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► **To cite this version:**

Jérôme Gautié, Patrice Laroche. Minimum Wage and the Labor Market: What Can We Learn from the French Experience?. 2018. ⟨halshs-01842434⟩

HAL Id: halshs-01842434

<https://shs.hal.science/halshs-01842434v1>

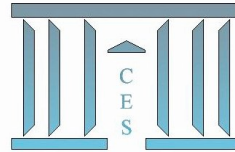
Submitted on 18 Jul 2018

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Jérôme GAUTIÉ, Patrice LAROCHE

2018.19



Minimum Wage and the Labor Market: What Can We Learn from the French Experience?

Jérôme Gautié¹, Patrice Laroche²

July 9, 2018

Abstract : Since it was introduced in 1950, and even more since it was reformed in 1970, the statutory minimum wage has been playing a key role in the French labor market. It has very specific fixing mechanisms, and, from the eighties, it has been one of the highest among the OECD countries – both in relative and absolute terms. After presenting the specific features of the minimum wage setting regime in France as well as the minimum wage policies implemented since the 1950s, we provide a comprehensive survey of existing empirical evidence on the impacts of the minimum wage on the French labor market. We use a meta-analysis to draw the lessons from the empirical studies on its effects on employment. We also survey the other potential effects, such as the impact on wage bargaining and other wages, on inequalities, on profit and prices, on working conditions.

Keywords : Minimum wage; France; wage bargaining; wage regulation

JEL J31, J32, J38, J23, C18

1. Introduction³

Statutory national minimum wage has a long history in France. It was first introduced in 1950 and has undergone since then several reforms of its fixing mechanisms as well as important changes in the public policy determining its evolution. In a comparative perspective, the French minimum wage is nowadays one of the highest among OECD countries, both in absolute and relative terms (i.e. as compared to average and median wages). It may provide therefore a good opportunity to assess the effects of the minimum wage when it really bites.

Both political and academic debates over the minimum wage have often focused on employment effects, in particular in the United-States (see for instance Neumark, 2017, for a recent overview of the issues debated). These debates have also been important in France. But they have taken place in a specific context of strong social and political support for the minimum wage, since, at least from the end of the sixties, it has been considered as one of the

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³ This research has received a financial support from the CEPREMAP. We are grateful to Philippe Couteux, Andrea Garnero and André Zylberberg for very valuable comments. The usual disclaimers apply.

main pillars of the French “social model” (Gautié, 2015). Social inclusion, implying limited income inequalities, has indeed been a key concern of both right and left-wings government. France has not experienced an increase in wage inequalities during the last three decades, in sharp contrast with almost all the other OECD countries. But the price to pay may have been high, as, according to a widely shared view, France may be a good illustration of the “penniless/jobless” trade-off epitomized by Paul Krugman (1994) in the mid-nineties. Indeed, unemployment has been high and persistent during the last mid-1980s, and many have pointed out the potential role of the high labor costs, in particular at low skill levels. To countervail the potential negative impact of the SMIC on employment, several policies have been adopted, starting as soon as the 1970s, with important developments since the mid-1990s.

The aim of this essay is to review the available evidence on the impact of the minimum wage on the French labor market, and to assess the lessons that can be drawn for other countries. In section 2, we present the strong peculiarities of the French minimum wage institution and policy one must have in mind before addressing evaluation issues. Section 3 analyses the empirical evidence on the employment effects. Section 4 reviews the impacts on wage determination, and their outcomes in terms of wage differentials and careers, and explores the potential effects on work conditions. Eventually, section 5 draws some general lessons.

2. The French minimum wage in a comparative perspective: some key specificities

2.1. Changes in minimum wage institution and policy: from the initial SMIG to the current SMIC

Introducing and reforming the statutory minimum wage: the historical context

It is only in 1950 that the freedom of collective bargaining over wages was restored in France by a law which set some of the main features of the post-WWII French industrial relations system. Wages, as well as all prices, had been under the control of government since 1939. One fear was that the reintroduction of competition in the labor market would induce a fall in wages, in particular at low skilled level. As a consequence, the 1950 law introduced two safeguards. First, industry collective agreements that had fix an industry minimum wage rate could be legally extended to the whole industry – meaning that even employers not members of employers’ organizations that had signed the collective agreements had to implement it, their workers being unionized or not. Second, a national legal minimum wage was introduced (the “interprofessionnal guaranteed minimum wage”, “*salaire minimum interprofessionnel garanti*”, the so-called SMIG) – in particular to protect the workers in industries not covered by collective agreements. It was conceived as an hourly wage floor, a living wage to provide the workers with a “*normal life, decent and fully human*”. In 1952, the SMIG was legally indexed to the consumer price index.

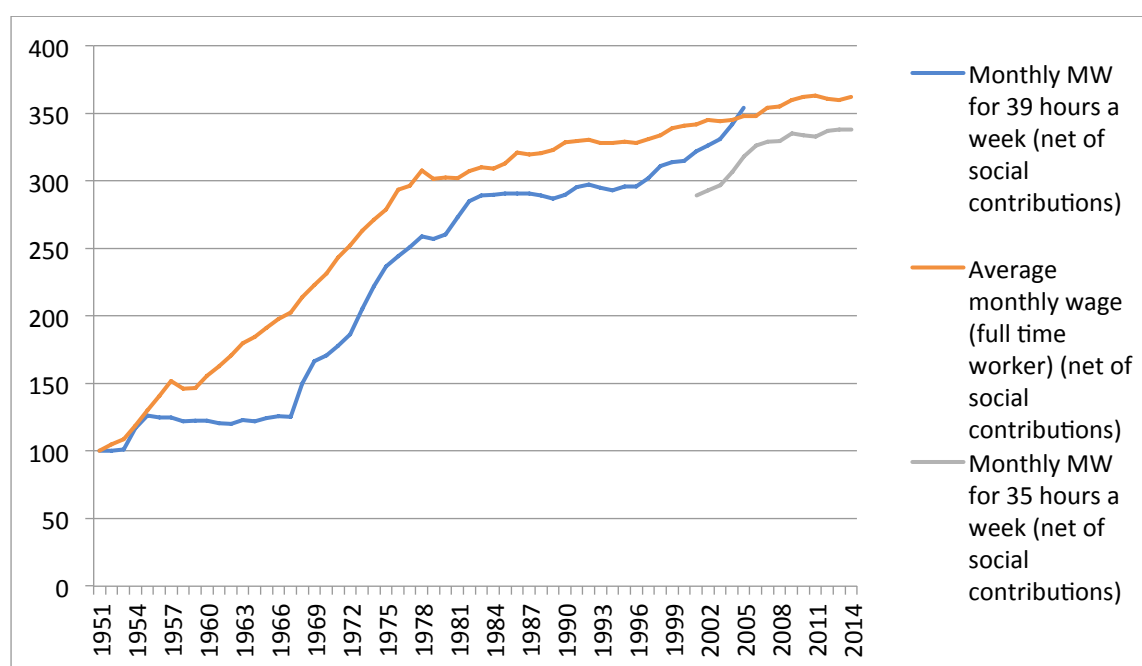
In the context of the aftermath of WWII, inflation was a crucial issue, because of the shortages due to the destructions and economic disorder. The government in particular was very keen on avoiding any wage inflation induced by minimum wage hikes. This fear had been reinforced by the experience of the first years of implementation, when the minimum wage increases had impacted the whole hierarchy of wages - Eastman (1954), see also below. Another concern was the potential negative impact of the minimum wage on small businesses – that were still very numerous at that time. The minimum wage policy was therefore quite restrictive, and as a result, up to the end of 1960s, the SMIG increased much less than the average wage (see **Figure 1** below). When the 1968 social events erupted, the widespread opinion was that the lowest paid workers had benefited much less than the others from the

tremendous growth period since WWII (i.e. an average annual growth rate of about 5% between 1950 and the end of the sixties). After the big wave of strikes, the SMIG was increased by 35.1% at the end of 1968. And it was decided to reform the fixing mechanisms of the minimum wage, because "*the SMIG failed to accomplish its mission, and it did not play the role of a social wage, and even less, of a civilization wage*"⁴.

From a wage floor to a solidaristic wage policy tool... and back to a wage floor

A new legal minimum wage was introduced in 1970, the "minimum across-industry growth wage ("*salaire minimum interprofessionnel de croissance*") - the SMIC, replacing the SMIG. During the following years up to the beginning of the eighties, because of the combined effects of the new indexation mechanisms (see section 2.2. below) and, above all, a very active policy of discretionary hikes, the SMIC increased much more than the average wage (**Figure 1**). This catch-up process was clearly reflecting a radical change in the governments' conception of the role of the minimum wage: from a simple wage-floor, as conceived by the initial 1950 law, it had turned into a solidaristic wage policy tool, aiming at reducing wage inequalities.

FIGURE 1
Evolution of the average monthly wage and the monthly minimum wage (MW), 1951-2014, (1951 = index 100; constant prices)



Source: Institut National des Statistiques et des Etudes Economiques (INSEE), 2017.

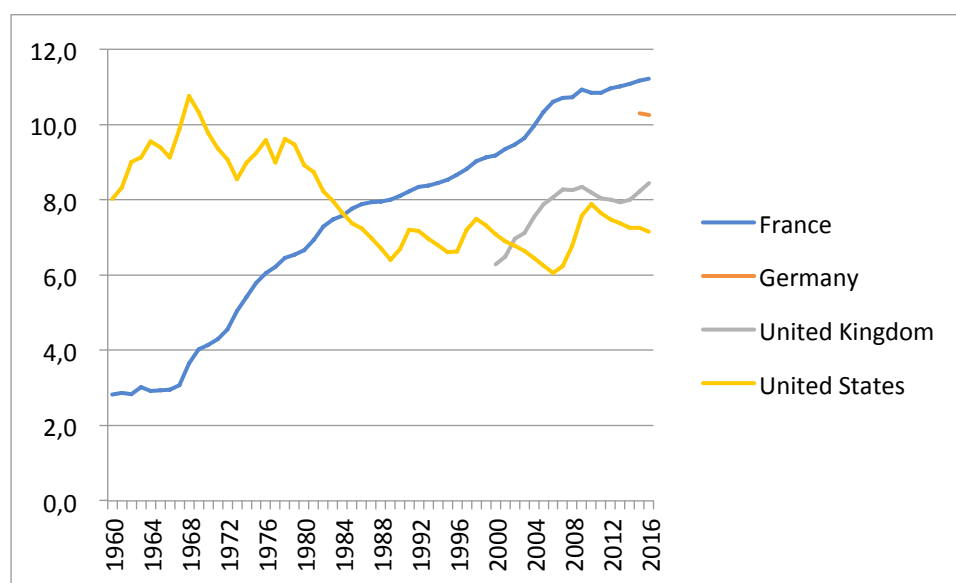
During the 1980 and up to the mid-1990s, the pace of SMIC growth was much lower than during the previous decade, as inflation, and, increasingly, unemployment had become major concerns. The SMIC increased rapidly again from the end of the nineties, because of a higher GDP growth, but also, and mainly, as a direct consequence of the "35 hours laws" adopted in 1998 and 2000, reducing the legal weekly working time duration from 39 hours to 35 hours. The choice was made not decrease the monthly wage of incumbent minimum wage earners (blue line in **Figure 1**) – i.e. workers already employed at the time the reduction in the

⁴ Pierre Herman, rapporteur of the law during the 1969 debate in the National Assembly, quoted by Metz (2006:34).

working time was adopted in their company; this meant that new entrants (after the adoption), at current hourly minimum wage rate, had lower monthly wages (grey line in **Figure 1**) – and therefore, were paid at lower *de facto* hourly rates - than workers who had joined the firms before the implementation of the law, who were now working also 35 hours a week, but paid 39 hours. Moreover, the gradual application of a working time reduction law resulted in the coexistence of several *de facto* minimum wage levels. Eventually, the system was harmonized in 2005, to return to a single hourly rate for minimum wage earners in 2006. Overall, this has induced a significative jump in the hourly minimum wage rate over the period 2000-2005. The policy was much more restrictive since then, even more with the great recession. From 2007, discretionary increases have been very limited, and the policy has returned to its initial conception of the minimum wage as a wage floor⁵.

Over the whole period (since the 1960s), the contrast between the American and the French minimum wage policies is sharp (see **Figure 2**). The purchasing power of the U.S. federal minimum wage has decreased by almost 28% between 1967 and 2016, whereas the French minimum wage has increased by 266% over the same period. In 2016, the purchasing power of the SMIC hourly rate (in 2015 US\$ PPPs) was 55% higher than the US federal minimum wage, 33% higher than the UK National Minimum Wage (first introduced in 1999), and more than 9% higher than the German minimum wage (first introduced in 2015). The contrast is also high in terms of minimum wage to median (respectively, mean) wage ratio: in 2016, the ratio for full time workers was 0.65 (resp. 0.49) in France, as compared to 0.35 (resp. 0.29) in the USA, 0.47 (resp. 0.42) in Germany, and 0.49 (resp. 0.41) in the United-Kingdom (Lübker and Schulten, 2018).

FIGURE 2
Minimum wage hourly rates in 2015 constant prices at 2015 U.S. dollars purchasing power parities



Source: OECD, 2017.

⁵ While the purchasing power of the SMIC had increased by 13.8% between 2001 and 2007, it has increased by only 2.5% between 2008 and 2014.

2.2. Coverage and fixing mechanisms: the political economy of the SMIC

High coverage and the resulting high support from workers

The French minimum wage (“SMIC”) covers legally almost all sectors and occupations except the civil servants⁶. The full rate applies to those of 18 years old and over, except apprentices. There are two specific rates for younger workers with less than six months of work experience (80% of full rate if 16 years old, 90% if 17 years old). The SMIC sets an hourly minimum rate for the *base* wage, not the whole compensation. It means that many bonuses and premiums that come on top of the base wage are not included in the hourly wage rate taken as the reference to control for the enforcement of the legal minimum wage: the profit-sharing premium, the seniority premium, and all the bonuses/premiums to compensate for specific employment or working conditions (such as: working at night; working unsocial hours; in a cold/hot or noisy, or dangerous environment; in a specific geographic area...).

Overall many “SMIC earners” (i.e. workers whose base wage has been directly impacted by the last minimum wage hike) have an hourly total compensation much higher than the SMIC - in 2013, for instance, more than 22% of SMIC earners in the private sector had an hourly total compensation at least 20% higher than the SMIC (Sanchez, 2016). A consequence is that the share of SMIC earners among employees in the private sector is high: about 10% or more since 1995 - with a peak of 16.3% in 2005 following the big hike induced by the "35 hours-week laws" (see above). This is a key element for understanding the very high support from workers and unions.

The key role of indexation mechanisms

A key specificity of the SMIC relies on the role of automatic mechanisms in the fixing of its hourly rate - introduced in 1970, and only slightly reformed in 2013. The SMIC rate is indexed to inflation and growth (through an indexation mechanism to wage growth). First, every time the consumer price index⁷ rises by at least 2 per cent, the SMIC is raised by the same percentage, as of the first day following publication of the relevant price index. Second, the SMIC must be raised annually by at least half the increase in the purchasing power of blue-collar (blue collar and clerk since 2013) workers’ base average hourly wage – i.e. the real increase in the wage rate excluding bonuses and premiums, and once controlled for compositional effects. The 1970 law also stipulates that the government may increase the SMIC more than what results from the automatic indexation mechanisms, in order to prevent an increasing (negative) gap between the evolution of the SMIC and the evolution of other incomes. This discretionary boost (called a "*coup-de pousse*") is acted by cabinet decree and occurs once a year (on the first of July between 1970 and 2009, on the first of January since 2010).

The interplay between unions and government in the minimum wage fixing

Since the 1950s trade unions have been strongly supportive of the minimum wage in France. Still, their role has been very limited in the fixing process. The law states that discretionary increase (i.e. beyond legal requirements of the automatic indexation mechanisms) by the government must occur after consultation with the *National Collective Bargaining Commission*, a tri-partite body with members from trade union, employers’ organizations, and

⁶ Even if the labor law (the so-called Labor Code) does not apply to the Public Service, the Supreme Administrative Court (*Conseil d'Etat*) stated in 1982 that the compensation of a Public Service employee could not be lower than the SMIC. From then, the lower base wage rate in the Public Service has been *de facto* indexed to the SMIC - see also below.

⁷ Up to 2013, it was the general CPI; since then, it is the CPI calculated only for the households in the first quintile of living standards.

government and the administration. But this consultation is in fact only formal, as the government sets in fact unilaterally the SMIC rate. This a key difference with the fixing mechanisms in the United-Kingdom, where the Low Pay Commission has an important role⁸, and even more with Germany, where the legal minimum wage is determined by a bi-partite Commission (unions and employers) - without any interference from the government, in the line of the *Tarifautonomie* tradition. In France, since 2009, an *Expert Committee* (five members from the academy, the administration and/or international organizations – such as the OECD) makes an annual report and gives its advice concerning the annual discretionary “boost”⁹.

Another important specificity for understanding the political economy of the minimum wage in France is the role of the State as an employer. About 20% of all French dependent workers are Public Service employees. As pointed out above, the lowest wage rate in the Public Service cannot be lower than the SMIC¹⁰. As a result, every SMIC hikes *de facto* impacts the public service wage bill - e.g. in 2013, the compensation of 18% of public employees (i.e. 945,000 out of more than 5 million) was impacted by the SMIC hike.

2.3. Policies to countervail the potential effects of the SMIC on employment: reductions in payroll taxes and tax credit.

One cannot assess the impact of the SMIC on the French labor market without taking into account that the minimum wage is deeply embedded in an array of institutions and public policies that have been introduced to countervail its potential impacts on employment. This is very important to understand both the methodological issues and the results of evaluation research work - and not only concerning the impact in terms of employment.

From the mid-1970s employment public subsidies targeted at youth have been implemented on a wide scale. Since 1992, the share of employed youth (according to the ILO criterion, including therefore apprentices) on a job benefiting from a public subsidy has never fallen under 25% - with a peak of 32% in 1998. The public subsidies consisted mainly in the possibility for the employer to pay a wage below the SMIC (in particular for apprentices) and/or to benefit from reductions in payroll taxes.

From the late eighties the potential negative impact of the SMIC on the low-skilled employment in general became also a serious concern. The “Five years law on employment” (*Loi quinquennale sur l’emploi*) adopted in 1993, introduced a system of reduction in payroll taxes for low paying jobs under the form of a general reduction in employers’ social contributions degressive with wage (i.e. the reduction, calculated as a percentage of gross wage was maximum at SMIC level and then declining to become null at a given wage level), compensated by a public subsidy from the State to the Social Security Funds. This mechanism, that was conceived to decrease the labor cost at SMIC level without affecting the purchasing power of minimum wage earners, has undergone many parametrical reforms since its introduction, concerning the amount of reduction (as a percentage of gross wage) and its degressive slope, as well as the wage threshold above which reduction stops. When the “35 hours weekly working time laws” were adopted at the end of the nineties (1998 and 2000), the choice was made to maintain the level of the monthly full-time SMIC, which meant an about 11% increase in the hourly SMIC - see above. This hike was also (partially) compensated by

⁸ The Low Pay Commission is an independent body that advises the government about the National Minimum Wage. There are nine commissioners "drawn from a range of employee, employer and academic backgrounds".

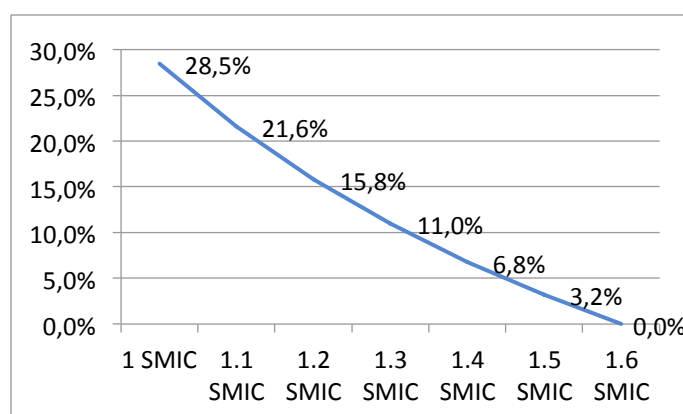
⁹ It is seen by some unions as an additional way to reduce their influence, and to give scientific legitimacy to the minimum wage austerity policy. Other unions are in favor of the existence of such independent committee but complain about its composition – i.e. mostly mainstream economists quite critical of the SMIC.

¹⁰ See footnote 6 above.

an increase in social contributions exemptions. In 2006, the complex system of exemptions was harmonized: the wage threshold at which employer's social contributions reductions stop is 1.6 SMIC, and the reduction amounts to a maximum of about 28.5 per cent of gross wage at the SMIC level and decreases progressively to 0 at 1.6 SMIC (see **Figure 3** for year 2017 as an illustration).

In addition to the social contributions exemption scheme, a tax credit was introduced in 2013 to reduce the labor cost on low skilled-medium skilled jobs – The *CICE*, “Tax Credit for Employment and Competitiveness”. The tax credit amounts to 7% (reduced to 6% in 2018) of the gross wage of all employees paid less than 2.5 time the SMIC (and 0% above this threshold).¹¹

FIGURE 3
The system of degressive reductions in employers' social contributions depending on wage level (in % of gross wage), year 2017



Source: Socio-fiscal legislation. In 2017, the reduction of the total labor cost at SMIC level amounts to the equivalent of 28.49% of gross wage for firms of 20 employees and more (28.09% for firms of less than 20 employees). The amount of the reduction (R) in social contribution exemptions is calculated as follows (for firms of 20 employees and more): $R = [k \times \text{annual gross compensation (AGC)}]$; with $k = (0.2849/0.6) \times [1.6 \times (\text{annual SMIC/AGC}) - 1]$; and k cannot be less than 0 and higher than 0.2849. This implies that k is decreasing when the wage increases (it is about 21.6% at 1.1. SMIC wage level, 15.8% at 1.2.SMIC, 11.0% at 1.3. SMIC etc. down to 0% at 1.6.SMIC and above).

Indeed, the impact of this policy on labor costs was significant. The ratio of labor costs at minimum wage over labor costs at median wage had reverted in 2005 to the level of 1975 and remained more or less constant up to 2015, erasing the impact on the total labor cost of almost 30 years of increase in the (gross) minimum wage over (gross) median wage ratio. But, as compared to other countries, labor costs at minimum wage level is still high in France in relative terms¹².

¹¹ At the time this article was written, the government had announced that the *CICE* would be suppressed in 2019 to be replaced by social contribution exemptions (for wages inferior to 2.5 SMIC) that would come in addition to the existing ones for gross wages up to 1.6 SMIC.

¹² In 2013 (OECD data), even after taking into account social contributions reductions (but not the *CICE* tax credit), the ratio [labor cost at minimum wage level/labor cost at median wage level of full time workers] amounted to about 49% in France, as compared to less than 47% in the Netherlands, 45% in the U.K., 44% in Spain and 40% in the U.S.

3. The evaluation of employment effects

There is now a sizeable literature exploring the relationship between minimum wage and employment in the U.S. and the U.K. The most recent reviews report no evidence of a significant adverse employment effect attributable to the minimum wage in these two countries (see for example, Doucouliagos and Stanley, 2009; Leonard, Stanley and Doucouliagos, 2014; Belman and Wolfson, 2014) - but the issue remains hotly debated in the U.S., see Neumark and Wascher (2008), and Neumark (2017). Both the French labour market and the minimum wage institution have strong specific features as compared to the U.S. or the U.K. ones. Hence, it is relevant to examine whether this finding of no employment effect applies to the French minimum wage law as well.

We apply a meta-analysis to explore the effects of minimum wage on employment in France. Meta-analysis is particularly useful for identifying and quantifying patterns, for drawing inferences from a diversity of results and for generalizing from results derived from numerous singular studies (Schmidt & Hunter, 2014; Stanley & Doucouliagos 2012). A number of empirical studies have explored the link between minimum wage and employment in France. Beyond differences in estimation techniques, studies provide different results due to differences in the composition of samples, time periods and econometric specifications. Meta-analysis can help map out such differences across studies, estimate their impact and guide future research towards less biased studies. We also assessed whether the publication selection bias influence the strength of the minimum wage/employment relationship.

More specifically, we employ a meta-regression analysis (MRA) to quantify the effect of minimum wage on employment, and to identify the main factors underlying the diversity in the results reported in existing empirical studies.

3.1. Data

The starting point for meta-analysis is the compilation of all published econometric studies that explore the relationship between minimum wage and employment. To create the sample, we started with a database search for relevant studies in *EconLit*, *ISI Web of Science*, *Business Source Premier*, *Ebsco* and *Google scholar*, using the following broad keywords: ‘minimum wage’, ‘SMIC’, ‘SMIG’, ‘employment’, ‘unemployment’. We also searched manually all the academic journals that have published studies on minimum wage, i.e., *American Economic Review*, *Journal of Human Resources*, *Journal of Labour Economics*, *Industrial and Labor Relations Review*, and so on. Our search also included examination of references in empirical studies to other studies that might report minimum wage /employment effects. The search was completed in September 2017.

In order to be included in the meta-dataset, studies had to meet two criteria. First, they had to report an estimate that could be statistically analysed. That is, studies needed to report elasticities or regression coefficients, sample size, standard errors and/or *t*-statistics. Second, employment rates had to be the dependent variable and minimum wages one of the independent variables. We excluded 21 studies from the meta-analysis because they were incompatible with the main group. Excluded are studies that (a) did not offer sufficient information to be included in the meta-analysis; (b) used a logit or probit model and focused on the probability of employment rather than the elasticity of employment with respect to minimum wage and (c) used data included through other study. The full list of the excluded studies and the reasons for exclusion is available in **Appendix A1**. We made the choice to collect published and unpublished studies.

From this process of elimination, we finished with 13 studies that contained 73 estimated minimum wage elasticities. All these studies are listed in **Table 1**, together with the number of estimates, period of the data and method of analysis.

TABLE 1
Studies included in the Meta-Analysis ($n=73$; $k = 13$)

| Authors/year of publication | No of estimated elasticities | Period | Main results (elasticities) | Outlet |
|-----------------------------|------------------------------|-----------|-----------------------------|----------------------------|
| Addison & Ozturk (2012) | 2 | 1970-2008 | -0.22 to -0.05 | Working Paper |
| Bazen & Benhayoun (1995) | 4 | 1972-1988 | -0.44 to -0.04 | Book chapter |
| Bazen & Martin (1991) | 4 | 1963-1986 | -0.23 to -0.06 | OECD Economic Studies |
| Bazen & Skourias (1997) | 5 | 1980-1981 | -0.94 to -0.04 | European Eco. Review |
| Benhayoun (1994) | 12 | 1968-1991 | -0.47 to -0.05 | Intern. Journ. of Manpower |
| Dolado et al. (1996) | 8 | 1985-1989 | -0.85 to +0.44 | Economic Policy |
| Ducos & Plassard (1992) | 13 | 1970-1988 | -0.52 to -0.18 | Working Paper |
| Fourçans (1980)* | 4 | 1968-1977 | -4.70 to -1.50 | Revue d'Economie Politique |
| Laroque & Salanié (2002) | 1 | 1997 | -0.70 | Journal of Applied Econ. |
| Neumark & Wascher (1999) | 4 | 1975-1997 | -0.39 to +0.18 | NBER WP |
| Neumark & Wascher (2004) | 2 | 1975-2000 | -0.09 to +0.02 | ILR Review |
| Rosa (1981) | 6 | 1963-1979 | -0.68 to -0.17 | Book chapter |
| Skourias (1995) | 8 | 1968-1990 | -0.15 to -0.09 | Book chapter |

Notes: n is the number of estimated elasticities and k is the number of individual studies. Elasticity is here a measure of employment's sensitivity to a change in the minimum wage. For example, [-0.05 to -0.22] means that a 10 percent rise in the minimum wage (SMIC) relative to the average hourly wage will lower the employment rate by between 0.5 to 2.2 percent.

3.2. Basic Meta-Analysis

It is important that the measure of the effect of minimum wage on employment should be comparable within and between studies. In our meta-analysis, we present the results using elasticities for the full sample of 73 estimates. In the minimum wage literature, elasticities are by far the most frequently reported measure of empirical effect. **Table 2** reports the descriptive statistics for this area of research in terms of elasticities.

Table 2 shows that 94 % of the estimates are negative. A significantly negative relationship is frequently observed (71 %), whereas very few observations find a significantly positive relationship between minimum wage and employment (1 %). Hence, the majority of French studies suggest a negative effect of minimum wage on employment.

TABLE 2
Descriptive Statistics of Estimated Elasticities of Minimum Wages

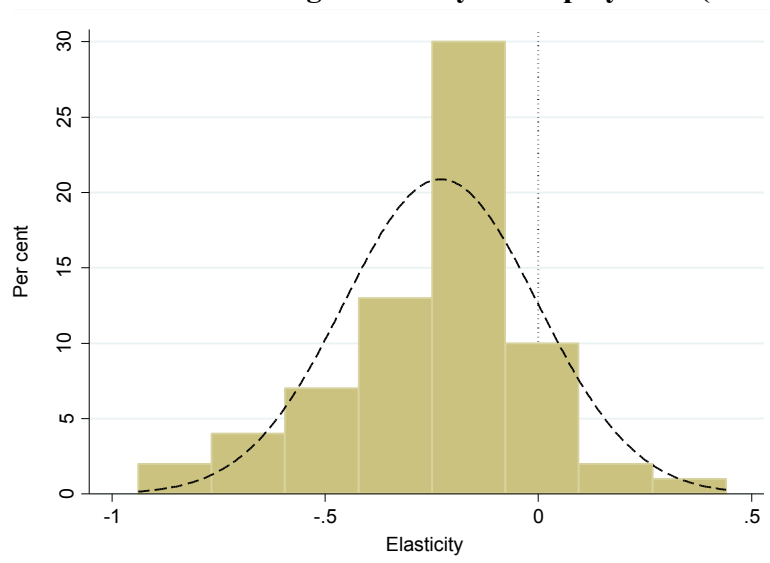
| Statistics | Elasticity | Elasticity | Elasticity |
|---------------------|------------------------------|------------------------------|------------------------------|
| | All studies | without outliers | Youth employment |
| n (k) | 73 (13) | 69 (12) | 54 (10) |
| Un-weighted average | -0.392 (-0.577 to -0.206) | -0.229 (-0.283 to -0.174) | -0.227 (-0.281 to -0.174) |
| Weighted average | -0.109 (-0.143 to -0.073) | -0.106 (-0.129 to -0.082) | -0.103 (-0.122 to -0.083) |

Notes: The unweighted average is the simple average of observations. The weighted average is calculated by using the inverse of variance as weights. n is the number of elasticities and k is the number of studies.

The unweighted average elasticity is -0.392 ($p < 0.001$) or -0.109 ($p < 0.001$) when weighted by the inverse of each estimate's variance ($n=69$). To ensure the robustness of our findings, we present also some descriptive statistics after removing the study of Fourçans (1980) that can be seen as an outlier (the absolute value of the standardized residual being greater than 2.5 for

this study). Column 2 reports the unweighted and weighted averages for this sub-sample of studies. The unweighted and weighted average minimum wage elasticity is now -0.229 (median= -0.17) and -0.106 (median= -0.096) respectively. This is quite close to the average minimum wage elasticity that Doucouliagos and Stanley (2009) found among US estimates (-0.190) and De Linde Leonard et al. (2014) among UK estimates (-0.186). Finally, it seems that the minimum wage in France has a small negative effect on employment. On average, a 10 % increase in minimum wage would result in a 1.06 % reduction in employment.

FIGURE 4
French Minimum Wage Elasticity of Employment ($n=69$)



3.3. Publication selection bias

In Doucouliagos and Stanley's (2009) meta-analysis of the US minimum wage, publication bias was found to be an important factor that can explain the existence of an adverse employment effect. Thus, we decided to examine the possibility of selective reporting issues in the French literature.

Funnel plots

The funnel plot provides a simple tool for visualizing possible publication bias (Stanley & Doucouliagos 2010). Publication bias is a subtle form of bias in empirical research arising when the selection of studies for publication is made based on the statistical significance of results and/or on whether the results satisfy preconceived theoretical expectations (Doucouliagos et al. 2005). A funnel plot is a scatter diagram of all empirical estimates of a given phenomenon in which the size of the estimated effect is plotted on the x -axis against a measure of the estimate's precision (i.e. the inverse of the estimates' standard errors, $1/SE$) plotted on the y -axis. In the absence of publication bias, the effect size should be symmetrically distributed around the 'true' value of the effect. Empirical estimates with less precision are more widely spread at the bottom of the graph, while more precise estimates are found at the top of the funnel.

FIGURE 5
Funnel Graph of Estimated Minimum-Wage Effects in France (n=69)

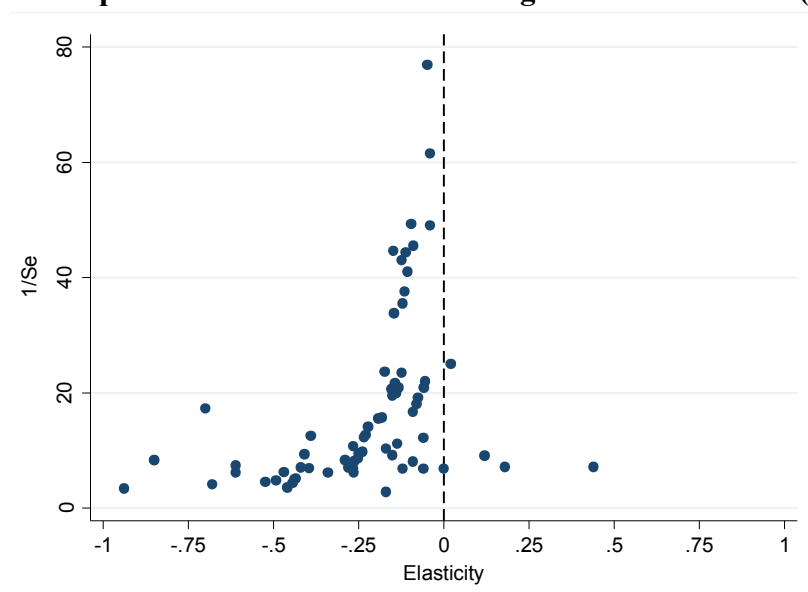


Figure 5 is a funnel plot of 69 elasticities of the effects of minimum wage on employment in France. The funnel plot illustrates the distribution of the results. The funnel plot appears to be overweighted on the left side, suggesting the presence of publication selection. That is, there is some negative skewness in the distribution (the skewness coefficient for **Figure 5** is -3.42). However, funnel graphs are vulnerable to subjective interpretation and must be associated with a more objective test for publication selection bias.

Test for publication selection – FAT-PET Analysis

A more objective test for modelling publication selection involves the simple regression between estimated elasticities and its standard error (Egger et al. 1997; Stanley, 2008). When a publication selection bias is present, there is a positive association between the reported effect and its standard error; otherwise, estimates and their standard errors will be independent (see Stanley & Doucouliagos, 2012, for more details). Hence, we explored the presence of publication bias by estimating the following model:

$$Effect_{ij} = \beta_0 + \beta_1 SE_{ij} + \varepsilon_{ij} \quad (1)$$

where *Effect* is the elasticity between minimum wage and employment, *SE* is the standard error of the elasticity, β_0 and β_1 are parameters to be estimated, *i* and *j* denote the *i*th estimate from the *j*th study and ε are the residuals. Equation (1) is known as the *Funnel Asymmetry-Precision Effect Test*, or *FAT-PET* (Stanley 2005, 2008), and provides a test of funnel asymmetry that is consistent with publication selection bias. If β_1 is statistically different from zero then we can consider that there is publication bias. Estimates of β_0 provide an unconditional measure of the genuine empirical effect of minimum wage on employment corrected for any publication selection bias (Stanley 2008; Stanley & Doucouliagos 2012).

Table 3 provides the estimates of Equation (1). Column 1 presents the results using OLS with robust standard errors. However, since we have multiple estimates from each study, data dependence might be an issue. Hence, column 2 reports the results after correcting for data dependence using clustered standard errors. In column 3, we use weighted least squares (WLS) using inverse of variance as the weight. WLS gives more weight to estimates that are more precise.

The coefficient for standard error (SE) is significant in all three columns (see FAT in **Table 3**). Hence, we can conclude that there is a significant publication selection bias in this literature. Doucouliagos and Stanley (2009) found that publication selection bias dominates reported employment elasticities in the US minimum wage literature. Thus, our results indicate that the French literature contains also substantial publication selection bias. The distortion of the appearance of the funnel plot is clearly confirmed by this formal statistical test. In other words, we find evidence of a negative publication bias in the French literature.

TABLE 3
FAT-PET, Minimum Wage and Employment, Unconditional Estimates

| | OLS Robust (1) | OLS clustered (2) | WLS & Clustered (3) |
|---|---------------------|----------------------|------------------------|
| Intercept: β_0 {PET} | -0.066 (-1.58) | -0.066 (-1.81) | -0.047** (-2.65) |
| SE: β_1 {FAT} | -1.56*** (-4.81) | -1.56*** (-4.42) | -1.83*** (-6.21) |
| n | 69 | 69 | 69 |
| k | 12 | 12 | 12 |
| R^2 | 0.25 | 0.26 | 0.28 |
| Employment effect of a 10% increase in the minimum wage | -0.66% | -0.66% | -0.47% |

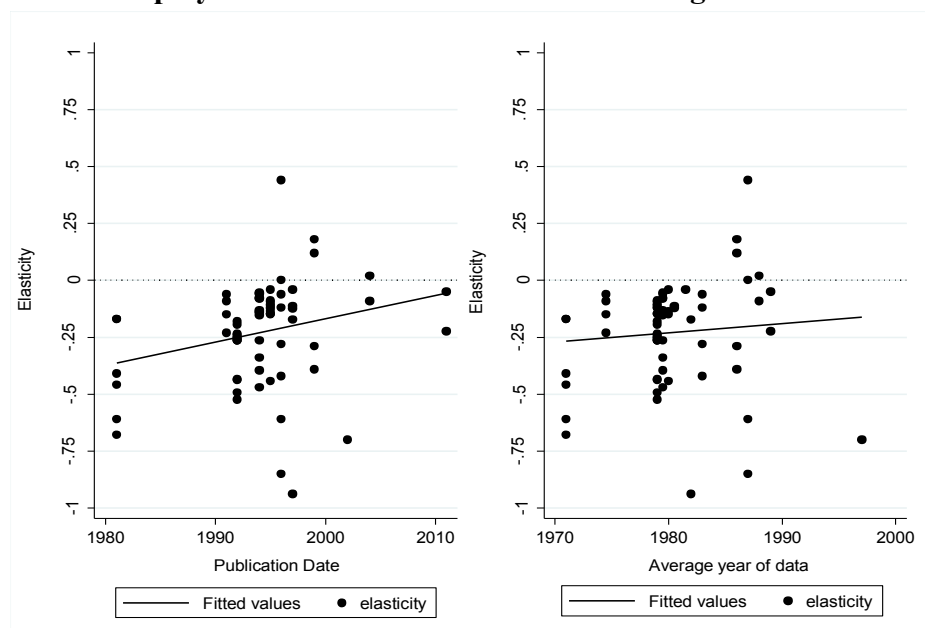
Notes: All columns report estimates of equation (1). The dependent variable is the minimum wage elasticity. Figures in brackets are t statistics. FAT is a test for publication selection bias, PET is a test for the existence of a minimum wage effect corrected for selection bias. *** $p < 0.01$; ** $p < 0.05$.

As estimates of β_1 serve as correction for publication bias (see Stanley & Doucouliagos 2012; 60–61), column 3 in Table 3 reports the weighted meta-average correlation between minimum wage and employment corrected for publication selection bias. The FAT-PET weighted averages suggest a negative and slightly statistically significant elasticity between minimum wage and employment ($elasticity = -0,047^{**}$, $p < 0.05$). Contrary to what the US and UK studies indicate, there is evidence of a modest negative minimum-wage effect on employment in France after accommodating and filtering potential reporting bias.

Chronological ordering of the data

The graphical representation of meta-data using chronological ordering may provide additional insights, as it can capture the evolution of the literature. **Figure 6** presents the evolution of the effects of minimum wage on employment. The horizontal axis indicates the reported effects in chronological order. A simple linear trend line can be fitted to this area of research and shows a rise in the reported elasticities of employment on minimum wages. This upward trend potentially has an important economic interpretation.

FIGURE 6
Time Trend of Employment Elasticities for Minimum-Wage Raises in France ($n=69$)



One can argue that minimum wages has less and less impact on employment over time. However, these results may be also due to studies and data improving over the years. The publication trend may mimic unobservable changes in the research design, the data and/or econometric techniques over the years. For instance, studies accounting for the endogenous selection are comparatively recent. Although these chronological graphs help us to identify trends and path dependencies among empirical findings, such effects can also be captured through a multivariate Meta-Regression Analysis (MRA). Thus, to identify potential differential employment effects, we next turn to multiple MRA (Stanley & Doucouliagos 2012).

3.4. Multiple Meta-Regression Analysis (MRA)

To investigate the heterogeneity and selection of reported research results, the simple MRA model can be expanded to include moderator variables Z that explain variation in elasticities.

$$Effect_{ij} = \beta_0 + \beta_1 SE_{ij} + \sum \beta_k Z_{ki} + \varepsilon_{ij} \quad (2)$$

where $Effect$ denotes the elasticity between minimum wage and employment, SE is the standard error of the elasticities, Z is a vector of moderator variables and ε is the disturbance term. Equation (2) is used to identify the factors that create heterogeneity in reported estimates. Some of this heterogeneity will reflect real moderators, but some will be created by research design choices. Heterogeneity can be identified and quantified by the Z vector in Equation (2). The moderator variables used to explore genuine heterogeneity and heterogeneity introduced by research design choices are listed in **Table 4**.

TABLE 4
Variable definitions and summary measures

| <i>Moderator variables</i> | <i>Definition</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|----------------------------|---|-------------|---------------------------|
| SE | is the standard error of the reported estimated elasticity | 0.10 | 0.07 |
| Toughness | = 1 if the ratio of minimum to average wage is used | 0.39 | 0.49 |
| Lag | = 1 if estimate relates to a lagged minimum wage effect | 0.43 | 0.50 |
| Published | = 1 if estimate comes from a published study | 0.46 | 0.50 |
| Youth | = 1 if estimate relates to youth employment (16-24) rather than adult | 0.78 | 0.42 |
| Female | = 1 if estimate relates to female employees only | 0.26 | 0.44 |
| Time | = 1 if time trend is included | 0.59 | 0.49 |
| Y1980 | = 1 if the average year of data used is after 1980 | 0.38 | 0.49 |
| Panel | = 1 if estimate relates to panel analysis data | 0.04 | 0.31 |
| Double | = 1 if estimate comes from a double log specification | 0.29 | 0.46 |

This list is driven by the type of data available and by debates in the literature. In order to compare our results with those from previous meta-analyses in US and UK, we select the same research dimensions that Doucouliagos and Stanley (2009) found to be relevant for the US research literature. Since several studies include estimates for female (*vs* male), we include controls for estimates relating to male and female (*Female*). We also include estimates relating to youth employment (*Youth*) and compare with adult employment (more than 24 years old). Some of the estimates relate to the lagged effect of minimum wage rises and a *Lag* is included to control for any differences between the contemporaneous employment effects of the minimum wage and the lagged effects of the minimum wage. The effects of including a time trend in the specification are examined through the *Time* variable. A group of estimates come from studies that use panel data. *Panel* is included to control for differences in the type of data used with time-series and pooled cross-sectional used as the base. One variable (*YearEffect*) is also included to control for the inclusion of time fixed-effects. Another one (*Toughness*) is included to control for the use of the ratio of minimum to average wage. Several existing studies have been published in academic journals (*Published*) but a majority of them have come from working paper or book chapters. For the multiple MRA presented in Table 5, we removed outliers defined by an absolute value of the standardized residual greater than 2.5 from the MRA. Fourçans (1980) was then removed from the elasticity data.

Minimum wage and employment elasticities and heterogeneity

The MRA results are presented in **Table 5**. We use cluster data analysis to adjust standard errors for data dependence arising from multiple estimates reporting within studies. All observations are weighted by precision. That is, all models are estimated by weighted least square (WLS). Columns 1 and 2 present the results of applying a general to specific modelling strategy whereby we started with the complete pool of explanatory variables and then sequentially eliminated any that were not statistically significant at the 10% level of significance. An alternative means of dealing with any data dependence is to estimate a multi-level, linear hierarchical model, estimated using restricted maximum likelihood (REML). These results are reported in column 3. The discussion that follows addresses the preferred results in columns 1 and 2. The MRA captures reasonably well the heterogeneity in reported estimates. The MRA explains about 57% of the variation of the elasticities (see the adjusted R-squared, column 1, **Table 5**).

TABLE 5
Meta-Regression Analysis of French Minimum Wage Elasticities

| <i>Moderators variables</i> | Cluster-WLS | Cluster-WLS <i>G-to-S</i> | Multi-Level (REML) |
|-----------------------------|------------------|------------------------------|-----------------------|
| | (1) | (2) | (3) |
| Toughness | 0.04 (1.04) | - | 0.06 (1.17) |
| Lag | 0.07 (1.51) | - | 0.00 (0.00) |
| Published | -0.10* (-1.94) | - | -0.10 (-1.55) |
| Youth | 0.04 (0.80) | - | -0.05 (-0.68) |
| Female | 0.11** (2.99) | 0.05*** (3.38) | 0.10* (1.60) |
| Time | 0.09** (2.49) | 0.07** (2.06) | 0.06 (1.07) |
| Y1980 | 0.06* (2.00) | 0.04** (3.44) | 0.05 (0.89) |
| Panel | -0.34*** (-3.23) | -0.14** (-2.68) | -0.39*** (-2.91) |
| Double | -0.14** (-2.28) | - | -0.11 (-1.37) |
| SE (β_i) | -2.10*** (-5.15) | -2.39*** (-4.99) | -1.76*** (-4.76) |
| Intercept (β_0) | -0.11** (-2.20) | -0.07*** (-5.63) | 2.02 (0.15) |
| <i>n</i> | 69 | 69 | 69 |
| <i>k</i> | 13 | 13 | 13 |
| R^2 | 0.57 | 0.44 | - |

Notes: See Table 3 for variable definitions and summary statistics. Dependent variable is minimum wage elasticities. Figures in brackets are t-statistics using standard errors adjusted for clustering. Columns 1 and 2 use weighted least squares using inverse variance weights ($w = 1/se^2$). Column 1 is the general WLS model, including the full set of controls. Column 3 reports the multi-level (REML) estimates.

Table 5 shows that there is some variation in the estimated MRA coefficients across the estimation approaches but that truly matters is whether there is a publication bias and a genuine minimum-wage effect on employment. Actually, a clear evidence of publication selection remains in this literature. The standard error variable (*SE*) is negative, and statistically significant in all models, suggesting that there is a publication selection bias in this literature. When all of the moderators are taken into account, the minimum wage is predicted to have a negative effect on employment (-0.07; $t=-5.63$ $p<0.01$). Overall, it seems that a little adverse minimum-wage effect (-0.07 %) remains after publication selection is filtered from the reported estimates in France (see β_0 in columns 1 and 2).

The MRA models also indicate that several variables are important in explaining the heterogeneity of the reported elasticities. Our results indicate that, on average, panel datasets produce larger negative effects of minimum wage on employment. That is, panel exaggerates the negative impact of minimum wage on employment. In other words, studies using panel datasets (and controlling for fixed-effects) report a negative effect of minimum wage on employment more often than studies using pooled cross-sectional data or time-series data. A second robust effect is seen in *Female*. Measuring the minimum wage for women reduces the estimated adverse employment effect. It seems that women employment is less affected by the minimum wage level. Another finding is that the effects of minimum wage on employment appear to be time-varying, as suggested in **Figure 6**. The positive coefficients on *Y1980* indicate that the elasticity seems to be less negative in the 90s than it was in the 80s and 70s. In other words, studies using data from the 1990s have a higher propensity to exhibit an insignificant or positive relationship between minimum wage and employment. This may be a direct consequence of the policy implemented since the beginning of the nineties, (see section 2.3 above) reducing payroll taxes to compensate the potential negative impact of minimum

wage hikes on employment - we will also come back to this issue below¹³. Specification of the econometric model appears to be important. *Time* has a positive and statistically significant coefficient. Thus, studies that control for time trend (time dummies) find that minimum wage has a smaller negative impact on employment. Finally, to a lesser extent, articles published in peer-reviewed journals have a significantly greater employment effect, increasing negative elasticity by 0.10. In other words, unpublished studies report a negative effect of minimum wage more often than studies published in peer-reviewed journals (see Column 1). In addition, studies using a double log specification report a negative effect of minimum wage.

The MRA coefficients can be used to calculate a meta-average effect of minimum wage on employment. The meta-average is the best estimate of the effect that emerges from the existing literature (Askarov & Doucouliagos 2013). We made two assumptions in order to construct the meta-average: first that the MRA variables are able to capture the effect of misspecification bias; second that we need to select which MRA variables to include in the MRA estimation. There are consistent theoretical reasons for believing that all of the variables identified by the MRA as significant should be introduced in a well-specified econometric model. The meta-averages are calculated using a linear combination of the MRA coefficients. We also computed the 95% confidence intervals. These results are reported in **Table 6**.

TABLE 6
MRA, Estimated Effect of Minimum Wage on Employment

| | Estimated and corrected elasticities |
|------------------------------------|---|
| (1) All studies | -0.046 % (-0.096 to +0.004) |
| (2) All studies, published | -0.031 % (-0.067 to +0.005) |
| (3) All studies, young employment | -0.046 % (-0.098 to +0.006) |
| (4) All studies, female employment | -0.020 % (-0.135 to +0.096) |
| (5) Panel studies | -0.064 % (-0.227 to +0.098) |

Notes: Cells report estimated elasticities of minimum wage. Figures in brackets are 95% confidence intervals.

When all studies are taken into consideration, the effect of minimum wage on employment is negative but not statistically significant at the 5 percent level (row 1). Our best estimate of the elasticity is -0.46% with a confidence interval of -0.96% to $+0.04\%$. (for a 10% rise in the minimum wage). That is, taking all the evidence together, it appears that, on average, minimum wage has a weak negative effect on employment in France. Minimum wage appears to have no discernible effect on employment, once the type of publication is taken into account (row 2). Similarly, it seems that the effect of minimum wage is not statistically significant when the primary studies use panel data and fixed effects models (row 5).

3.5. Does minimum wage finally reduce employment in France? Looking for alternative and more credible evidence

Our meta-analysis of the French minimum wage research literature finds little evidence of an adverse employment effect, once the effects of publication selection are removed. Overall, a 10 % increase in minimum wage would result in a 0.5 % reduction in employment, suggesting an even smaller effect than in the US. Our MRA identifies several factors that affect the magnitude of the minimum wage elasticity. Estimated employment effects are dependent upon research choices and time. Most of the French empirical studies up to the mid-nineties used aggregate time-series data, even though their limitations are well-known, in the line of

¹³ Another potential explanation could be that the minimum impact may not be linear, elasticities being maybe higher for big hikes in the minimum wage (such as those during the 1970s up to the beginning of the 1980s, see Figure 1 above).

research work done in the U.S. during the same period, and because research access to French micro-data was extremely limited until the 1990s.

At the end of the nineties, a series of studies conducted by John M. Abowd and his French colleagues (1997, 1999, 2000) used a panel data set on employment status and earnings for men and women in France to see how individuals are affected by real increases in the minimum wage conditional on their location in the earnings distribution. More precisely, using the two years Labor Force Survey panel, they study the probability that an individual is employed at the date $t+1$ given his/her wage rate relative to the SMIC at date t . They find that individuals with real wage rates in period t that are between the real minimum wage in t and the real minimum wage in $t+1$ have much lower subsequent employment probabilities than individuals paid real wages in period t that are marginally above the period $t+1$ real minimum wage.¹⁴

TABLE 7
Studies Using Conditional Logit Analysis ($n=8$; $k=3$)

| Authors/year of publication | No of estimated elasticities | Period | Main results (elasticities) | Outlet |
|---|------------------------------|-----------|-----------------------------|--------|
| Abowd, Kramarz & Margolis (1999) | 2 | 1981-1989 | -1.29 to -0.97 | NBER |
| Abowd, Kramarz, Lemieux & Margolis (1997) | 2 | 1981-1989 | -2.49 to -1.04 | NBER |
| Abowd, Kramarz, Margolis & Philippon (2000) | 4 | 1990-1998 | -2.28 to -1.30 | IZA WP |

Notes: n is the number of estimated elasticities and k is the number of individual studies. Elasticity is here the rate of change of employment probability for a 1% increase in the real minimum wage. [-1.29] means that a 1% increase in the real minimum wage decreases the employment probability of a man currently employed at the minimum wage by 1.3%.

Taken the results of all these studies using conditional logit analysis together, we find that a 1% increase in the real minimum wage decreases the future employment probability of a worker currently employed at the minimum wage by 1.4% (see **Table 8**). These results contrast clearly with the results from other French studies which are based on aggregate time-series data (-0.5%, see above). Since there are some reasons to prefer panel analyses over those using pooled cross-sectional data, our results suggest that a 1 percent increase in the minimum wage would reduce men and women employment in France respectively by 1.2 to 1.7%.

TABLE 8
Estimated Elasticities of Minimum Wages in Studies Using Conditional Logit

| Elasticities | Un-weighted average | Weighted average |
|--------------|---|---|
| Male | -1.93 % (-2.81 to -1.06) | -1.74 % (-2.61 to -0.87) |
| Female | -1.21 % (-1.62 to -0.80) | -1.17 % (-1.60 to -0.75) |
| All together | -1.57 % (-2.04 to -1.11) | -1.36 % (-1.74 to -0.98) |

Notes: The unweighted average is the simple average of observations. The weighted average is calculated by using the inverse of variance as weights. $n=8$ elasticities.

¹⁴ The decrease in probability is higher and more significant for men than for women. Concerning Youth, they find that 25-year old men whose wages were in year t between the two minima and who are no longer eligible in year $t+1$ because of their age for specific employment contracts on which they were paid under the minimum wage rate (see section 2.3 above) are dramatically affected by the minimum wage increases.

3.6. Taking into account the differential payroll tax subsidies

One striking feature of the panel of the French empirical studies we reviewed so far is that almost of all them were carried out before the 2000s, most often with data ending in the beginning of the 1990s for the most recent. The main reason may be that measuring the impact of the SMIC became (even) more difficult from the mid-nineties with the introduction of the payroll tax subsidies, as these subsidies changed through time, because of the numerous parametrical changes of the system (see section 2.3 above).

Using the same methodology as Abowd et al. (1999) comparing the year-to-year employment probability of low-paid workers according to their location in the wage distribution, Kramarz and Philippon (2001) were the first to tackle this issue. They investigated for the period 1990-1998 the effects of changes in the minimum wage total labor costs, by capturing the impact of both the changes in minimum wage and the changes in payroll tax subsidies at the minimum wage level, under the form of employers' social contribution exemptions, (see above section 2.3)¹⁵. The conclusion of their study is that, overall, a 1% increase in the minimum cost induces a 1.5 % increase in the probability of job loss. But they notice that the overall impact on the labor market is small, as the group under study (i.e. the workers whose wage cost in year t is between the minimum wage cost year t and the minimum wage cost year $t+1$) represent only 3 to 4% of the workforce

From the end of the nineties, many French empirical works tried to estimate the impact of payroll tax subsidies on employment, with a wide variety of methodology - simulations with general equilibrium models, estimations from macro-econometric models, estimations based on micro-data using differences-in-differences or regression discontinuity designs...- and a wide variety of results concerning the magnitude of the positive effects on employment (see Ourliac and Neveu, 2012, for a survey). Some of these studies allow to estimate the potential impact on employment of a reduction of the labor cost at minimum wage level. One of the most recent and illustrative is the one of Cahuc, Carcillo and Le Barbanchon (2018), based on natural experiment. In December 2008, the government introduced for one year (i.e. until December 2009) a specific payroll tax subsidy for new hires targeted at firms of less than 10 employees called "zero social contributions" ("*zéro charges*") consisting in reducing to 0 the employers' social contributions paid at minimum wage level¹⁶. Using a difference-in-differences strategy - by comparing the evolution of employment in (eligible) firms with initially 6 to 9 employees and in (non eligible) firms with initially 10 to 14 employees -, they find high elasticities¹⁷.

Overall, to conclude, studies based on micro-data and using differences-in-differences methods tend to find higher and more statistically significant elasticities than the studies based on aggregate time-series data which were prevalent up to the mid-nineties. Nevertheless, it is noteworthy that we have no direct evaluations of the employment impacts of minimum wage increases in France since the end of the nineties.

¹⁵ As also pointed out in section 2.3., an additional difficulty for estimating the impact of the minimum wage increases is that many Youth benefit from specific employment contracts offering also public subsidies. For this reason, the authors chose to exclude all workers of less than 25 years old holding these kinds of employment contracts.

¹⁶ The labor cost was reduced by 12% at the level of the minimum wage, decreasing in linear fashion as the hourly wage level rose up to 1.6 times the minimum wage.

¹⁷ They find an employment elasticity of about -4, that they explain by the fact that the measure was targeted at low wage workers in the context of a high minimum wage and high unemployment, but also by the fact that the hiring credit was only for hires. If the measure had concerned all jobs instead, the corresponding elasticity of employment would have been about -1 according to their estimates (the 95% interval confidence being [-1.5, -0.5]).

4. Assessing the other labor market outcomes

4.1. The SMIC and the wage-fixing system

The interplay between the minimum wage and collective bargaining over wages at industry and firm levels

More than 95% of employees are covered by a collective agreement or a specific employment status (such as civil servants in the public service) in France - one of the highest rates among OECD countries. French wage fixing system is characterized by the complex interactions between the SMIC and the pay-scales set by these collective agreements at industry level for most of them. These wage scales rely on collectively bargained minimum base wage floors (BMWs) at different occupational levels¹⁸. At the time they are bargained, the BMWs for the jobs at the lowest end of the job evaluation schemes - i.e. unskilled blue collars and clerks - cannot be lower than the legal minimum wage (i.e. the SMIC). But as the latter increases every year, it may overtake the lowest BMWs. In this case, the lowest BMW does not apply anymore, as workers cannot be paid below the legal minimum wage. But there are nevertheless potential negative consequences for the worker. First, in terms of flatter wage career, as during the first years of service, the employee may climb the pay-scale but without any effective increase in his/her base wage as long as the corresponding BMW remains lower than the SMIC. Second, in terms of lower total compensation, as several premiums and bonuses that may come on top of the worker's base wage are calculated as percentage of the BMW, not of his/her *effective* base wage.

During the 2000s, a high share of industry-level collective agreements' pay-scales had their lowest BMW under the SMIC – more than 50% in 2005 (Gautié, 2010), after the big hike in the SMIC induced by the consequences of the "35 hours" weekly working time law (see also above). This share declined drastically during the following decade, as only 28% of the industry collective agreements in the metal industries, 18% in the construction, building and public works industries, and 12% in the other industries had their lowest BMW still below the SMIC at the end of 2015. Every year, the National Collective Bargaining Commission (NCBC) – which includes representatives of both the state and the social partners (see above section 2.2) – scrutinized the collective wage agreements in all industries and tended to point out the industries in which the lowest BMWs were under the SMIC. The work of the NCBC was based on the annual reports provided by the Ministry of Labor on the development of pay scales fixed by industry collective agreements. The latter has indeed been very active in stimulating industry collective bargaining over low wages. Since 2005, an increasing number of industry-level tripartite committees have been put in place, in which a representative of the Ministry of Labor plays as a mediator between trade-unions and employer's organizations that have failed to reach an agreement¹⁹. Financial incentives were also implemented: in 2008, a law was introduced that threatened the firms in the industries in which the lowest BMWs (of the industry collective agreement) were below the SMIC to see their social contributions exemptions calculated as a percentage of these BMWs, rather than as a percentage of the SMIC.

But these issues may be taken as a symptom that in fact the main problem is that the statutory minimum wage crowds out collective bargaining. In “coordinated market” economies (as labeled by Hall and Soskice's, 2001) such as Austria, Denmark and Sweden there is no statutory national minimum wage, and trade-unions are opposed to it²⁰. In both "liberal

¹⁸ Bonuses, premiums (such as the seniority premium) and other fringe benefits are not included in the *base* wage.

¹⁹ In 2005, up to 88 of such mediation committees were put in place (Avouyi-Dovi et al., 2013).

²⁰ It was also the case in Germany until the early 2000s.

market economies" (such as the USA or the UK), and "state led" economies (such as France), legal minimum wages have been introduced. The weakness of collective bargaining in those countries may appear as the main cause, a legal minimum wage playing as a necessary substitute. But conversely, a high minimum wage and a very active minimum wage policy –as witnessed in France since the end of the 1960s - may have contributed to "crowd out" collective bargaining.

This "crowding-out" hypothesis has been put forward by Aghion, Algan and Cahuc (2010) both theoretically and empirically. Relying on an across-country index of state regulation of the minimum wage, intending to measure the degree of constraint that binds collective and individual wage bargaining²¹, they found a negative correlation between state regulation and both the unionization rate and the quality of labor relations. France has – by far – the highest minimum wage state regulation index, the lowest unionization rate and the lowest indicator of "cooperative labor relations"²². One may think that these correlations are not very surprising. In countries where, for historical reasons, labor relations tend to be bad and unions to be weak, a legal minimum wage has been introduced as a substitute, as mentioned above. But the authors argue that the causality may be the other way round: state regulation may crowd out the possibility for workers to experiment with negotiations and learn about the true cooperative nature of participants in the labor market, and may lead to a "bad" equilibrium, with distrustful labor relations and low unionization. They find some empirical evidence of this reverse causality when analyzing the diversity of minimum wage legislation between states in the USA: between 1997 and 2007, the states that implemented the highest increases in minimum wages were on average those that experienced the highest decrease in the unionization rate.

Concerning more particularly wage bargaining in France, Ayoubi-Dovi, Fougère and Gautier (2013), using a unique administrative data set containing precise information on collective wage agreements observed at the industry level and at the firm level over the period 1994-2005, have highlighted some of the interactions between the SMIC and the collective agreements. They found that the higher the percentage of workers paid the SMIC in an industry and a geographic area, the lower the probability of firm level agreements - meaning that firms rely more on the industry level agreements²³. At the industry level, they found a reverse correlation: the highest the share of minimum wage workers in the industry, the highest the frequency of wage bargaining, but mainly to adjust BMWs after SMIC increases. This result is compatible with the "crowding-out" hypothesis. They also show that annual increase of the SMIC has a significant impact on the industry-level and the firm-level bargaining calendars. Overall, the authors conclude that the legal minimum wage plays a key role in shaping collective bargaining on wages in France²⁴.

²¹ The index is built from ILO and OECD databases. The measurement of the stringency of minimum wage legislation takes into account the existence of legal statutory minimum wages and the degree of extension of BMWs negotiated in industry collective agreements, as well as the degree of dispersion in the minimum wage across ages, qualifications, regions, sectors or occupations. Beyond stringency, the index also takes into account the minimum wage level (that is, minimum wage over median wage ratio).

²² The index is based on the responses of a representative sample of executives to the following question in the *Global Competitiveness Report* survey: 'Are labour/employer relations generally cooperative?'; responses may vary from 1 (strong disagreement) to 7 (strong agreement).

²³ They find that industry-level agreements are more likely to cover small firms and to be binding for low-paid workers, whereas firm-level agreements concern larger firms and higher paid workers. Note that until 2017, firm-level agreements could not be less favorable than industry-level agreements.

²⁴ This is also confirmed by surveys carried out by the Ministry of Labor. Among establishment of the private sector with at least 11 employees, in 2011, 48% declared that the SMIC increases were a first order determinant of their decision concerning wage increase.

SMIC increases do not impact only the adjustments of the lowest occupational wage-floors: Fougère, Gautier and Roux (2016) analyzed the impact of the SMIC on the BMWs at different occupational levels (over the period 2007-2015)²⁵. They find, that the cumulated real minimum wage variation has a positive and significant effect on the size of the BMWs adjustments; on average, in a given industry, an increase of 1% in the (national) minimum wage in real terms increases wage floors by 0.24 pp. The effect is higher in industries with a high proportion of minimum-wage workers and in construction industries (elasticities of 0.3) than in industries with a low proportion of minimum-wage workers (elasticity of 0.26), and in metalworking industries where the proportion of minimum-wage workers is close to 0 (elasticity of 0.14). However, in all groups of industries, the effect of the NMW is significant, even when the proportion of minimum-wage workers is very low, which suggests the existence of a national minimum wage spillover effects.

The effects of the minimum wage on other wages: measuring the magnitude of the ripple-effect

The increase in the minimum wage may have indeed some (vertical) spillover effects on higher wages. This so called “ripple-effect” (Grossman, 1983) may result from various mechanisms. The increase in the labor cost of low skilled workers may increase the labor demand for higher-skilled workers (substitution effect), and therefore their wage. Other theoretical explanations refer to “efficiency wage” considerations (Grossman, op.cit.): as workers care not only about the absolute but also the relative value of their wage, a decrease in the relative wage of higher paid workers induced by a minimum wage hike may impact negatively their productivity. Eventually, when employers have to compete to attract workers, such as in some search-and-matching models, better paying firms have to increase their wage when the minimum wage is increased to maintain the gap between the two (see Manning, 2003).

The potential ripple-effect was a big concern in France when the minimum wage was first introduced in the beginning of the 1950s. The more powerful trade-union of that time, the communist CGT, considered that the lowest BMWs of all collective agreements pay scale had to coincide with the legal minimum wage, to which all the BMWs of all other occupational levels had to be indexed - meaning an automatic 100% ripple-effect along the entire wage scale. The government was completely opposed to this conception, as it was highly inflationary, and a decree was taken to oppose this kind of indexation²⁶. Still, in the first years of implementation, the first hikes in the minimum wage (in particular in 1951) induced an almost 100% ripple effect Eastman, (1954) – exactly what the government did not want. In addition to the general theoretical explanation, several contextual factors may have contributed to this phenomenon. The freedom of collective bargaining had just been reinstated, and both unions and employers were taking the newly introduced legal minimum wage hikes as a reference. As pointed out by Eastman, (op.cit.: 376), as unemployment was very low, the 1951 hikes were interpreted as "*a sign of official sponsorship for a general wage increase*", and as a consequence, the wages of all workers were increased in approximately the same proportion as the minimum wage. The fear of such a ripple-effect contributes to explain why the government was so reluctant to increase significantly the minimum wage up

²⁵ Their data set contains individual BMWs (defined at the occupation level) in 365 different industries. On average, industry-level wage scales include 21 different wage floors (i.e. BMWs) corresponding to different job occupations.

²⁶ In the same line, the 1970 law also stipulates that formal indexation clauses of wages to the minimum wage in collective agreements are forbidden. This was adopted to limit wage inflation, but also to allow the catch-up process of the SMIC, to reduce the gap between the average wage and the minimum wage that had increased tremendously during previous period (1951-1968) - see Figure 1 above.

to the end of the 1960s - a restrictive policy that induced a stagnation of its purchasing power between 1956 and 1968 (see **Figure 1** above). Another important feature of the period was that the main trade-union confederations were competing to attract skilled-workers and white collars – who were very hostile to any reduction in wage differentials, and therefore, were in favor of a 100% ripple-effect. It is only after 1968 that reducing wage inequalities using the increases in the minimum wage became a priority for both the unions and the government.

In their study on the impact of the national minimum wage variations on the bargained wage floors in industry collective agreements (the BMWs – see above), Fougère, Gautier and Roux (op.cit.) find that it decreases along the wage floor distribution, from 0.46 for wage floors close to the SMIC to 0.16 for wage floors above twice the SMIC, but that the effect is significant all along the wage floor distribution.

Other studies have tried to measure the magnitude of the ripple-effect since the 1990s. Koubi and Lhommeau, (2007) estimated the spillover effects of the minimum wage increases induced by the 35h workweek law (see above) during the period 2000–2005. They analyzed the wage scales (i.e. BMWs) of a representative sample of firms with 10 employees or more. In the short run (3 months), they find some spillover up to a wage level equivalent to twice the SMIC. The elasticity is particularly high for wages just above the SMIC: a 1 per cent SMIC increase induces a 0.38 per cent increase for wages between 1 and 1.1 SMIC, a 0.19 per cent for wages between 1.1 and 1.2 SMIC, and still a 0.07 percent increase for wages between 1.4 and 1.5 SMIC. A year after the SMIC increases, the estimation of the spillover is much more dependent on the specification - in particular if firms' fixed-effects are introduced or not. The elasticity for wages between 1 and 1.1 SMIC ranges from 0.47 to 1.19, and decreases when climbing the wage scale, to a range from 0.31 to 0.49 for wages between 1.4 and 1.5 SMIC. Note that as the dependant variable is base wage, the study does not allow to analyze if substitution may have taken place between base wage and some other elements of compensation (premiums, bonuses...). Using the same methodology and data base, Goarant and Muller (2011) replicated the study adding the 2006-2009 period and found similar results - exactly the same short term elasticity (0.38) for wages between 1 and 1.1 SMIC, but lower elasticities for higher wages²⁷. Differentiating by industries, one interesting result is that the spill-over effect, both in terms of magnitude and in terms of diffusion up the wage scale, is higher in industries with higher share of low wage workers. Concerning the timing of the spillover, that can be measured by introducing time lags, they found it is concentrated during the two first quarters following the minimum wage increase for wages between 1 and 1.1 SMIC, while higher wages increase later. This lag means that there is a higher wage compression in the short run (two quarters) than in the medium run (four quarters).

More recently, Aebarhardt et al. (2016) have used a more sophisticated methodology to cope with two issues. First, there is an endogeneity problem in the identification of the impact of the minimum wage on other wages, as when the minimum wage is the same for all employees (as it is the case in France), it is generally impossible to distinguish what is due to its specific increase or to any wage trend or other cyclical effect. This is all the more the case in France that there is an indexation mechanism linking the minimum wage to the average wage of blue collars (blue collars and clerks since 2013). To cope with this issue, their identification strategy relies on a unique setting that created an exogenous change in the minimum wage revaluation rule that occurred in France in the early 2000s. The gradual application of the "35

²⁷ In particular the elasticity for wages between 1.1 and 1.2 SMIC is only 0.13 as compared to 0.19 in Koubi and Lhommeau (2007).

hours laws" resulted in the *de facto* coexistence of several minimum wage levels²⁸. These levels were forced to converge to one single level between 2003 and 2005 resulting in exogenous variations of these different levels - providing therefore a natural experiment. The second methodological issue relates to the modeling of the overall distribution of earnings. The authors chose to use an unconditional quantile regression method²⁹ to evaluate the impact of the minimum wage on the earnings distribution. For this specific period, they found that an increase in the minimum wage lead to significant but decreasing effects on the earnings distribution up to the seventh decile for men and up to the fifth for women. After one year, the elasticity of the first decile (even if it is very close to the SMIC) is only about 0.5. In the same line, also using a quantile regression method on more recent years (2007-2012, based on EU-SILC data) but with a less sophisticated identification strategy, Arpaia and Van Herck (2017) found that a one percent increase in the minimum wage increases wages in the lowest decile of the distribution by about 0.6%. The impact declines over the wage distribution and disappears from the eighth decile.

Due to the specific mechanisms of indexation mentioned there is a potential circular causality between the increase in the SMIC and the increase in other wages, as the “push” pressure (from the minimum wage to other wages) through the “ripple-effect” may be complemented by a symmetric “pull” effect (from other wages to the minimum wage) through the indexation of the minimum wage to the average wage of blue-collar workers (blue collar workers and clerks since 2013). Cette, Chouard and Verdugo (2013) found, over the period from 1970 to 2009, that the impact of the SMIC on the average wage of blue collar workers was strong (a long term elasticity of about 0.34). They also found some empirical evidence of circularity between the average wage and the SMIC.

4.2. The impact of the minimum wage in terms of wage inequalities and wage careers

How much has the SMIC compressed the French wage distribution?

The impact of the minimum wage changes on inequalities has been debated in the United-States. While Lee (1999) has found that the decrease in the real minimum wage was the main determinant of the increase in inequality in the lower end of the wage distribution, the results of Autor, Manning, and Smith (2016) are much more mitigated.

In terms of inequalities, France offers specific features, which may be correlated to its very peculiar minimum wage institution and policy. Several indicators evidence the relative compression of the wage distribution, at least in its lower end. The share of low wage workers (i.e. earning less than two thirds of the median gross hourly earnings) amounted to 8.4% in France in 2014, one of the lowest level among European countries as compared, for instance to 9.4% in Italy, 14.6% in Spain, 18.5% in the Netherlands, 21.3% in the United-Kingdom and 22.5% in Germany³⁰.

But the most striking feature is that while the interdecile ratios (P90/P10 and P50/P10) have increased in most OCDE countries from the early 1980s, it is the reverse in France. In a

²⁸ As mentioned above firms were required to maintain the monthly wage of their minimum wage workers when adopting the 35 hours weekly working time. During this period, so-called monthly Guaranteed Wages (GMR) - corresponding to the current monthly minimum wage - were introduced to maintain the monthly wage of the employees at minimum wage despite the lower number of hours worked (i.e. 35 hours a week instead of the previous 39 hours a week). Each year, during five years (between 1998 and 2003), a new GMR was created for the firms that shifted to 35 hours that year. After five years, it had indeed resulted in the *de facto* coexistence of six levels of (hourly) minimum wage.

²⁹ Proposed by Firpo, Fortin, and Lemieux (2009).

³⁰ Source: Eurostat data, 2017. According to OECD data, the share of low wage workers was 24.9% in the United-States the same year.

longer perspective, the contrast is even higher when compared to the United-States and the United-Kingdom. In 1964, the P50/P10 ratio amounted to 0.64 in France, a higher level than in the U.S. (0.61) and in the UK (0.39). Forty years later, in 2005, the same ratio had decreased by about one third in France (to 0.42), while it had increased by the same proportion in the U.S. (to 0.83), and by more than 50% in the U.K (to 0.61) - Verdugo et al. (2012). In the case of France, Verdugo et al. (2012) found a strong negative correlation, over the period 1975-2008, between the evolution of the P50/P10 earnings ratio (for the full-time male workers) and the evolution of the SMIC. But the evolution of the SMIC had a very limited impact on the wage compression at the upper-tail of the wage distribution (P90/P50) over the period 1970-2008, that was mainly driven by the increase in the supply of educated workers, which induced a decline in the skill premium (Verdugo, 2014). In their comparative study on the impact of labor market institutions on wage inequality in OECD countries, Koeniger, Leonardi and Nunziata (2007) also point out the role of the minimum wage in France. According to their estimations, change in institutions accounted for a 23% decline in male wage inequalities in France (P90/P10) between 1973 and 1998, an outcome mainly due to minimum wage increases and stricter employment protection legislation over the period.

One consequence of the high relative level of the minimum wage in France is that the differential between the dispersion of the wage distribution and the dispersion of the skill distribution is particularly high when compared to most other OECD countries. To assess the dispersion of the skill distribution, one may refer to the scores in the OECD survey of the *Programme for the International Assessment of Adult Competencies (PIAAC)*. The French highest decile (D9) is only slightly lower (3%) than the average highest decile among OECD surveyed countries, whereas the lowest decile (D1) is 12% lower than the OECD average³¹. (Comité d'experts, 2015: 34-35). This suggests a relatively high skill dispersion, in contrast with a relatively compressed wage distribution.

Did the SMIC have a negative impact on wage careers?

According to the basic human capital theory, a high starting wage (because of a high minimum wage in relative terms) may cause employers to cut back on training, as they cannot compensate its cost by lower wages - see the seminal work of Leighton and Mincer (1981) for some empirical evidence in the U.S. If such mechanism is at play, this should have a negative impact of wage careers. This negative impact may also result from an intertemporal compensation mechanism: employers may try to compensate the high starting wage by flattening the wage career. This means that the wage career may be flatter than the productivity profile resulting from the accumulation of both specific and general human capital with tenure. This is induced by imperfections in the labor market (mobility costs and imperfect information on worker's actual productivity). In this case, the potential impact on human capital accumulation is not necessarily negative.³²

In the French case, in addition to these mechanisms, there is also an institutional specificity that may reinforce the potential negative impact of the minimum wage on wage profiles

³¹ The French D1 is even the lowest, with the United-States one, among the OECD surveyed countries.

³² On the one hand, flatter wage careers may affect negatively the workers' incentive to invest in human capital. But on the other hand, a compressed wage hierarchy may provide an incentive for employers to invest in training as productivity may increase more than wage, if employers are able to extract a rent (i.e. productivity minus wage) because of labor market imperfections (Acemoglu and Pischke, 1999 and 2003). Arulampalam et al. (2004) found no evidence that the introduction of the national minimum wage in the UK reduced the training of affected workers and found even some evidence that it may have increased it. More recently, in the opposite way, Bellman et al. (2017) found a negative impact of the newly introduced legal minimum wage in Germany on the training intensity (defined as the share of trained employees) in establishments affected by the minimum wage, with no evidence that this reduction in training was compensated by an increase in the quality of training.

(Malinvaud, 1998). The system of digressive social contribution exemptions presented above (section 2.3.) may indeed induce a “low wage trap”, because the higher the difference between the wage and the SMIC, the lower the rate of exemptions. Because social contributions increase as a proportion of gross wage when the wage is increased, the employer may be reluctant to offer pay raises to his/her low paid workers. This potential "low wage trap" also results from the fact that when workers who were initially paid at a higher rate than the minimum wage are caught-up by the minimum wage after its increase, their labor cost for the employer is automatically reduced (as the employer's social contributions paid on their wage decrease). This should play as an incentive for the employer to limit the magnitude of the ripple-effect.

Lamentably, we have no empirical evidence from research work on the specific impact of the minimum wage on training in France, nor on its impact on wage profiles. Some studies have tried to measure the potential "low wage trap" induced by the social contributions exemption design, but with diverging results.

Aeberhardt and Sraer (2009) find no evidence of negative impact on the wage increases of affected workers. Focusing on the early period of implementation (1994-1997), they use a difference-in-differences strategy to compare the mean wage raises before and after the cuts between workers below and above the wage threshold of the contribution cuts (i.e. 1.33 SMIC during this period). They show that the wage raises of affected workers have not declined after the implementation of the cuts in social contributions as compared to the ones of unaffected workers. They also use a regression discontinuity strategy comparing wage increases of workers just below and just above the threshold above which the cuts stop, that confirms this result. Nevertheless, this method does not take fully into account the contribution of minimum wage increases to the increases in wages of both the treatment and the control group³³. Lehman et al. (2012) focus on another specific period (2003-2006) during which the system of employer's social contributions cuts was reformed and intensified. They use two-years rotating panels from a base matching the French Labor Force Survey with administrative income tax records. They look at the growth rate of gross labor income along the wage distribution. In line with Aeberhardt and Sraer, op.cit., they find no impact of the social contributions exemptions.

As for Lhommeau et Rémy (2009), they do find some negative impact. They refer to a matching model with wage bargaining to distinguish between two opposite potential effects on wage increases of the social contributions digressive exemptions system. On the one hand, as mentioned above, such a system may play as an incentive for the employer to maintain wage as close as possible to the SMIC. On the other hand, social contributions cuts provide a surplus to be shared between the employer and the employees, depending on the respective bargaining powers. This could have a positive impact on wage increases. They analyse wage increases at firm level, using the same data as Aeberhardt and Sraer, op.cit., but aggregated at firm level. They estimate the impact of several explanatory variables on two dependant variables: the real wage increases, and the frequency of exit from the low wage zone (i.e. the wage zone under the threshold above which social contributions exemptions become null). Minimum wage increases during the period is introduced in the control variables. Two indicators of social contributions exemptions are introduced in the explanatory variables (to check for the two potential effects mentioned above): the ratio (social contributions exemptions / total wage bill) at firm level; and the progressivity implied by the exemptions (measured by the elasticity of total labor cost to gross wage - as a 1% increase in gross wage

³³ Even if the authors try take into account the potential spill-over effects of the minimum wage increase during the period by using estimates based on the results of Koubi and Lhommeau (2007).

induces a more than 1% increase in the labor cost at low pay levels, due to the design of exemptions). Overall, they find that the first indicator has a positive impact on wage growth at firm level (a result compatible with the "surplus" hypothesis). But this impact is more than compensated by the negative impact of the "progressivity" variable - in line with the "low wage trap" mechanism.

4.3. Looking for other channels of adjustment

In the United-States and the United-Kingdom the literature has pointed out the variety of the "channels of adjustments" to the minimum wage at firm level - see for instance Hirsh, Kaufman and Zelenska (2015). The employment effects of the minimum wage may in particular be mitigated (at least in the short run) by its impact on prices, on profits, on work intensity, or because of non-compliance. In the French case, lamentably, we have scarce empirical evidence on these potential channels.

The effects on prices and profits

The potential price pass-through effect of the minimum wage increases has attracted some attention in the recent years (see for instance Lemos, 2008, for a survey, and MacDonald and Nilsson, 2016, for recent empirical evidence in the United-States).

Fougère, Gautier and Le Bihan (2010) is the only French research work to provide estimates of the impact of minimum wage increases on prices by using microdata. They focused on the restaurants industry, where the share of minimum wage workers amounts to about 40%. They use a data base of thousands of monthly prices collected by the French national institute of statistics (INSEE) between 1994 and 2003 to compute the Consumer Price Index. They build a microeconomic non-linear model which accounts both for the infrequency of price adjustments and the size of price changes. This strategy is adopted to better capture delayed effects of the minimum wage on prices and to analyze the aggregation of non-linear pricing rules adopted by heterogeneous agents. They find that a 1% increase in minimum wage induces a 0.08% increase in prices in traditional restaurants and 0.117% increase in fast food restaurants. These elasticities are higher than those found in the United-States, because the share of labor costs in restaurants' total costs is higher in France. The impact is non-linear (as the impact of a 5% shock is slightly lower than 5 times the impact of 1% shock). Concerning the time lags, in traditional restaurants, it is only after 2 years that 75% of the long run effect is completed (while only after 12 months in the fast-food restaurants).

One important channel of adjustment may be firms' profitability. Draca et al. (2011) found evidence that that firm profitability was significantly reduced (while wages were significantly raised) by the introduction of the National Minimum Wage in the United Kingdom. A study on this topic was commissioned in France by the Expert Committee on the SMIC. It was only descriptive, as it tried to correlate the share of minimum wage workers in the firm and some indicators of the firm profitability using cross-section firm individual data. No significative correlation was found. (Comité d'experts, 2015: 55).

Compensating differentials: does the SMIC impact negatively job quality via work intensification?

In the United-Kingdom, several studies have found some positive effect of the National Minimum Wage on global productivity that do not seem to derive mainly from the substitution of capital to labor (Bernini and Riley, 2016; Rizov et al., 2016). However, the

underlying mechanisms are not all clear³⁴. In their study on the impact of minimum wage increases on fast-food restaurants in Georgia and Alabama, Hirsh et al. (2015) found some operational “tightening-up,” with higher employee performance standards and work effort. On this issue also, we have very scarce evidence in France. One French paradox is that while the country has one of the highest minimum wage among OECD countries, both in relative terms (i.e. as compared to the average wage) and in absolute terms (i.e. in purchasing power), it has also one of the lowest levels of wage satisfaction, in particular among low skilled workers³⁵. Case studies in low wage industries report that the low level of wage satisfaction expressed by workers is due to the fact they consider their wage did not compensate for work intensity and poor working conditions (Caroli and Gautié, 2008). Indeed, according to comparative surveys, working conditions seem to be quite bad in France as compared to the other European countries³⁶.

One factor of this bad performance may be that employers react to the high minimum wage by increasing work intensity and investing less in job quality³⁷. Some empirical evidence in the United-Kingdom (Arrowsmith et al., 2003) and in the United-States (Reich, et al., 2003, for the San Francisco Airport; Hirsch and al., 2015 in restaurants after the 2007-2009 Federal minimum wage hike) show that introduction of a legal minimum wage or its hikes may induce some work intensification. Askenazy, et al., (2012, compared cashiers in big food retail in France and the United-States, and found that they were more productive (in terms of value-added per worker) in France, and their work intensity was also higher (pace of work, number of products scanned per hour...). Still, their study does not allow establishing a direct correlation with the minimum wage - much higher in France than in the U.S. Overall, so far, we have no direct empirical evidence on the specific impact of the minimum wage on work intensity (and other dimensions of working conditions) and its potential magnitude.

Another open question, concerning also the potential the high minimum wage -low job quality trade-off, is the potential negative impact on fringe benefits. One way to avoid bonuses and premiums in France is to hire temporary agency workers rather than permanent ones. Their share is particularly high in France, even when compared to other countries, in particular at low skill / low wage levels. But many factors may be at play (beginning with the high level of the French employment protection legislation). Here again, we have no direct empirical evidence in France which may allow to conclude there is a causal link with the minimum wage.

³⁴ In their comprehensive report for the Low Pay Commission, Bernini and Riley, op.cit., failed to detect any statistically significant impact on the different channels they explore. Rizov et al., op.cit., pointed towards incentive effects.

³⁵ One may take as an indicator the results of the 2010 wave of the *European Survey on Working Conditions*. One question was about wage satisfaction: “How much do you agree or disagree with the following statements describing some aspects of your job? ... “I am well paid for the work I do”. The proportion of surveyed workers who answered “I disagree” among both low skilled manual workers and low skilled clerks is the highest in France, among the panel of western European countries (Denmark, Germany, Spain, Italy, the Netherlands, Sweden, and the United-Kingdom).

³⁶ This is particularly concerning the dimensions of “intrinsic job quality” which covers skill use and discretion (autonomy...); social environment (social support received in work...); physical environment (physical or posture-related hazards...); work intensity (pace of work...). According to the results of the 2010 wave of the *European Survey on Working Conditions*, the score for France (2.0) was significantly lower than the ones for Germany (4.2), Italy (5.2), Sweden (6.3), the United-Kingdom (6.5), Spain (6.6), the Netherlands (9.0) and Denmark (10.1).

³⁷ In the past 15 years, the increase in the minimum wage was highly correlated with the reduction (imposed by the law) in the weekly working time. Case studies highlighted that workers in some industries made a clear correlation between the implementation of the “35 hours law” and work intensification (Caroli and Gautié, op.cit.).

What about compliance?

A high minimum wage may appear as a dog that barks but does not bite if it is only poorly enacted (Garnero et al., 2015). Compliance has been under-researched in OECD countries, and it is particularly the case in France. Using the Labour Force Survey to compute hourly wages, Caroli and Gautié (2008) found that about 10% of employees (apprentices excluded) had hourly earnings lower than the SMIC. When matching information from the Survey on labor cost and wage structure (Ecmoss, Ministry of Labor) with company fiscal data (DADS administrative data base), in 2013, more than 16% of employees in the private sector (excluding apprentices) appeared as having hourly earnings lower than the minimum wage (Sanchez, 2016)³⁸. The problem is that we do not have empirical evidence to measure the relative contribution of (at least) two explaining factors: measurement errors – in particular concerning actual working time duration - and non-compliance. Some case studies or testimonies from the ground suggest non-compliance does exist in some sector, such as construction, bars and restaurants, taking mainly the form of un-paid overtime. But, so far, we have no element to estimate its magnitude.

5. Concluding remarks

Both the minimum wage setting regime (i.e. the way the minimum wage is designed and determined) and the policy that has been enacted over the past seventy years display strong specificities in France as compared to the other OECD countries. Since the end of the sixties the minimum wage has been conceived as a tool to promote social cohesion under the form of limited wage inequalities. The big increases between 1968 and 1982 have been followed by a much more restrictive policy since then, but the choice not to decrease the monthly earnings of minimum wage workers when introducing the reduction in working time (from 39 hours weekly to 35 hours) at the end of the nineties induced another important hike in the minimum wage.

When assessing the impact of the minimum wage on the labor market, there is a striking paradox: France is probably the OECD country where the statutory minimum wage has played the greatest role since WWII, yet evaluation studies are much less numerous than in other countries such as in the U.S. and the U.K., where minimum wage has played overall a more marginal role.

Among the explaining factors of this paradox, methodological issues due to French specificities can be mentioned. As compared to the U.S, there were much less exploitable temporal variations in minimum wage - with frequent small (real) increases in the minimum wage in France instead of infrequent big increases in the U.S. - and no geographical variations, as the one provided by state level minimum wages in the U.S.³⁹ Moreover, up to the end of nineties, the research access to micro-data was very limited in France. Another key reason may be that the legal minimum wage in France is deeply entrenched in a complex set of labor market institutions and policies (active labor market policies schemes, social contributions exemptions schemes....), which makes not easy to disentangle its proper effects. Another consequence is that because of the interplay between the minimum wage and other institutions, some (many?) effects of the minimum wage measured in France may not be relevant for other countries.

³⁸ On a much smaller sample (the French part of the European Survey on Income and Living Conditions - SILC), Kampelmann et al. (2013) found that about 15% of employees were paid under the minimum wage.

³⁹ There were different minimum wage rates according to geographical zones between 1951 and 1970, but at that time both the data and the econometric methodology were not available to benefit from it.

As in the other countries, the employment effects have attracted most attention. Our meta-analysis of the studies providing employment elasticities - in particular those based on time-series - finds little evidence of a strong adverse employment effect once the publication-bias has been taken into account. Other empirical studies using alternative methodologies suggest that the (negative) employment effect of the minimum wage increases may have been sizeable, at least for the lowest skilled, in particular Youth. Since the 1990s, a voluntary policy of payroll tax reductions has been put in place in order to countervail these potential effects.

In a comparative perspective the French minimum wage remains high, both in relative and absolute terms. So overall one may ask "who pays for it"? Tax payers surely do, by taking in charge part of the social contributions on low wage jobs. And the cost of this subsidy is high - about 1% of GDP⁴⁰. It also means that every hike in the minimum wage induces an increase in public spending through the social contributions exemption mechanism in addition to the direct impact on the public service wage bill which is not negligible.

Some empirical evidence suggests that middle-high skilled workers may also "pay", as the wage distribution is relatively compressed - apparently more than the skill distribution. This could indicate the existence of some "implicit" subsidies (as opposed to "explicit" subsidies through the tax and benefits system) from higher to lesser skilled workers. Consumers may also contribute - as a study shows that minimum wage increases impact sales prices. But they are also impacted by the effect on the structure of relative prices. As pinpointed by Freeman and Shettkat (2002), household activities appeared to be less "marketized" in France than in many other OECD countries. This may have induced a job deficit in industries intensive in low skilled work⁴¹.

Finally, low skilled workers may also pay their share, through higher unemployment, but also flatter wage careers and higher work intensity and overall worst working conditions. But, as noted above, we would need much more empirical evidence on these issues. Overall, on many key issues, we remain with more questions than answers.

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⁴⁰ In 2017, only for the reductions of employers' social contributions. In addition to the latter, during the 2013-2018 period, came the CICE tax credit for wages under 2.5 time the SMIC.

⁴¹ According to Glyn (2005), in 1999, the number of hours worked in the "distribution" sector (i.e. trade, hotels and catering) per person aged 15-64 in the whole population, was 304 in the USA, 239 in the UK, 217 in Germany and only 175-180 in France.

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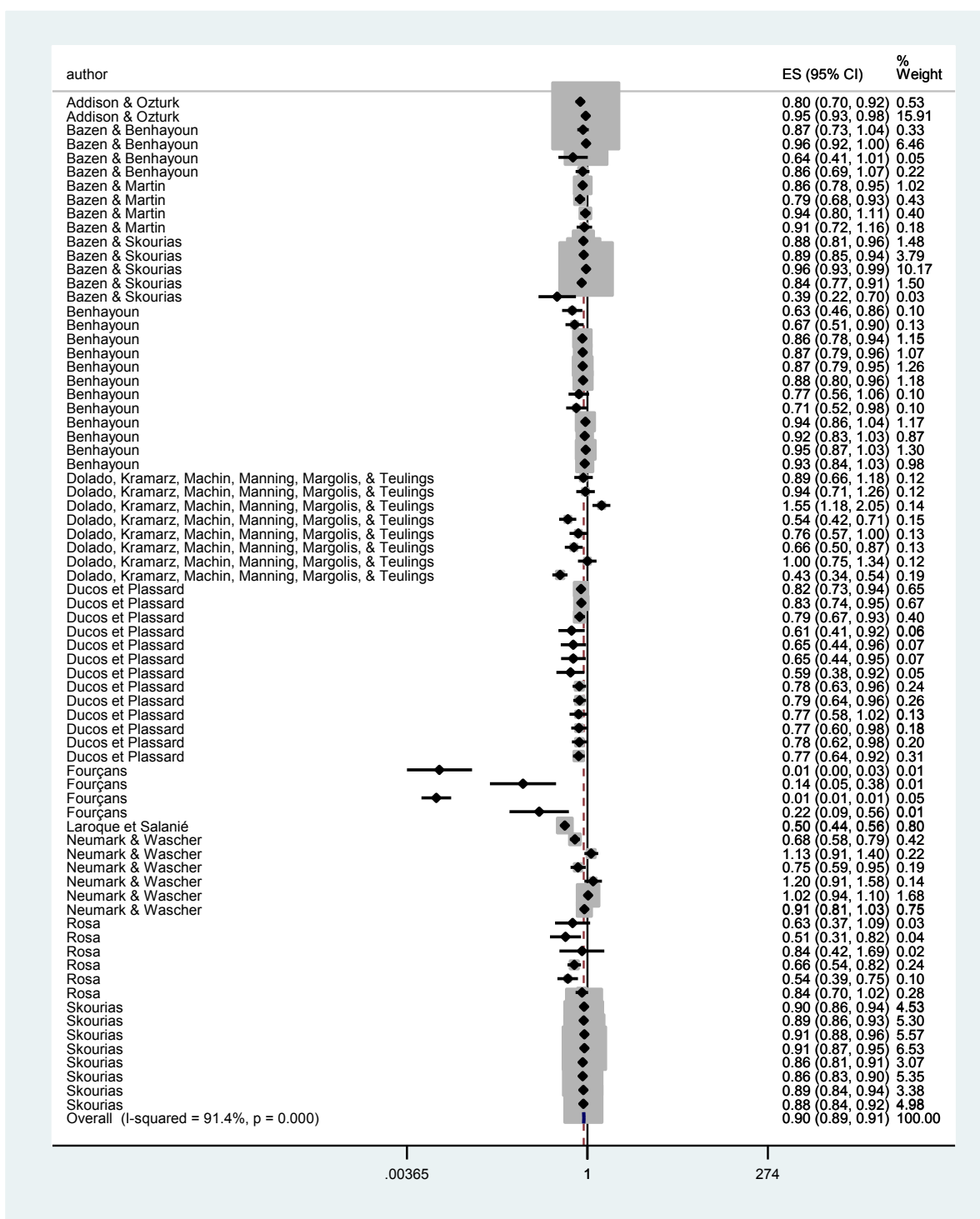
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Appendix TABLE A1

Studies excluded from the meta-analysis organized by the 5 reasons for exclusion

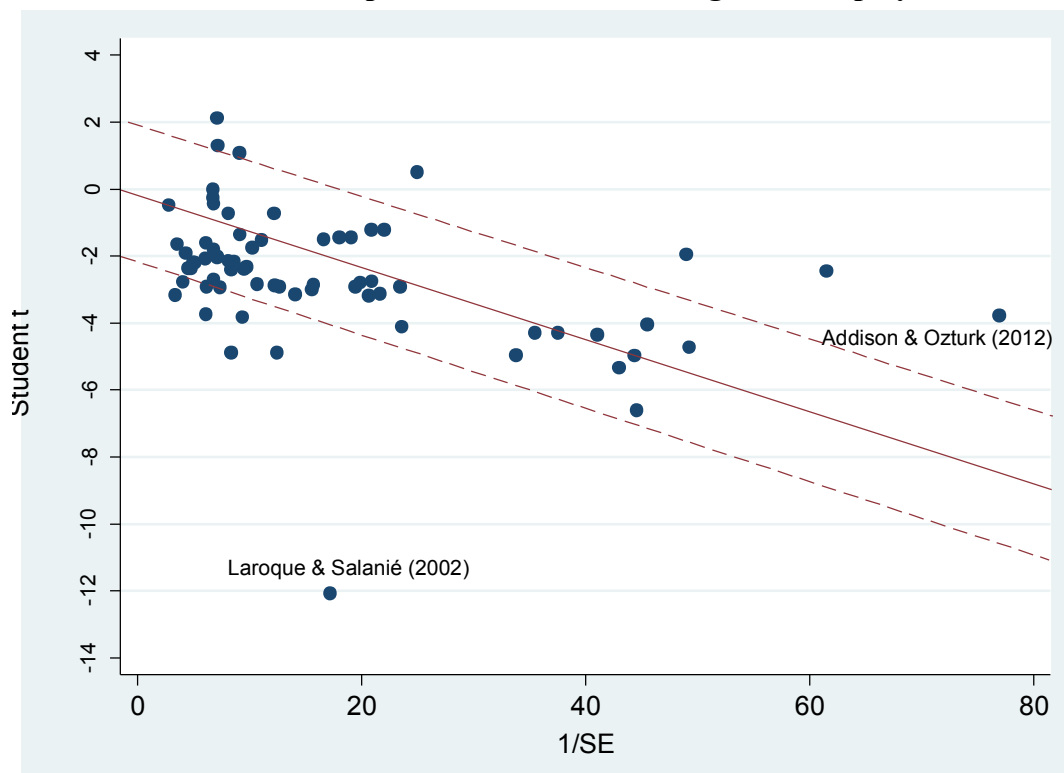
| Reasons for exclusion | References |
|--|---|
| Reviews and essays excluded | <p>Cahuc, P., & Michel, P. (1996). Minimum wage unemployment and growth. <i>European Economic Review</i>, 40(7), 1463-1482.</p> <p>Croucher, R., & White, G. (2011). <i>The impact of minimum wages on the youth labour market. An international Literature Review for the Low Pay Commission</i>. Middlesex University, University of Greenwich.</p> <p>Ghellab, Y. (1998). <i>Minimum wages and youth unemployment</i>. International Labour Organization.</p> <p>Machin, S., & Manning, A. (1997). Minimum wages and economic outcomes in Europe. <i>European Economic Review</i>, 41(3), 733-742.</p> |
| Conditional Logit estimates | <p>Abowd, J. M., Kramarz, F., & Margolis, D. N. (1999). <i>Minimum wages and employment in France and the United States</i> (No. w6996). National Bureau of Economic Research.</p> <p>Abowd, J. M., Kramarz, F., Margolis, D. N., & Philippon, T. (2000). <i>The tail of two countries: minimum wages and employment in France and the United States</i> (No. 203). IZA Discussion paper series.</p> <p>Abowd, J. M., Kramarz, F., Margolis, D. N., & Philippon, T. (2006). <i>Minimum Wages and Employment in France and the United States</i>, CREST.</p> <p>Abowd, J. M., Kramarz, F., Lemieux, T., & Margolis, D. N. (1997). <i>Minimum wages and youth employment in France and the United States</i> (No. w6111). National Bureau of Economic Research.</p> <p>Abowd, J.M. Kramarz, F., Lemieux T. & Margolis D., « Minimum Wages and Youth Employment in France and the United States », in Blanchflower et Freeman (dir.), <i>Youth Employment and the Labor Market</i>, 1999</p> <p>Kramarz, F., & Philippon, T. (2001). The impact of differential payroll tax subsidies on minimum wage employment. <i>Journal of Public Economics</i>, 82(1), 115-146</p> |
| No quantifiable effect size available | <p>Abowd, J. M., Corbel, P., & Kramarz, F. (1999). The entry and exit of workers and the growth of employment: an analysis of French establishments. <i>The Review of Economics and Statistics</i>, 81(2), 170-187.</p> <p>Eastman, H. C. (1954). The Economic Effects of the French Minimum Wage Law. <i>The American Economic Review</i>, 44(3), 369-376.</p> <p>Neumark, D., & Wascher, W. (2004). Minimum wages, labor market institutions, and youth employment: a cross-national analysis. <i>ILR Review</i>, 57(2), 223-248.</p> <p>Neumark, D., & Wascher, W. (2003). <i>Minimum wages, labor market institutions, and youth employment: a cross-national analysis</i> (No. 2003-23). Board of Governors of the Federal Reserve System (US).</p> <p>Neumark, D., & Wascher, W. L. (2007). Minimum wages and employment. <i>Foundations and Trends® in Microeconomics</i>, 3(1-2), 1-182.</p> |
| Unavailable working paper to date | <p>Addison J.T., Chilton J.B. & Zaidi M. (1997) Minimum wages and youth employment in France and the United States in Lewin D., Mitchell D.J.B. (Eds.), <i>Handbook of Human Resource Management</i>, vol.1, JAI Press, Greenwich, CT, pp. 157-194.</p> <p>Bazen, S., G. Benhayoun and N. Skourias (1995). 'The Impact of Minimum Wages in France: A Regional Approach', IERSO, Université de Bordeaux IV</p> <p>Benhayoun, G. (1990). <i>Salaire minimum et l'emploi des jeunes</i>. Centre d'Economie Régionale University of Aix-Marseille III.</p> <p>Martin, J. P. (1983). Effects of the minimum wage on the youth labour market in North America and France. DD Purvis (éd.); <i>Perspectives on macroeconomic performance in the 1970s</i> (Paris, OECD)</p> |
| Data included through other study | <p>Dolado, J. J., Felgueroso, F., & Jimeno, J. F. (2000). The role of the minimum wage in the welfare state: an appraisal. IZA DP n°152, May.</p> <p>Dolado, J. The role of the minimum wage in the welfare state: an appraisal. <i>Swiss Society of Economics and Statistics</i>, 136 (3).</p> <p>Rosa, J. J. (1985). <i>Les effets du SMIC sur l'emploi des jeunes: une analyse bien confirmée</i>. Cahier de Recherche, Fondation Nationale de Sciences Politiques, (24).</p> <p>Rosa, J. J. (1980). Les effets du SMIC sur l'emploi et la participation des jeunes.</p> <p>Skourias, N., 1992, "Un réexamen des incidences du SMIC sur l'emploi, la participation et le chômage des jeunes". Centre d'Economie Régionale, Groupe de Recherches sur l'Internationalisation, la Formation et l'Emploi, No. 7, septembre</p> |

FIGURE A1
Forest Plot of Estimated Results from 13 Primary Studies
on the Relationship Between Minimum Wage and Employment



Note: If the ratio (ES) is equal to 1, there is no relationship between the minimum wage (MW) and employment. If the ratio is >1 there is a positive relationship between MW and employment. If the ratio is <1 there is a negative relationship between MW and employment.

FIGURE A2
Galbraith Plot of Estimated Results from 13 Primary Studies
on the Relationship Between Minimum Wage and Employment



Note: This plot is designed to assess the extent of heterogeneity between estimates in a meta-analysis and thus is used to look for outliers. We expect that 95% of the studies is within the area defined by the two confidence interval lines. (See Galbraith, R. F. (1988). Graphical display of estimates having differing standard errors. *Technometrics*, 30(3), 271-281.)