Wages, Labor Costs, Taxes and Technological Determinants of Inequalities: France 1976-2010[1]

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Abstract:

This paper makes two simple points. First, labor demand depends on labor cost. Hence, demand-side explanations for the rise in inequalities such as skill biased technical change and job polarization should be tested using data on labor cost. When we do so for France, we find some evidence of skill biased technical change in France, as in every other developed country, and in contrast with previous studies that used net or gross wages. Second, providing that payroll taxes and social security reforms are entirely passed on to workers in the long run, they are an effective institutional tool to reduce wage inequalities. This is clear in France, where net and gross wage inequalities have remained roughly constant, while labor cost inequalities have actually increased by 25% during the past forty years. This sharp contrast between French wage and labor cost inequalities contribute to the general debate that opposes institutional factors and demand-side factors to explain the rise in inequalities.

Keywords: Wage inequalities, Labor cost inequalities, Social security contributions,

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Introduction

OECD statistics and a series of recent academic papers (Koubi et al, 2005; Charnoz, Coudin, and Gaini, 2011, 2013; Verdugo, 2014) show that France is almost the only developed country where overall wage inequalities have been decreasing over the past 40 years. For example, the ratio d9/d1 of wages at the 9th and 1st deciles of distribution of net wages decreased from about 3.6 in 1976 to slightly less than 3 in 2010. This decrease is mostly driven by a reduction in lower-tail net wage inequalities (d5/d1), while upper-tail inequalities (d9/d5) remained roughly constant over the period 1976-2010.

This "French exception" shed doubts on the main demand-side explanations for the rise in inequalities, such as skill biased technical change or job polarization. This is because those explanations derive from global technological changes that should have hit all developed countries. However, detailed studies of the French wage structure have concluded that they do not apply in France, where institutional factors are mainly responsible for the compression of the wage distribution (Goux and Maurin, 2000; Card et al, 1999; Charnoz et al, 2011).

This contrasts with other developed countries such as the U.S., the U.K. or Germany, where skill biased technical change has been clearly documented (e.g. Katz and Murply, 1992; Card and Lemieux, 2001 Autor et al, 2008 for the US; Lindley and Machin, 2011 for the UK; Dustman et al, 2009 for Germany), even if its effects have been sometimes mitigated by institutional factors such as the minimum wage (Card and DiNardo, 2002; Autor et al, 2008).

We recall in this paper that the relative demand for skilled and unskilled labor depends on their relative costs rather than their relative wages. The difference between the two is the social security contributions paid by firms, and sometimes employees as well, on every job. In the U.S. and the U.K., the relative weight represented by those contributions for skilled and unskilled workers has remained roughly similar, implying that using labor cost instead of wages would not affect much the analysis. However, the picture is very different in France, as it might also be in other countries.

In section 1, we show that labor cost inequalities have actually increased in France by more than 15%, while net and gross wage inequalities have decreased by about 5%. We describe the main reforms in the schedule of social security contributions that have led to this discrepancy between the two series.

Section 2 reproduces the standard analyses of skill biased technical change (à la Katz and Murphy, 1992 or Card and Lemieux, 2001) using labor costs per worker instead of gross or net wages. In contrast with previous studies, it concludes to the existence of some skill biased technical change in France.

In section 3, we come back to the debates opposing institutional and technological determinants of inequalities, and discuss the extent to which tax policy can be an effective tool to reduce inequalities. The French example suggests that social security reforms have been entirely passed on to workers in the long run. As a consequence, they have reduced wage inequalities. The joint role of the minimum wage is also discussed.

The analysis relies on a great deal of data and tax computations. To keep the paper short, we explain institutional details and subsequent data and methodological choices in two appendixes.

1. Wage and labor cost inequalities in French private sector: 1976-2010

To summarize the basic changes in the French wage and labor cost structure over the last 35 years, we draw on representative extractions of the DADS (Déclarations Annuelles des Données Sociales) data, which is the main administrative data source constructed by the French national statistical office (INSEE) from social security records on all private sector French workers[2] (see Appendix B and Charnoz et al, 2011).

The DADS data contains official information on annual *net earnings* since 1976. Those earnings include basic earnings, as well as performance and non-performance related premiums and bonuses. They are net of employers and workers' social contributions but gross of income taxes. We divide them by the numbers of working days in a given to obtain net daily wages.

Gross wages correspond to net wages plus employee social security contributions. They are the nominal wages stipulated in working contracts and on which negotiations typically take place. Gross wages are available in the DADS from 1993 onwards. Before that date, they have been computed from the net wages using the Institute of Public Policy tax simulator (TAXIPP, see appendix B).

We call *labor cost* the actual cost paid by a firm for a given worker a given year. It includes both employer and employee social security contributions and has been entirely computed from net wages using TAXIPP.

Employer and employee social security contributions are paid monthly and are directly deducted when monthly earnings are paid by firms to their employees. In contrast, income tax is paid annually by households depending on the total household labor and capital income. Assuming income tax is split between household members proportionally to their earnings, we infer *supernet earnings* by deducting an individual's income tax share from her net earnings. Those *supernet earnings* are close to disposable income, except that they do not include all transfers and benefits. To this aim, we use a newly available tax record, the Enquête Revenus Fiscaux et Sociaux (ERFS), that contains tax information for a subset of the French population (see Appendix B for all computation details).

Figure 1 shows the evolution of the log of the ratio d9/d1 for the net wage, gross wage and labor cost distributions. Appendix figure C3 is similar but also includes the ratio d9/d1 for the supernet wage. Those distributions had different fates: while the net wage d9/d1 ratio has decreased by 7 log-points over the period 1976-2010, the labor cost equivalent has increased

[2] Before 1993, we use an extraction with 1/24 of the French workers. After 1993, we use a 1 twelfth extraction [to be done: use exhaustive records instead]. Years 1981, 1983 and 1990 have been lost by INSEE and are therefore missing.

by 16 log-points (see also Appendix C for log ratios d8/d2 and d7/d3). Gross wage inequalities have also decreased, but slightly less than net wage inequalities. Finally, changes in the income tax schedule have not counteracted the reduction in net wage inequalities, implying that inequalities in terms of wages net of all social security contributions and taxes have also decreased.

Two main types of social security reforms explain those discrepancies between the wage and labor cost distributions. The first is a progressive uncapping of social security contributions in the 1970s, 1980s and early 1990s. To align contributions to the potential rights and benefits they were financing, the contributions were historically capped, so that the share of gross wages that lied above the "social security threshold" (SST) where exempt or submitted to very low rates of contributions. As the SST lied around the 7th decile of the gross wage distribution, only individuals in the top 3 deciles have been concerned by the progressive uncapping (Figure 3). As a consequence, the uncapping in the 1970s, 1980s and early 1990s only affected the difference between labor cost and net wage upper-tail inequalities, while lower-tail inequalities in terms of both concepts remained unchanged (Figure 2).

The second series of policies that redistributed the burden of social security contributions from low- to high-wage earners started in the mid-1990 and are still in place today. They consist in partial exemptions of employer social security contributions for low-wage workers[3]. Those exemptions are total for workers paid the national minimum wage and decrease linearly up to the point where they have entirely disappeared (1.6 times the minimum wage in 2010). As a consequence, they have impacted only the three first deciles of the gross wage distributions (Figure 3), and have only affected in the 1990s-2000s the lower-tail of the wage and labor cost distributions (Figure 2).

[3] See Appendix A. Those exemptions started for workers whose wage was below 1.3 times the national minimum wage. They have been progressively extended to higher levels of the wage distribution, up to 1.6 times the national minimum wage during the period covered by our data.

2. Revisiting skill biased technical change in France

To assess the existence of skill biased technical change in France, we draw on the macro-level approach introduced by Katz and Murphy (1992). In this approach, skill biased technical change is identified from the long-term changes in the relative wages of skilled and unskilled workers that cannot be explained by changes in the relative supply. Typically, an increase in the relative wages of skilled workers (as compared to unskilled) concomitant with an increase in their relative supply suggests a large increase in the demand for those workers, which is itself attributed to skill biased technical change.

A) Basic framework

We start with the simple model of Autor, Katz and Kearney (2008) to derive an estimable equation based on this idea. Namely, we assume that aggregate output Q depends on two inputs, college equivalents (c) and high-school equivalents (h) according to the following CES production function:

$$Q_t = [\alpha_t(a_t N_{ct})^\rho + (1-\alpha_t)(b_t N_{ht})^\rho]^{1/\rho} \tag{1}$$

where N_{ct} and N_{ht} are the quantities employed of college equivalents (skilled labor) and high school equivalents (unskilled labor) in period t. a_t and b_t are technical change parameters augmenting skilled and unskilled labor inputs. α_t is a time-varying technology parameter that indexes the share of work activities allocated to skilled labor. $\sigma = 1/(1-\rho)$ is the elasticity of substitution between skilled and unskilled workers. Skill-biased technical changes involve increases in a_t/b_t or α_t.

Assuming that the labor cost (and not their wage) associated to both college and high school equivalents are equal to their marginal products, we can derive from (1) the following equation:

$$\ln\left(\frac{w_{ct}}{w_{ht}}\right) = ln[\alpha_t/(1-\alpha_t)] + \rho \ln\left(\frac{a_t}{b_t}\right) - \frac{1}{\sigma}\ln\left(\frac{N_{ct}}{N_{ht}}\right) \tag{2}$$

where w_{ct} and w_{ht} are the labor costs associated with college and high-school equivalents. Equation (2) can be rewritten:

$$\ln\left(\frac{w_{ct}}{w_{ht}}\right) = \frac{1}{\sigma}\left[\mathrm{D_t} - \ln\left(\frac{N_{ct}}{N_{ht}}\right)\right] \tag{3}$$

where $\mathrm{D_t}$ represents relative demand shifts favouring college equivalents. The impact of changes in relative skill supplies on relative wages depends inversely on the magnitude of aggregate elasticity of substitution between the two skill groups. The greater is σ, the smaller the impact of shifts in relative supplies on relative wages and the greater must be fluctuations in demand shifts $\mathrm{D_t}$ to explain any given time series of relative wages for a given time series of relative quantities. Changes in $\mathrm{D_t}$ can arise from (disembodied) SBTC, non-neutral changes in the relative prices or quantities of non-labor inputs, and shifts in product demand.

As is common in the literature, we approximate D_t by a time trend, and augment this equation to take into account the unemployment rate or institutional factors such as the minimum wage.

B) Results

Our aim is to check if estimates of (3) in France are different if one considers on the left-hand-side labor cost instead of wages. To construct the time series of wages, labor costs and supplies of college and high-school equivalents, we apply the quality and composition adjustments made in previous literature (see Appendix B).

Table 1 gives the results. Results are still to be stabilized and should not be over-interpreted at that stage. Estimates imply an elasticity of substitution between high-school equivalents and college equivalents of about 3, which is about twice higher than similar estimates in the U.S. We also find some evidence of (limited so far) skill biased technical change when looking at the labor cost (as shown as the positive estimated coefficient for the time trend), while we do not observe it with the net wage.

The basic framework has been refined Card and Lemieux (2001) to take into account the fact that experience groups are not perfect substitutes within skill groups. Results presented in Table 2 confirm the evidence of some skill biased technical change in France.

Finally, Lindley and Machin (2011) suggest that skill biased technical change might be strongest at the top of the skill distributions, i.e. when comparing the relative wages (or labor costs) and supplies of postgraduates workers and workers with a college degree or less. Primary analysis based on labor costs suggests that such a phenomenon is also at place in France. However, results again differ when using net wages instead.

3. Fiscal policy as an efficient institutional tool to reduce wage inequalities?

In the absence of the social security reforms in the past forty years, labor cost and wage inequalities would have evolved according to parallel trends. Figure 5 illustrates two extreme cases regarding these parallel trends, assuming either that labor cost or net wage inequalities would have remained the same in the absence of changes in the relative wedge of social security contributions. The first case implies that net wage inequalities would have increased in the absence of social security reforms, and that reforms have been effective in reducing those inequalities. The latter case implies that the only effect of social security reforms was to increase labor costs that would have been decreasing otherwise.

To discuss which of those two extreme scenarios would be the most likely, it is necessary to make some hypothesis on the incidence of social security reforms. Both theory and empirics tend to support the idea that social security reforms are passed on to workers in the long run. In theory, this is because labor costs should not depart from workers' productivity for long periods of time. Even in a very rigid labor market, with strong hiring and firing costs, firms that spend for skilled and unskilled workers according to their marginal productivities are more efficient, and thus more likely to survive and to take over in the long run. This basic theoretical argument implies that labor costs should not be impacted by taxes in the long run.

Regarding empirics, the main argument against a long-run incidence on employers is that labor cost inequalities have increased in most developed countries, suggesting that they would have increased in France anyway, even in the absence of social security reforms. More indirectly, we can also rely on the macro analyses of the labor share (e.g. OECD, 1990). These studies showed that the labor share have decreased over time in most developed countries despite an increase in the overall wedge of labor taxes (payroll taxes, labor income taxes, and social security contributions), suggesting that labor taxes are passed on to workers.

However, direct empirical evidence on the incidence of social security contributions and payroll taxes partially challenges this view. Gruber (1996) finds that the incidence of payroll taxes is indeed on workers, but more recent contributions by Saez et al. (2012) for Greece, or Lehmann et al. (2013) and Bozio et al. (2015) for France suggest that the economic incidence of social security contributions is similar to the nominal incidence, meaning that changes in employers' social security contributions are passed on employers, while changes in employees' social security contributions are passed on employees. What could explain the difference between the "long-run" incidence captured when looking at the macro-level evolution of wage and labor cost inequalities in the long run, and short-run incidence captured by studies based on micro-level panel data is that the latter usually apply to already employed workers and neglect any type of long-run adjustment taking place at the extensive margin by job or firm creation and destruction.

A last point worth discussing is the role of the minimum wage, which both impacted the design of recent social security exemptions and forced their incidence to be on workers. France has a relative high minimum wage which is sometimes viewed as an obstacle to employment. Instead of lowering the minimum wage, which is both politically hard to do and anti-redistributive, policy makers started to implement employers' social security exemptions for low-wage earners in the mid-1990s, with the idea that it would reduce the cost of labor and favour employment. Those policies indeed seemed to have had positive effects on employment (e.g. Kramarz and Philippon, 2001), but those effects are hard to distinguish from the potential negative effects that resulted by the fact that in the same time the minimum wage kept increasing. In terms of wages, the yearly increases in the minimum wage that paralleled the social security exemptions for employers were partly forcing those employers to pass on those exemptions to workers.

To assess the long-run incidence of social security reforms in the absence of a minimum wage that forces this incidence to be on workers, we should therefore focus on the first series of reforms that impacted the upper part of the wage distribution. In that case, changes in workforce composition due to employment effects are also less of an issue as the unemployment rate is close to 0 among (potential) top wage earners. Figures 1 and 2 show that labor cost inequalities increased steadily between 1980 and the early 2000s, which is exactly the period when the bulk of technical change took place. In contrast, net wage inequalities did not increase. This suggests that even without a forcing device such as the minimum wage, the uncapping of social security contributions that occurred in the 1980s and early 1990s was passed on to workers whose wages would have otherwise become more unequal.

To conclude, our results are suggestive that reforms in social security contributions have been an effective redistribution tool in France, even if they have mainly been designed to reduce unemployment. This suggests that tax policy, which has been neglected from the analyses of wage inequalities outside the top 1%, is one of the most efficient institutional tools to reduce wage inequalities in the long run.

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Figures and Tables:

Figure 1: Wage and labor cost inequalities in French private sector for male workers: d9/d1 1976-2010.

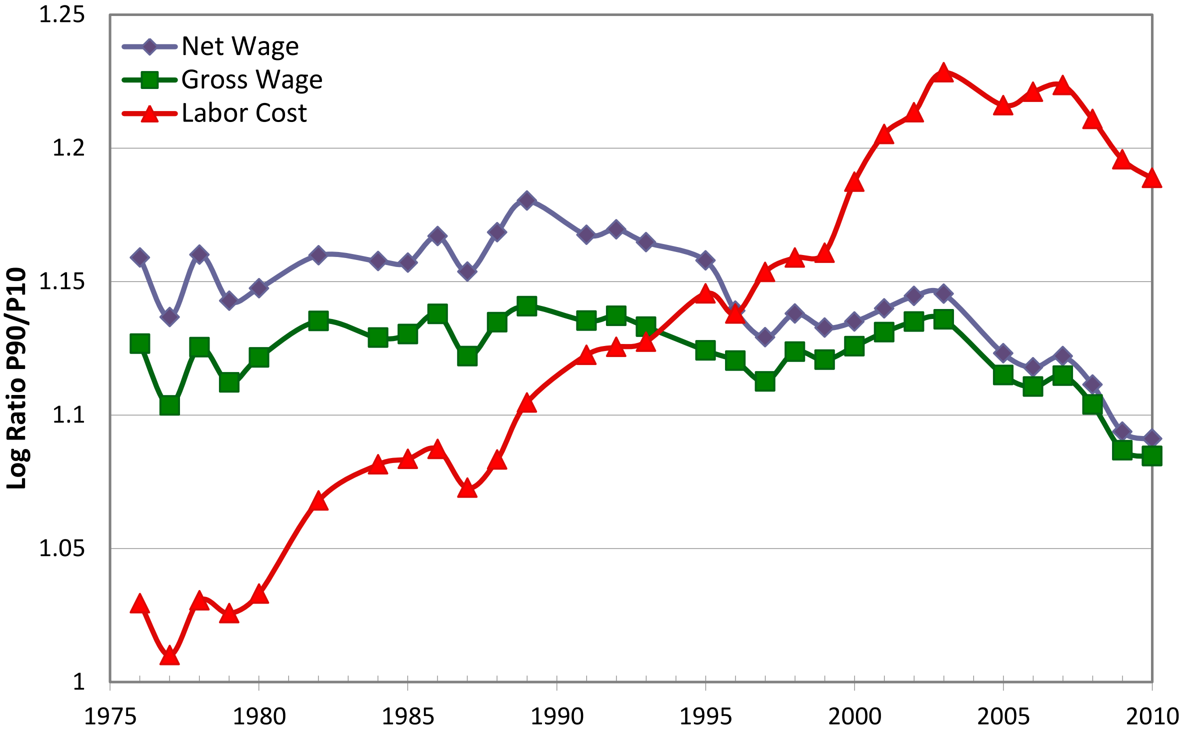
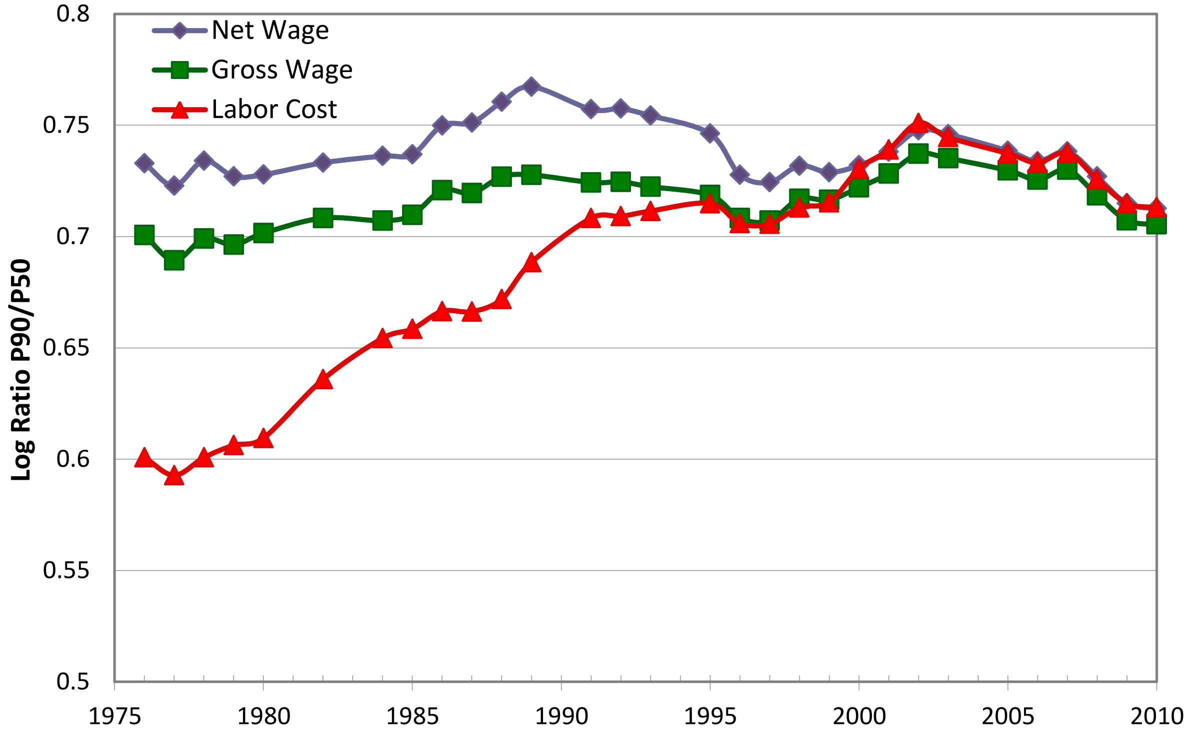


Figure 2: Upper-tail and Lower-tail wage and labor cost inequalities in French private sector: 1976-2010.



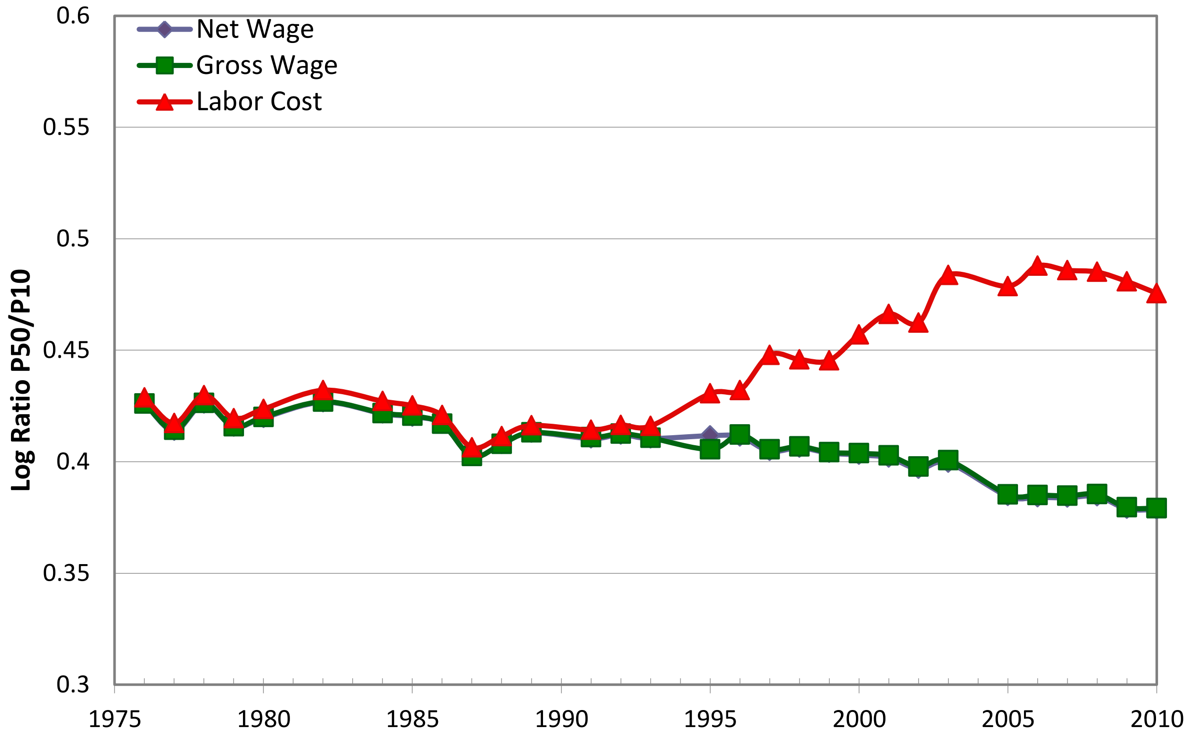
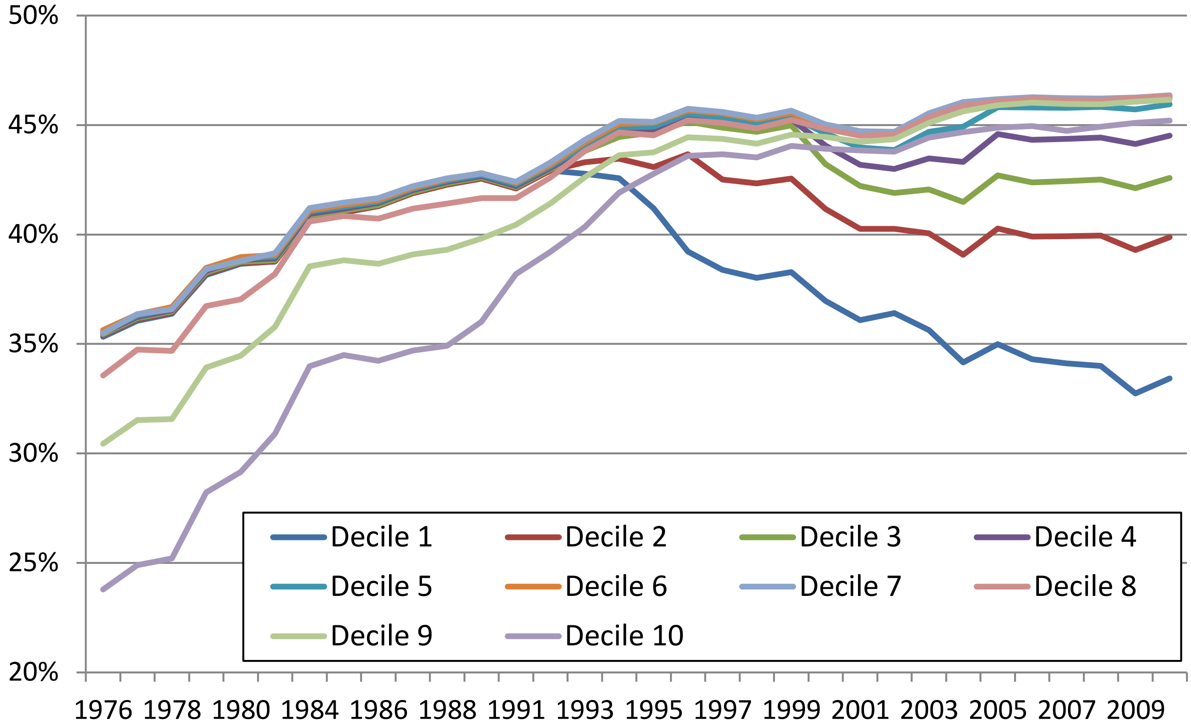


Figure 3: Total Social security contributions as a fraction of gross wage in the different deciles



Notes: The Figure provides the ratio of the average total social security contributions (employer and employee part) to the average labor cost in each decile of the labor cost distribution.

Figure 4: Detrended College versus high school wage differential and relative supply, 1976-2008

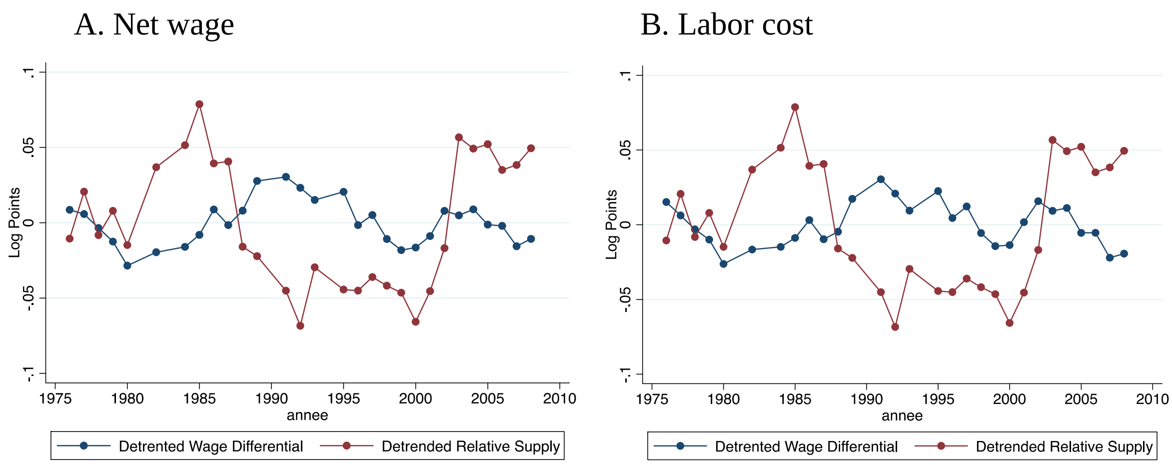
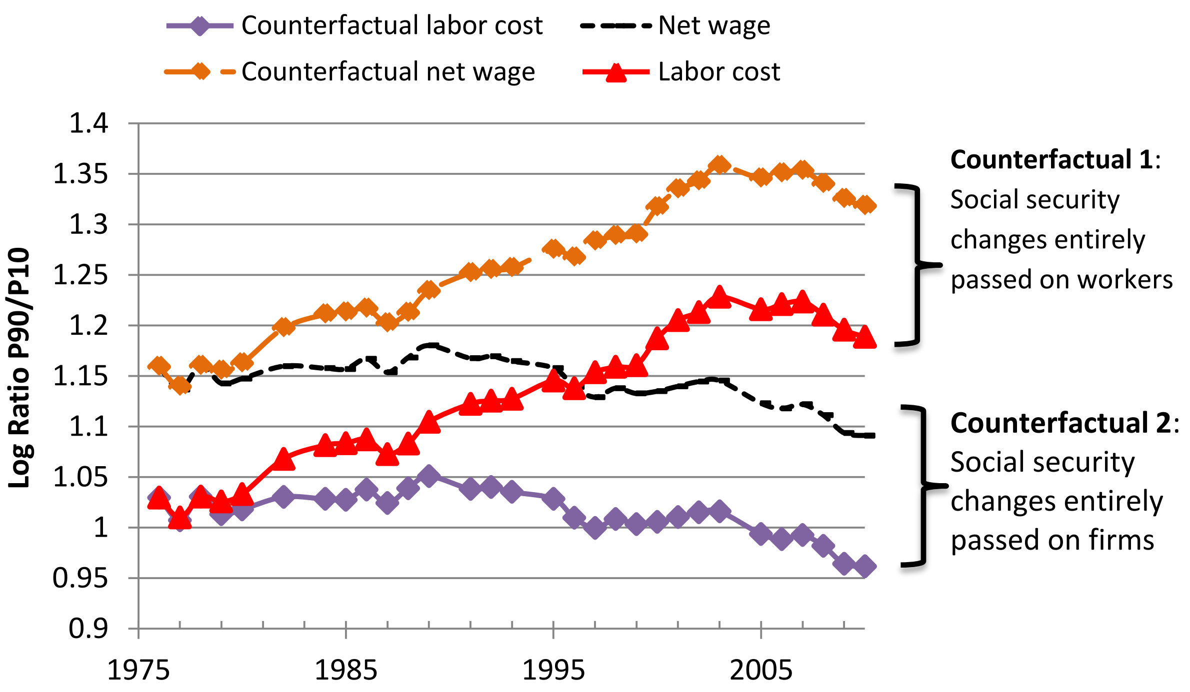


Figure 5: Counterfactual Wage and labor cost inequalities in the absence of tax changes: two extreme cases.



Notes:

Table 1: **Regression models for the college/high school log wage gap, males, 1976-2008**

	Log net wage gap			Log labor cost gap		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
CLG/HS relative supply	-0.138**	-0.103	-0.037	-0.204***	-0.189*	-0.136
	(0.037)	(0.097)	(0.107)	(0.059)	(0.092)	(0.089)
Time	0.000	0.001	0.008**	0.003***	0.004*	0.012***
	(0.490)	(0.002)	(0.004)	(0.000)	(0.002)	(0.003)
Time^2 / 100		-0.000	-0.000*		-0.000	-0.000**
		(0.000)	(0.000)		(0.000)	(0.000)
Male prime age unemp. rate			-0.000			0.001
			(0.001)			(0.001)
Log real minimum wage			-0.187			-0.298***
			(0.109)			(0.091)
Observations	28	28	28	28	28	28
R-squared	0.195	0.202	0.336	0.868	0.868	0.915

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column presents an OLS regression of composition-adjusted college/high school net wage or labor cost differential on the indicated variables.

Table 2: Regression models for the college/high school log wage gap by potential experience group, males, 1976-2008

Dependent variable:	Log net wage gap		Log labor cost gap	
	(1)	(2)	(3)	(4)
Own supply minus aggregate supply	0.028	0.027	0.006	0.005
	(0.018)	(0.018)	(0.016)	(0.016)
Aggregate supply	-0.0056	-0.140	-0.126	-0.251**
	(0.097)	(0.122)	(0.087)	(0.108)
Time	0.003***	0.004**	0.006***	0.009***
	(0.001)	(0.002)	(0.000)	(0.002)
Log real minimum wage		-0.222		-0.331*
		(0.180)		(0.160)
Male prime age unemp. rate		0.002		0.004
		(0.003)		(0.002)
Observations	116	116	116	116
R-squared	0.726	0.728	0.798	0.805

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Each column presents an OLS regression of composition-adjusted college/high school net wage or labor cost differential on the indicated variables. All columns also include a dummy variable for the four potential experience groups.

Appendix A: institutional details on social security contributions and income tax in France

To be completed

Appendix B: Data and methods

1. Data and variables

DADS panel – EDP

The database is a panel that comes from two sources. Wages and job-related information comes from the DADS panel and education information from the EDP database. First, the DADS panel is a representative extraction of the DADS (*Déclarations Annuelles de Données Sociales*) data, which is the main administrative data source constructed by the French national statistical office (INSEE) from social security records on all private sector French workers (see Appendix B and Charnoz et al, 2011). We used all the annual extractions, except for 1981, 1983 and 1990 years due to missing data and 1994 due to bad quality of the data. The panel contains individuals born in October of even years and who worked at least once in the private sector. Second, the EDP database (*Échantillon Démographique Permanent*) consists of demographic information, including the highest degree for individuals born one of the four first days of October of even years. Information is available for census years: 1968, 1975, 1982, 1990 and 1999 for the old census design and one fifth of the population every year starting in 2003. The two databases are matched by the French statistical administration based on date of birth and names.

Working time variables

Hours worked are available from 1993 onwards. This prevents us from studying hourly wages for the whole period. Nevertheless, number of days of each job spells are available as well as a full-time dummy variable. Restricting ourselves to full-time full-year jobs thus enables us to measure wages. Because of these data issue, our analysis is based on the full-time full-year population.

Earning variables and tax simulation with TAXIPP

We use three concepts of individual annual earning, calculated from the net fiscal earning variable using the Institute of Public Policy tax simulator (TAXIPP). TAXIPP applies the payroll tax legislation to compute employers' and workers' social security contributions since the beginning of the 70s. To our knowledge, it is the most comprehensive existing simulator, including both a long time-span, and a large set of small specific contributions on top of the general schedule. Hence, it allows the computation of the contributions at the individual level taking into account relevant individual characteristics (private sector, white collar worker, number of hours worked) and firm characteristics (number of employees). It is key for this study to be able to rely on a simulator that can account for most of the complex rules of the French legislation, which includes several thresholds where marginal tax rates change, a different schedule for white and blue collars, and several exemptions and special rules.

The broader concept of earning is the labor cost, which includes all social security contribution. It is the actual cost paid by the firm. The gross wage does not include employers' social security contributions but include the workers' contribution. The net wage is net of all social contributions but is not net of the income tax.

Education variable

We use the variable (*dip_tot*) homogenized by the French National Institute of Statistics (INSEE) coming from the censuses. Following Abowd and ali. (1999) and Charnoz et al (2011), we use a breakdown of the highest diploma in eight categories. We then construct four education groups (right column of table 3). Unfortunately, the precision of the original census variable does not allow us to differentiate between graduates and postgraduates.

Table 3 - Education variable

dip_tot	French label	English label	Education variable
1	Aucun diplôme déclaré (aucun diplôme ou pas présent au recensement)	No diploma	1
2	CEP, DFEO	Elementary school	1
3	BEPC, BE, BEPS	Junior High School	1
4	CAP, BEP, EFAA, BAA, BPA, FPA 1er	Vocational basic	1
5	Baccalauréats technique et professionnel, Brevet professionnel , autres brevets BEA BEC BEH BEI BES BATA,	Vocational advanced	2
6	Baccalauréat général, brevet supérieur, CFES	High School Graduate	2
7	BTS, DUT, DEST, DEUL, DEUS, DEUG, diplôme professions sociales ou de la santé	Undergraduate university	3
8	Diplôme universitaire de 2ème ou 3ème cycle, diplôme d'ingénieur, grande école	University Graduate	4

We use a four-categories education variable: high school dropouts, high school graduates, some college and university graduate.

School-leaving age and school leaving year

The school-leaving age is available for years 1968, 1975 and 1982. As information collected by these three censuses is not always consistent, we correct the information by keeping the higher school-leaving age stated as the correct one. For 75% of the global sample, we have missing information because the individual finished her studies after 1982. For missing data, we impute a school-leaving age based on the educational attainment information (legal minimum school-leaving age for high school dropouts, 18 for individuals who only high school graduate, 21 for graduates, 24 for post graduates).

Experience variable

Unlike the article using the CPS databases, we don't define experience as the number of years since the end of schooling. Instead, we take advantage of the long panel nature of our data and define experience as the cumulative sum of time worked over years. Charnoz et al, 2011 do likewise. Share of working days per year are cumulated over the years since the beginning of the panel, 1976. For people who were presumably working before 1976, we use their school leaving year and assume that they worked full-time between the end of their study and 1976. We argue this is not a strong assumption because the male working force between 25 and 60 years old was mainly full-time (cf. Bozio, Blundell, Laroque IFS WP 2011) and male employment rate was high. For missing years, we impute an annual share of working days based on the year before. Following Autor, Katz and Kearny (2008), we cluster experience into four categories (0-9, 10-19, 20-29, 30-39 years).

2. Methodology

To a large extend, our methodology is based on the one of Autor, Katz and Kearny (2008). We consider two different samples for the measure of wage premiums (*wage sample*) and for the relative labor supply measure (*supply sample*). Indeed, the wage premiums measure the price of the different education groups and must be as homogenous as possible along the period. The relative supply measure is based on a broader conception of the sample, where we try to recompose aggregate quantities of labor supplied across groups.

The *wage sample* contains full-time full-year workers from the private sector aged 26 to 60 with 0 to 39 years of potential work experience. We trim the bottom part of the distribution by excluding people whose total annual earning is less than 75% of the minimum wage.

The only restrictions on the *supply sample* are imposed by the data. Because they were introduced in 2002, we have to drop unemployed individuals receiving benefits. Yet we don't restrict the sample to full-year or full-time workers.

Relative Wage Series

We calculate the composition-adjusted college/high school relative *wage series* using the previous *wage sample*. The following method applies two the three concepts of wage considered. The data are sorted into two sexes – four categories of education (high school dropouts, high school graduates, some college and university graduate) – four groups of experience (0-9, 10-19, 20-29, 30-39 years). For each year and sex, the log real wage is regressed on dummies of the four-categories education variable, a quartic in experience, geographic dummies for the population density, interaction of the experience quartic with three education dummies (university graduate, some college and high school graduate). For each education – sex – experience cell, the composition-adjusted log wage is the predicted value from the previous regressions evaluated for the mean geographic region as well as for the corresponding education, sex and experience of the cell. These 992 cells (we have 31 years) are collapsed at the education and year level by a weighting average over the group. For each year, we calculate the weight as the number of individual in a cell divided by the total number of individual.

Relative Supply Measures

We calculate the *relative supply measures* using the previous *supply sample*. The quantity each individual supplies each year cannot be a number of hours because of missing information. Instead, we count one for each individual. These quantities of labor supplied are aggregated at the number of experience year, sex and education level to form a *quantity series*. At the same time, we calculate a normalized price measure at the experience group – sex – education categories level by averaging over the years the wage of each cell normalized by the wage of high school graduate male with ten years of potential experience. This latter series of price is called "*efficiency unit"* price, as it is supposed to represent how efficient is a cell relative to the others in the production process. These *efficiency units* are computed based on the reduced *wage sample*. For each year, prices and quantities are brought back together by the aggregation of quantities over sex and experience groups: at the education level, the supply is the sum over sex and experience groups of each group efficiency unit wage multiplied by the quantity of labor supplied by the group.

Appendix C: Additional Figures and Table

1) **Other interdecile ratios:**

Figure C1: Wage and labor cost inequalities in French private sector: 1976-2010, d8/d2.

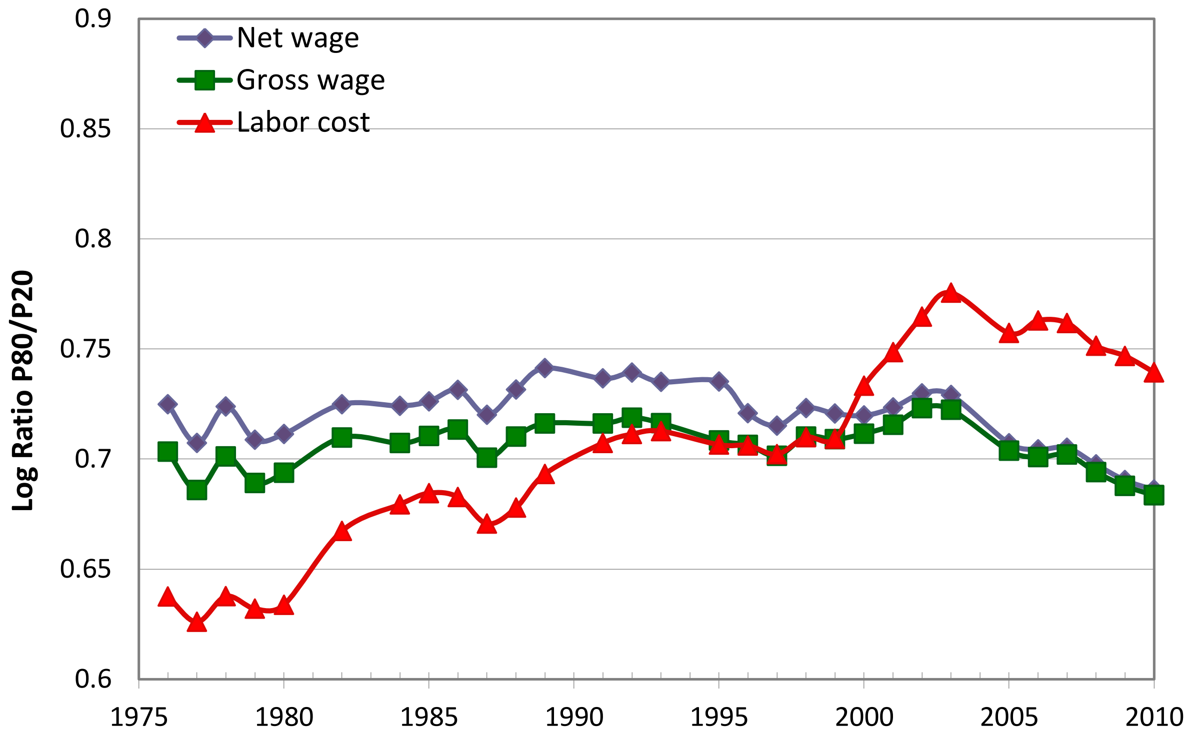


Figure C2: Wage and labor cost inequalities in French private sector: 1976-2010, d7/d3.

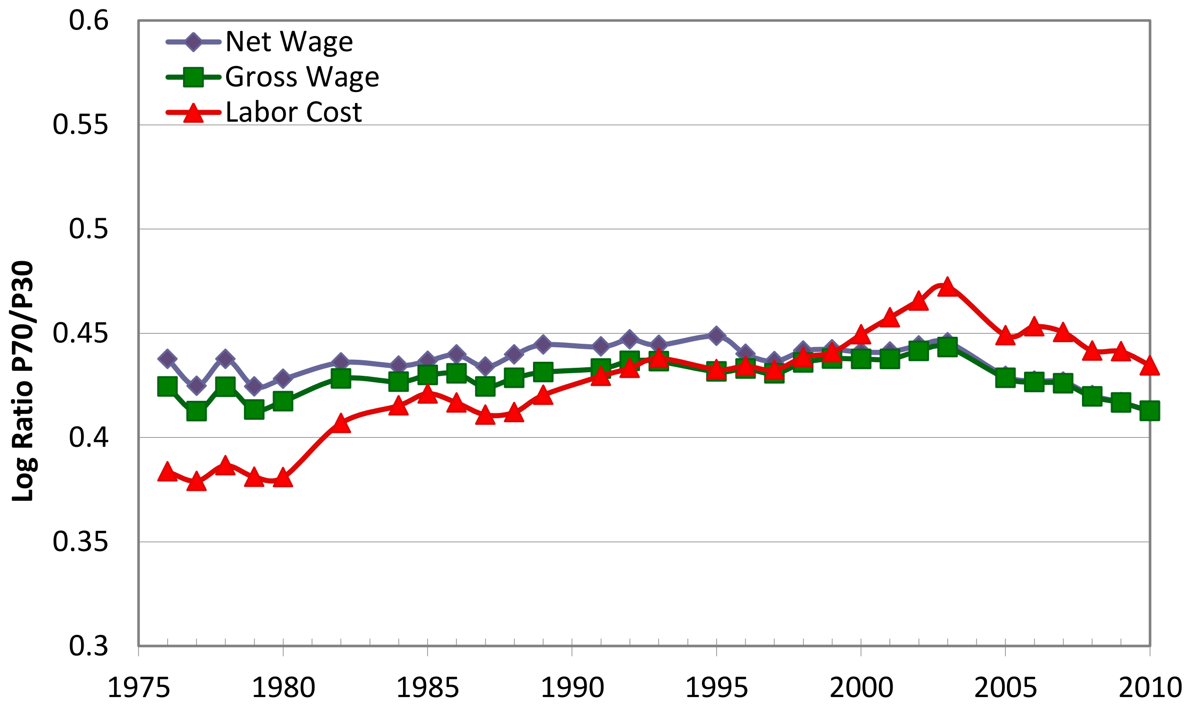
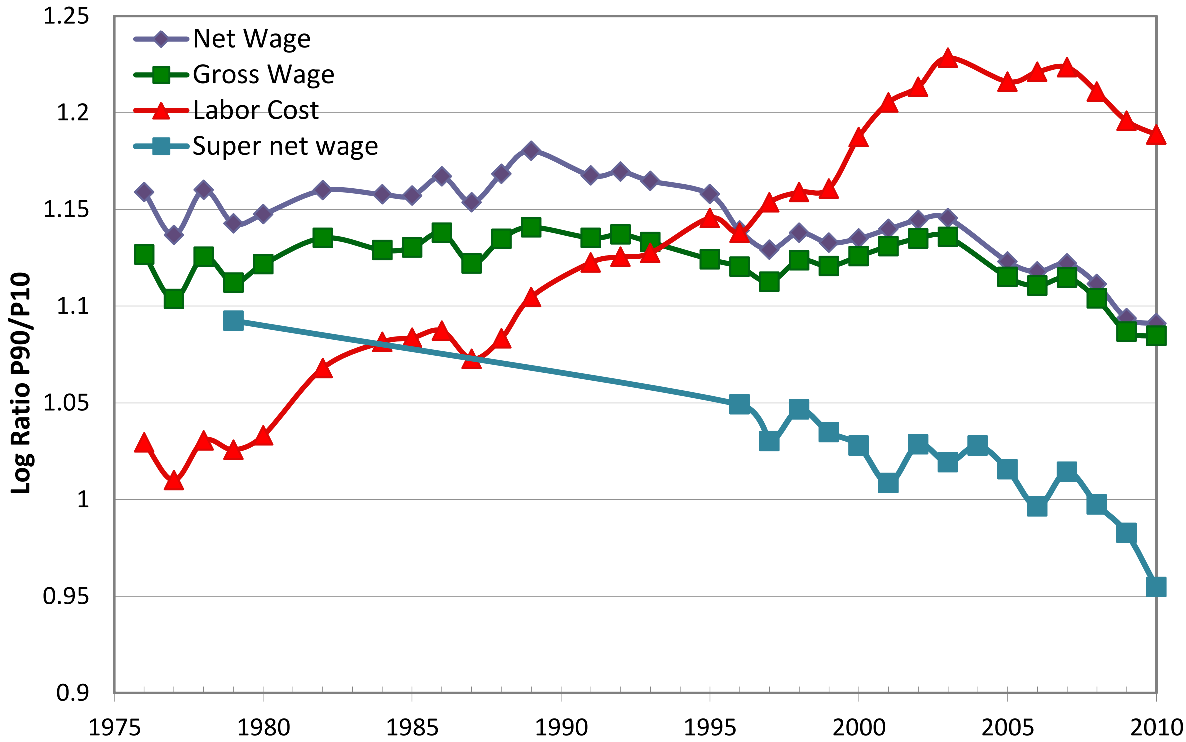


Figure C3: Supernet wage, wage and labor cost inequalities in French private sector: d9/d1 1976-2010.


Net Wage
Gross Wage
Labor Cost
Super net wage
Log Ratio P90/P10
1.25
1.2
1.15
1.1
1.05
1
0.95
0.9
1975
1980
1985
1990
1995
2000
2005
2010