16% of employees on STW have a diploma more than the French A-level against 29% for the global sample. Ceteris paribus, this result is not confirmed by the Logit model. The reference in the logit model is "without any diploma" and it seems that the level of the diploma is not correlated with the probability of declaring himself/herself on STW.

There are no strong differences between the global sample and the subsample of STW employees in terms of labour contract. Nevertheless, fixed-term contracts are overrepresented for STW employees declaring not working during the week of reference: 14% for this category against 7% for the global population. Table 2 also indicates that STW employees have in majority a permanent contract (88% of STW employees). In 2009, 4% of employees in the private sector declaring themselves on STW are on temporary work. In table 3, we retained the modality "permanent contract" as a reference. We observe that, ceteris paribus, employees with fixed-term contracts and with temporary work have a higher probability of declaring themselves on STW. Interestingly, the strongest probability is for the "temporary work" modality.

Full-time jobs are overrepresented on the STW subsample: 89% of employees declaring themselves on STW have a full-time job vs. 82% for the global sample. The logit model shows on the contrary that having a full-time job is negatively correlated with the probability of declaring himself/herself on STW ceteris paribus.

STW seems to be a scheme that concerns more people with an important seniority inside the firm. We can imagine that firms that use STW put in priority their valuable employees on STW, the ones with the highest experience in the firm. So, we remark that employees with at least 5 years of seniority inside the firm are overrepresented among STW employees: 70% of employees in the private sector declaring themselves on STW have at least 5 years of seniority inside the firm vs. 58% for the global sample of employees.

Training during the last 3 months is slightly overrepresented on the STW subsample: 11.4% of employees declaring themselves on STW had a training during the last 3 months vs. 9.5% for the global sample. The percentage is even more important for the subsample of employees on STW declaring having reduced their working time during the reference week (12.5%). This result is confirmed in table 3 by the results of the logit model.

Evening work, night work and compressed work schedule are overrepresented among STW employees: 37% resp. 22% resp. 21% of STW employees have an evening work resp. work at night resp. work in firms with compressed work schedule vs. 29% resp. 14% resp. 13% for employees on the global population. Only the result on the compressed work schedule variable is confirmed in table 3: working in a firm that uses compressed work schedule increases the probability for an employee of declaring himself/herself on STW.

Regarding the sectoral and establishment size distributions, we find the main results of the section 5.2. Industry employees are largely overrepresented among STW employees: 64% of the employees declaring themselves on STW are in the industry vs. 20% for the global sample. On the contrary, the tertiary sector is strongly underrepresented: 24% of the employees declaring themselves on STW are in the tertiary sector vs. 70% for the global sample. These results are confirmed in table 3.

Employees in small establishments (with less than 20 employees) are underrepresented on the subsample of employees on STW: 20% of employees declaring being on STW are working in an establishment with less than 20 employees against 37% for the employees on the global sample. As for employees working in big establishments (with at least 500 employees), they are overrepresented among STW employees: 46% of STW employees work in establishments with at least 500 employees vs. 24% for the employees on the global

sample. These results are confirmed in table 3. More the size of the establishment is important, more important the probability for an employee of declaring himself/herself on STW is.

And finally, concerning the salary variable[24], we note that employees with salaries less than 1 000 Euros and more than 2 000 Euros (extreme values) are underrepresented among STW employees: 9.1% resp. 17% of STW employees earn less than 1 000 Euros resp. more than 2000 Euros vs. 17% resp. 26% for the employees on the global sample. On the contrary, the two remaining modalities of salary (between 1 000 and 2 000 Euros) are overrepresented among STW employees: 43% resp. 31% of STW employees earn between 1 000 and 1 500 Euros resp. between 1 500 and 2000 Euros vs. 33% resp. 24% for the employees on the global sample.

Table 3: The probability for an employee of being on STW (Logit model)

	Estimate	Standard error
Intercept	-3.75 ***	0.23
Men	0.36 ***	0.09
Living in couple	0.15 *	0.08
Children less than 3 years old present in the household	0.17 n.s.	0.11
Age		
15-29	Ref.	
30-49	0.11 n.s.	0.10
50 and more	0.21 *	
Place of residence		
"Ile-de-France" region	Ref.	
"Centre North" region	0.75 ***	0.14
"Nord-Pas-de-Calais" region	0.63 ***	0.17
"East" region	0.89 ***	0.15
"North-West Atlantic" region	0.32 **	0.16
"South West" region	0.31 *	0.18
"Centre South" region	0.83 ***	0.15
"Midi Mediterranean" region	0.11 n.s.	0.20
Living in a ZUS (urban regeneration area)	-0.15 n.s.	0.16
Occupational category		
Executive, knowledge worker	-1.09 ***	0.15
Intermediate profession	-0.63 ***	0.09
White-collar worker	-1.04 ***	0.15
Blue-collar worker	Ref.	
Diploma		
Without any diploma	Ref.	
At maximum the French A-level	-0.01 n.s.	0.09
More than the French A-level	-0.03 n.s.	0.13
Labour contract		
Permanent contract	Ref.	
Fixed-term contract	0.43 ***	0.16
Temporary work	1.31 ***	0.21
Other contracts (apprenticeship	-0.45 n.s.	0.31

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[24] For the construction of this variable, we do not control for the fact that employees are full-time or part-time workers.

contract, seasonal contract)

Training during the last 3 months (=yes)	0.23 **	0.10
Full-time job	-0.27 **	0.13
Evening work (8 p.m. till midnight)	0.11 n.s.	0.08
Night work (midnight till 5 a.m.)	-0.14 n.s.	0.10
Compressed Work Schedule	0.22 ***	0.08
Sector		
Agriculture	-0.56 **	0.25
Industry	Ref.	
Construction	-0.87 ***	0.12
Tertiary sector	-1.82 ***	0.10
Establishment size		
Less than 20 employees	-0.68 ***	0.10
Between 20 and 49 employees	-0.56 ***	0.11
Between 50 and 499 employees	-0.32 ***	0.08
At least 500 employees	Ref.	
Max-rescaled R-Square	0.14	
N°observations	91 067	
N°employees on STWA	1 002	
N°employees not on STWA	90 697	

Source: French Labour Force Survey 2009.
Field: Employees in the private sector.
n.s. indicates statistical non significant at the 10% level
* indicates statistical significance at the 10% level.
** indicates statistical significance at the 5% level.
*** indicates statistical significance at the 1% level.

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Appendix 1: Number of individuals declaring themselves on STW

	Individuals in employment declaring themselves on STW	Employees in the public sector declaring themselves on STW	Unwaged individuals declaring themselves on STW	Employees in the private sector declaring themselves on STW	% Employees in the public sector	% Unwaged individuals	% Employees in the private sector
2003Q1	244	11	90	143	5%	37%	59%
2003Q2	103	4	22	77	4%	21%	75%
2003Q3	99	6	29	63	6%	29%	64%
2003Q4	200	20	74	106	10%	37%	53%
2004Q1	214	9	72	133	4%	34%	62%
2004Q2	89	0	35	54	0%	39%	61%
2004Q3	94	8	32	54	9%	34%	57%
2004Q4	132	4	45	81	3%	34%	61%
2005Q1	275	11	89	171	4%	32%	62%
2005Q2	113	9	27	77	8%	24%	68%
2005Q3	90	7	19	63	8%	21%	70%
2005Q4	146	7	51	88	5%	35%	60%
2006Q1	222	9	83	129	4%	37%	58%
2006Q2	65	3	22	40	5%	34%	62%
2006Q3	95	7	33	54	7%	35%	57%
2006Q4	118	4	36	77	3%	31%	65%
2007Q1	200	10	68	122	5%	34%	61%
2007Q2	105	1	51	53	1%	49%	50%
2007Q3	97	6	27	64	6%	28%	66%
2007Q4	90	5	22	63	6%	24%	70%
2008Q1	90	3	32	55	3%	36%	61%
2008Q2	118	1	61	56	1%	52%	47%
2008Q3	52	8	15	29	15%	29%	56%
2008Q4	200	5	48	147	3%	24%	74%
2009Q1	485	14	93	378	3%	19%	78%
2009Q2	353	3	31	319	1%	9%	90%
2009Q3	186	6	19	161	3%	10%	87%
2009Q4	369	19	61	287	5%	17%	78%
2010Q1	704	44	193	467	6%	27%	66%
2010Q2	207	5	57	145	2%	28%	70%
2010Q3	114	7	31	76	6%	27%	67%
2010Q4	485	41	135	306	8%	28%	63%

Source: French Labour Force Survey, Insee.

Observations: The sum of employees in the private sector, unwaged individuals and employees in the public sector is not always equal to the number of individuals in employment. This is due to the fact that for some individuals, the information necessary to determine whether the individual works in the private or in the public sector is missing.

This table presents the number of different categories of individuals (individuals in employment, employees in the public sector, employees in the private sector, unwaged individuals[25]) declaring themselves on STW. We remark that, on average, between 2003q1 and 2010q4 almost 5% of the individuals in employment declaring themselves on STW work in the public sector. Additionally, we observe that almost a third of the individuals declaring themselves on STW are unwaged. Legally, these two categories of individuals can not benefit from the STW compensation. For this reason, for our analysis, we decide to retain only the employees in the private sector declaring themselves on STW.

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[25] Self-employed workers, etc.

Appendix 2: The evolution of STW authorized specific allocation between 2007 and 2010
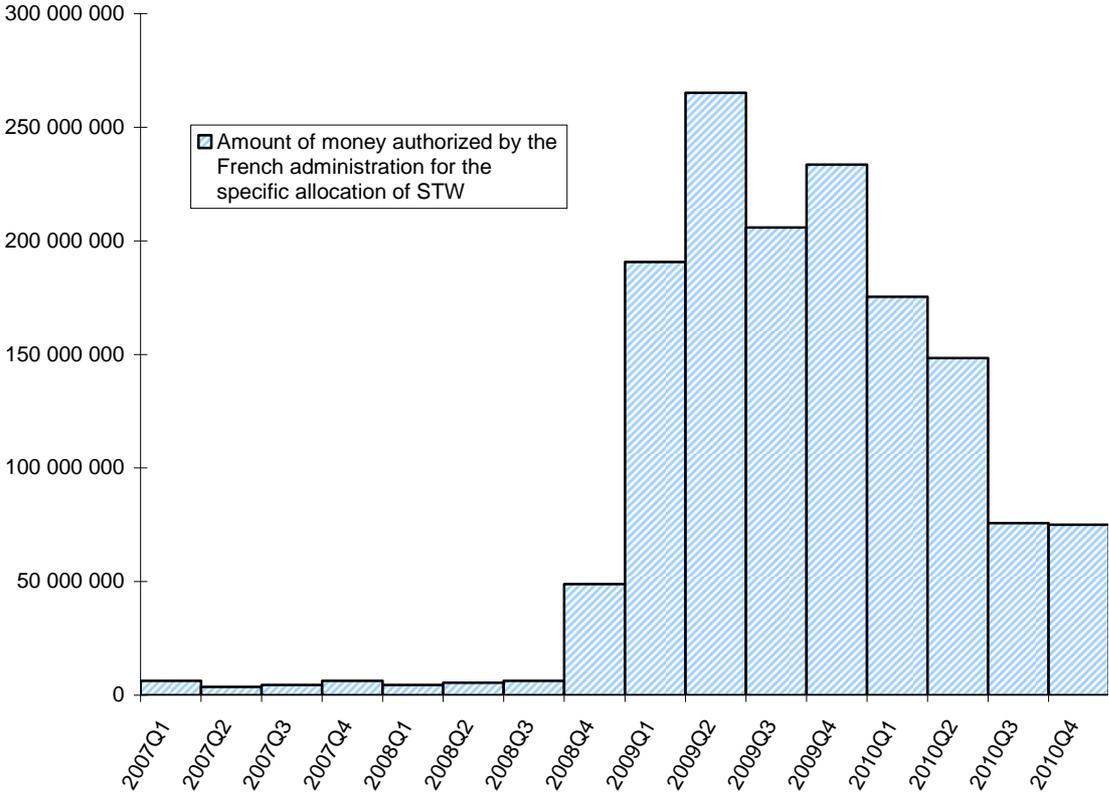
Source: STW authorization databases. DGEFP.
Field: Establishments in France (all sizes, all sectors).

Appendix 3: The evolution of STW authorized hours by sector between 2007 and 2010

	Total number of authorized hours of STW	Agriculture, forestry and fishing	Industry	Construction	Services sector (mainly commercial)	Citizen services sector
2007Q1	2 702 599	43 053	1 690 342	115 299	759 598	81 427
2007Q2	1 564 610	46 288	1 165 554	69 511	241 451	30 464
2007Q3	1 365 187	284 299	696 491	36 737	291 939	49 654
2007Q4	2 399 787	200 763	1 833 903	48 935	268 256	45 667
2008Q1	1 829 671	108 646	1 304 229	87 407	262 418	60 220
2008Q2	2 343 416	48 718	1 905 097	81 105	265 704	37 288
2008Q3	2 583 612	148 496	2 018 082	74 962	300 736	34 584
2008Q4	21 625 709	58 499	19 734 551	333 731	1 099 870	378 636
2009Q1	60 061 641	172 152	49 912 673	1 868 615	6 695 117	1 357 940
2009Q2	75 492 454	122 595	63 663 169	1 955 775	7 998 541	1 676 829
2009Q3	57 332 803	101 283	47 526 941	1 411 083	6 952 352	1 324 160
2009Q4	64 969 618	97 730	54 425 320	1 846 411	7 232 736	1 362 988
2010Q1	48 272 923	206 421	38 436 911	2 725 625	5 625 269	1 278 208
2010Q2	40 967 232	384 174	32 648 699	2 354 251	4 278 417	1 301 196
2010Q3	20 830 854	87 152	16 488 004	1 213 288	2 336 768	705 642
2010Q4	20 644 953	85 296	16 364 584	1 398 741	2 208 450	587 602
Part in the total number of authorized hours of STW (%)						
2007Q1	100,0%	1,6%	62,5%	4,3%	28,1%	3,0%
2007Q2	100,0%	3,0%	74,5%	4,4%	15,4%	1,9%
2007Q3	100,0%	20,8%	51,0%	2,7%	21,4%	3,6%
2007Q4	100,0%	8,4%	76,4%	2,0%	11,2%	1,9%
2008Q1	100,0%	5,9%	71,3%	4,8%	14,3%	3,3%
2008Q2	100,0%	2,1%	81,3%	3,5%	11,3%	1,6%
2008Q3	100,0%	5,7%	78,1%	2,9%	11,6%	1,3%
2008Q4	100,0%	0,3%	91,3%	1,5%	5,1%	1,8%
2009Q1	100,0%	0,3%	83,1%	3,1%	11,1%	2,3%
2009Q2	100,0%	0,2%	84,3%	2,6%	10,6%	2,2%
2009Q3	100,0%	0,2%	82,9%	2,5%	12,1%	2,3%
2009Q4	100,0%	0,2%	83,8%	2,8%	11,1%	2,1%
2010Q1	100,0%	0,4%	79,6%	5,6%	11,7%	2,6%
2010Q2	100,0%	0,9%	79,7%	5,7%	10,4%	3,2%
2010Q3	100,0%	0,4%	79,2%	5,8%	11,2%	3,4%
2010Q4	100,0%	0,4%	79,3%	6,8%	10,7%	2,8%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Appendix 4: The evolution of STW authorized hours within industry sectors between 2007 and 2010

	Total number of authorized hours of STW	Textile and apparel industry	Manufacturing industry	Metalworking industry	Machinery and equipment industry	Car industry	Other industries
2007Q1	1 690 342	397 720	533 758	31 794	41 700	421 107	264 263
2007Q2	1 165 554	281 968	300 150	46 218	49 815	241 208	246 195
2007Q3	696 491	188 399	125 586	28 567	15 071	114 657	224 211
2007Q4	1 833 903	354 701	391 923	70 592	65 383	715 008	236 296
2008Q1	1 304 229	349 962	319 187	13 212	47 182	363 925	210 761
2008Q2	1 905 097	364 770	357 284	26 957	117 885	623 150	415 051
2008Q3	2 018 082	347 498	324 435	35 358	132 861	764 757	413 173
2008Q4	19 734 551	877 141	5 419 004	1 092 489	1 287 794	9 238 790	1 819 333
2009Q1	49 912 673	2 071 693	15 652 261	3 713 626	5 142 176	16 533 190	6 799 727
2009Q2	63 663 169	3 024 358	21 306 603	6 520 663	8 788 982	12 735 303	11 287 260
2009Q3	47 526 941	2 293 114	16 149 314	5 143 397	7 523 985	7 095 780	9 321 351
2009Q4	54 425 320	2 246 083	17 756 038	5 430 350	8 566 993	9 993 760	10 432 096
2010Q1	38 436 911	1 756 083	12 075 565	3 658 292	5 833 003	7 013 672	8 100 296
2010Q2	32 648 699	1 422 432	9 599 995	2 941 318	4 718 111	7 018 833	6 948 010
2010Q3	16 488 004	713 511	4 427 844	1 851 133	2 288 175	3 581 240	3 626 101
2010Q4	16 364 584	742 181	3 910 365	1 727 534	2 225 315	4 088 394	3 670 795
Part in the total number of authorized hours of STW in the industry sector (%)							
2007Q1	100,0%	23,5%	31,6%	1,9%	2,5%	24,9%	15,6%
2007Q2	100,0%	24,2%	25,8%	4,0%	4,3%	20,7%	21,1%
2007Q3	100,0%	27,0%	18,0%	4,1%	2,2%	16,5%	32,2%
2007Q4	100,0%	19,3%	21,4%	3,8%	3,6%	39,0%	12,9%
2008Q1	100,0%	26,8%	24,5%	1,0%	3,6%	27,9%	16,2%
2008Q2	100,0%	19,1%	18,8%	1,4%	6,2%	32,7%	21,8%
2008Q3	100,0%	17,2%	16,1%	1,8%	6,6%	37,9%	20,5%
2008Q4	100,0%	4,4%	27,5%	5,5%	6,5%	46,8%	9,2%
2009Q1	100,0%	4,2%	31,4%	7,4%	10,3%	33,1%	13,6%
2009Q2	100,0%	4,8%	33,5%	10,2%	13,8%	20,0%	17,7%
2009Q3	100,0%	4,8%	34,0%	10,8%	15,8%	14,9%	19,6%
2009Q4	100,0%	4,1%	32,6%	10,0%	15,7%	18,4%	19,2%
2010Q1	100,0%	4,6%	31,4%	9,5%	15,2%	18,2%	21,1%
2010Q2	100,0%	4,4%	29,4%	9,0%	14,5%	21,5%	21,3%
2010Q3	100,0%	4,3%	26,9%	11,2%	13,9%	21,7%	22,0%
2010Q4	100,0%	4,5%	23,9%	10,6%	13,6%	25,0%	22,4%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Appendix 5: The evolution of STW authorized hours by establishment size between 2007 and 2010

	Total number of authorized hours of STW	Less than 20 employees	From 20 to less than 50 employees	From 50 to less than 250 employees	At least 250 employees
2007Q1	2 702 599	643 037	442 828	921 975	694 759
2007Q2	1 564 610	447 815	291 239	510 331	315 225
2007Q3	1 365 187	393 738	346 238	430 188	195 023
2007Q4	2 399 787	443 265	420 806	750 848	784 868
2008Q1	1 829 671	474 407	403 659	482 243	469 362
2008Q2	2 343 416	449 509	398 612	569 202	926 093
2008Q3	2 583 612	371 937	423 429	673 145	1 115 101
2008Q4	21 625 709	1 282 057	1 800 975	4 999 507	13 543 170
2009Q1	60 061 641	6 326 096	7 060 191	18 330 319	28 345 035
2009Q2	75 492 454	8 368 903	11 078 409	25 360 377	30 684 765
2009Q3	57 332 803	7 303 275	9 377 009	20 267 969	20 384 550
2009Q4	64 969 618	8 238 110	10 323 470	22 232 263	24 175 775
2010Q1	48 272 923	7 828 897	8 388 861	16 482 725	15 572 440
2010Q2	40 967 232	6 807 670	6 793 979	13 623 517	13 742 066
2010Q3	20 830 854	3 595 244	3 568 881	7 253 028	6 413 701
2010Q4	20 644 953	3 201 086	3 482 743	7 560 862	6 400 262
Part in the total number of authorized hours of STW (%)					
2007Q1	100,0%	23,8%	16,4%	34,1%	25,7%
2007Q2	100,0%	28,6%	18,6%	32,6%	20,1%
2007Q3	100,0%	28,8%	25,4%	31,5%	14,3%
2007Q4	100,0%	18,5%	17,5%	31,3%	32,7%
2008Q1	100,0%	25,9%	22,1%	26,4%	25,7%
2008Q2	100,0%	19,2%	17,0%	24,3%	39,5%
2008Q3	100,0%	14,4%	16,4%	26,1%	43,2%
2008Q4	100,0%	5,9%	8,3%	23,1%	62,6%
2009Q1	100,0%	10,5%	11,8%	30,5%	47,2%
2009Q2	100,0%	11,1%	14,7%	33,6%	40,6%
2009Q3	100,0%	12,7%	16,4%	35,4%	35,6%
2009Q4	100,0%	12,7%	15,9%	34,2%	37,2%
2010Q1	100,0%	16,2%	17,4%	34,1%	32,3%
2010Q2	100,0%	16,6%	16,6%	33,3%	33,5%
2010Q3	100,0%	17,3%	17,1%	34,8%	30,8%
2010Q4	100,0%	15,5%	16,9%	36,6%	31,0%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Appendix 6: The evolution of STW authorized hours by reason of using STW between 2007 and 2010

	Total number of authorized hours of STW	Downturns in the economic cycle	Difficulties in the acquisition of raw materials or energy	Disasters	Exceptional bad weather	Transformation, restructuring or modernization	Other types of exceptional difficulties
2007Q1	2 702 599	1912372	86945	87769	176742	147027	291744
2007Q2	1 564 610	1249705	109010	69723	29130	33049	73993
2007Q3	1 365 187	738722	12626	96544	338388	56513	122394
2007Q4	2 399 787	1897789	56294	68858	199592	59477	117777
2008Q1	1 829 671	1428987	28423	100793	89909	79801	101758
2008Q2	2 343 416	1904640	189766	78358	12236	32198	126218
2008Q3	2 583 612	2000475	138168	102359	199633	69221	73756
2008Q4	21 625 709	21025095	32996	295201	46790	63946	161681
2009Q1	60 061 641	57924887	1253290	199715	177454	81138	425157
2009Q2	75 492 454	74891627	166771	102079	12282	58137	261558
2009Q3	57 332 803	57075135	55316	99921	7669	23609	71153
2009Q4	64 969 618	64610617	37811	100367	37996	53188	129639
2010Q1	48 272 923	47551951	22621	166133	296983	109677	125558
2010Q2	40 967 232	39849942	43783	187064	593926	46481	246036
2010Q3	20 830 854	20222967	105117	121964	266421	26964	87421
2010Q4	20 644 953	19755964	325229	109958	142526	192178	119098
Part in the total number of authorized hours of STW (%)							
2007Q1	100,0%	70,8%	3,2%	3,2%	6,5%	5,4%	10,8%
2007Q2	100,0%	79,9%	7,0%	4,5%	1,9%	2,1%	4,7%
2007Q3	100,0%	54,1%	0,9%	7,1%	24,8%	4,1%	9,0%
2007Q4	100,0%	79,1%	2,3%	2,9%	8,3%	2,5%	4,9%
2008Q1	100,0%	78,1%	1,6%	5,5%	4,9%	4,4%	5,6%
2008Q2	100,0%	81,3%	8,1%	3,3%	0,5%	1,4%	5,4%
2008Q3	100,0%	77,4%	5,3%	4,0%	7,7%	2,7%	2,9%
2008Q4	100,0%	97,2%	0,2%	1,4%	0,2%	0,3%	0,7%
2009Q1	100,0%	96,4%	2,1%	0,3%	0,3%	0,1%	0,7%
2009Q2	100,0%	99,2%	0,2%	0,1%	0,0%	0,1%	0,3%
2009Q3	100,0%	99,6%	0,1%	0,2%	0,0%	0,0%	0,1%
2009Q4	100,0%	99,4%	0,1%	0,2%	0,1%	0,1%	0,2%
2010Q1	100,0%	98,5%	0,0%	0,3%	0,6%	0,2%	0,3%
2010Q2	100,0%	97,3%	0,1%	0,5%	1,4%	0,1%	0,6%
2010Q3	100,0%	97,1%	0,5%	0,6%	1,3%	0,1%	0,4%
2010Q4	100,0%	95,7%	1,6%	0,5%	0,7%	0,9%	0,6%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Appendix 7: The evolution of STW authorized hours by perimeter of the STW recourse between 2007 and 2010

	Total number of authorized hours of STW	Whole establishment with working time reduction	A part of the establishment with working time reduction	Whole establishment with cessation of activity	A part of the establishment with cessation of activity
2007Q1	2 702 599	1 127 071	929 407	296 906	349 215
2007Q2	1 564 610	624 568	682 504	115 763	141 775
2007Q3	1 365 187	313 534	448 059	299 061	304 533
2007Q4	2 399 787	925 079	809 227	251 164	414 317
2008Q1	1 829 671	728 106	696 277	238 505	166 783
2008Q2	2 343 416	822 750	950 147	168 257	402 262
2008Q3	2 583 612	948 796	874 626	201 174	559 016
2008Q4	21 625 709	9 143 703	6 974 586	1 353 636	4 153 784
2009Q1	60 061 641	27 635 504	25 004 354	4 459 056	2 962 727
2009Q2	75 492 454	37 417 762	34 318 947	2 151 547	1 604 198
2009Q3	57 332 803	31 767 979	23 516 645	916 978	1 131 201
2009Q4	64 969 618	36 064 616	27 108 398	701 295	1 095 309
2010Q1	48 272 923	25 441 311	20 757 870	782 299	1 291 443
2010Q2	40 967 232	21 829 697	17 239 775	792 364	1 105 396
2010Q3	20 830 854	11 046 602	9 027 867	424 339	332 046
2010Q4	20 644 953	10 470 903	9 148 298	674 468	351 284
Part in the total number of authorized hours of STW (%)					
2007Q1	100,0%	41,7%	34,4%	11,0%	12,9%
2007Q2	100,0%	39,9%	43,6%	7,4%	9,1%
2007Q3	100,0%	23,0%	32,8%	21,9%	22,3%
2007Q4	100,0%	38,5%	33,7%	10,5%	17,3%
2008Q1	100,0%	39,8%	38,1%	13,0%	9,1%
2008Q2	100,0%	35,1%	40,5%	7,2%	17,2%
2008Q3	100,0%	36,7%	33,9%	7,8%	21,6%
2008Q4	100,0%	42,3%	32,3%	6,3%	19,2%
2009Q1	100,0%	46,0%	41,6%	7,4%	4,9%
2009Q2	100,0%	49,6%	45,5%	2,9%	2,1%
2009Q3	100,0%	55,4%	41,0%	1,6%	2,0%
2009Q4	100,0%	55,5%	41,7%	1,1%	1,7%
2010Q1	100,0%	52,7%	43,0%	1,6%	2,7%
2010Q2	100,0%	53,3%	42,1%	1,9%	2,7%
2010Q3	100,0%	53,0%	43,3%	2,0%	1,6%
2010Q4	100,0%	50,7%	44,3%	3,3%	1,7%

Source: STW authorization data bases. DGEFP
Field: Establishments in France (all sizes, all sectors).

Appendix 8: The estimates of a multinomial logit (the probability of being on STW without working during the reference week vs. not being on STW and the probability of being on STW with working time reduction during the reference week vs. not being on STW)

	STW - No work during the reference week		STW – working time reduction during the reference week	
	Estimate	**Standard error**	**Estimate**	**Standard error**
Intercept	-4.68 ***	0.43	-4.25 ***	0.28
Men	0.39 **	0.17	0.35 ***	0.10
Living in couple	0.03 n.s.	0.15	0.19 **	0.10
Children less than 3 years old present in the household	-0.09 n.s.	0.23	0.24 **	0.12
Age				
15-29	Ref.		Ref.	
30-49	0.13 n.s.	0.19	0.09 n.s.	0.12
50 and more	0.08 n.s.	0.22	0.24 *	0.13
Place of residence				
"Ile-de-France" region	Ref.		Ref.	
"Centre North" region	0.86 ***	0.27	0.71 ***	0.17
"Nord-Pas-de-Calais" region	0.56 *	0.33	0.65 ***	0.20
"East" region	0.73 **	0.30	0.94 ***	0.18
"North-West Atlantic" region	0.59 **	0.30	0.21 n.s.	0.19
"South West" region	0.30 n.s.	0.35	0.32 n.s.	0.21
"Centre South" region	0.67 **	0.30	0.88 ***	0.18
"Midi Mediterranean" region	-0.17 n.s.	0.43	0.19 n.s.	0.23
Living in a ZUS (urban regeneration area)	0.42 *	0.24	-0.48 **	0.22
Occupational category				
Executive. knowledge worker	-0.77 ***	0.28	-1.21 ***	0.17
Intermediate profession	-0.78 ***	0.19	-0.60 ***	0.10
White-collar worker	-1.26 ***	0.28	-0.95 ***	0.17
Blue-collar worker	Ref.		Ref.	
Diploma				
Without any diploma	Ref.		Ref.	
At maximum the French A-level	-0.08 n.s.	0.17	0.02 n.s.	0.10
More than the French A-level	-0.33 n.s.	0.27	0.07 n.s.	0.15
Labour contract				
Permanent contract	Ref.		Ref.	
Fixed-term contract	1.35 ***	0.21	-0.27 n.s.	0.25
Temporary work	1.38 ***	0.34	1.26 ***	0.26
Other contracts (apprenticeship contract, seasonal contract)	-0.05 n.s.	0.53	-0.60 n.s.	0.37
Training during the last 3 months (=yes)	-0.07 n.s.	0.22	0.32 ***	0.11
Full-time job	-0.63 ***	0.22	-0.10 n.s.	0.16
Evening work (8 p.m. till midnight)	0.24 n.s.	0.16	0.06 n.s.	0.10
Night work (midnight till 5 a.m.)	-0.10 n.s.	0.18	-0.16 n.s.	0.11
Compressed Work Schedule	0.18 n.s.	0.16	0.22 **	0.09
Sector				
Agriculture	-1.02 *	0.60	-0.43 n.s.	0.27
Industry	Ref.		Ref.	
Construction	-0.78 ***	0.25	-0.89 ***	0.14
Tertiary sector	-1.37 ***	0.18	-1.99 ***	0.11

Establishment size				
Less than 20 employees	-0.96 ***	0.20	-0.58 ***	0.12
Between 20 and 49 employees	-0.99 ***	0.23	-0.42 ***	0.12
Between 50 and 499 employees	-0.54 ***	0.17	-0.25 **	0.10
At least 500 employees	Ref.		Ref.	
N°observations			91 699	
N°employees on STWA – no work during the reference week			253	
N°employees on STWA – working time reduction during the reference week			749	
N°employees not on STWA			90 697	

Source: French Labour Force Survey 2009.
Field: Employees in the private sector.
n.s. indicates statistical non significant at the 10% level
* indicates statistical significance at the 10% level.
** indicates statistical significance at the 5% level.
*** indicates statistical significance at the 1% level.