

Financial Incentives to Work in France between 1998 and 2014

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Abstract – This study looks at incentives to work in France, measured using effective marginal tax rates (at the intensive margin) and effective participation tax rates (at the extensive margin). These show the proportion of an increase in earned income captured by the tax-benefit system, either because the taxes increase or because the benefits decrease. They are calculated using microsimulation based on the Insee survey *Revenus fiscaux et sociaux*. Between 1998 and 2014, incentives to work at the intensive margin rose for very low incomes, and then decrease as incomes rise. Incentives at the extensive margin rose in the first third of the distribution. The profile of the marginal rates changed from a U to a tilde shape. Incentives to work are lower for single people than for couples, but there is very little difference in incentive to work between men and women, except at the top of the distribution, to the detriment of married women.

JEL Classification: D31, H20, H23, H31, I38

Keywords: incentives to work, effective marginal tax rates, taxation, microsimulation

Reminder:

The opinions and analyses in this article are those of the author(s) and do not necessarily reflect their institution's or Insee's views.

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The author would like to thank Alexis Eidelman, Juliette Fourcot and Edith Darin for their contributions at the start of this project, and Laurence Rioux for her attentive proofreading at every stage of this work and her abundant advice. Thanks also to Olivier Bargain, Pierre Boyer, Antoine Ferey, Etienne Lehmann, Marie Reynaud, along with the participants at the Insee DSDS seminar (July 2016), at the 16th Journées LAGV (June 2017), at the 18th Public Economic Theory conference (PET, July 2017) and at the OFCE seminar (July 2017) for their comments on the previous versions of this work.

Received on 5 July 2017, accepted after revisions on 25 May 2018

Translated from the original version: "Les incitations monétaires au travail en France entre 1998 et 2014"

To cite this article: Sicsic, M (2018). Financial Incentives to Work in France between 1998 and 2014. *Economie et Statistique / Economics and Statistics*, 503-504, 13–35. <https://doi.org/10.24187/ecostat.2018.503d.1955>

The French tax-benefit system helps reduce inequalities in living standards through income tax and monetary benefits.¹ However, the various tax-benefit schemes that ensure this redistribution have an impact on incentives to work via the marginal tax rates. These rates correspond to the proportion of an increase in earned income that comes back to the tax-benefit system, either because a tax increase, or because the decrease in a means-tested benefit. In general, the more redistributive the transfers, the higher the marginal tax rates (associated with a marginal increase in income) and participation tax rates (associated with a transition from unemployment to employment) which can reduce incentives to work and distort the behaviour of agents, particularly in their labour supply. For example, a top marginal tax rate increase makes work less financially rewarding and can prompt individuals to reduce their taxable income,² reducing the efficiency of the tax-benefit system.

In addition to income tax, other taxes (social security contributions) and means-tested benefits (minimum income support, housing benefits, family benefits, etc.) alter incentives to work (and potentially the labour supply). In fact, means-tested benefits create high marginal rates, their amount decreasing with an income increase beyond a certain threshold (the marginal rate can reach 100% in the case of minimum income benefits, which decrease by the same amount as the income increases). Degressive means-tested benefits reduce the gains of returning to work for non-workers, who have less incentive to find employment. The inactivity and poverty trap associated with these mechanisms were condemned in many reports at the end of the 1990s in France (CSERC, 1997; Bourguignon, 1998; Pisany-Ferry, 2000) and abroad.³ Subsequently, a range of measures designed to “make work pay” were implemented in the 2000s. These included the creation of two in-work subsidies schemes: the *prime pour l’emploi* (an in-work tax credit scheme) and the *RSA activity* (a part of the minimum income support aimed at returnings to employment). As regards labour demand, taxation was reformed to increase the employment of low-wage earners via policies such as social security contribution reductions and the “CICE” business tax credit. Taxation and redistribution were therefore broadly reformed to encourage employment and combat unemployment (L’Horty, 2007).

The impact of these schemes on incentives and on labour supply has been evaluated by a

number of studies, but most often for one specific scheme (income tax, RSA earned income supplement,⁴ PPE working tax credit,⁵ childcare support, etc.), whereas few studies have examined incentives to work and their changes as a whole. This is the purpose of our study.

An exhaustive summary measure of financial incentives to work at the intensive margin is given by the effective marginal tax rate (EMTR),⁶ with the term “effective” taking into account the integrated analysis of all tax and benefit schemes. The purpose of this article is to present a detailed analysis of EMTR for employed people in France following a slight increase in their earned income. According to Bourguignon (1998) “the statistical distribution of marginal tax rates across the population shows the cost effectiveness of redistribution. It is surprising that this information is not developed, used and disseminated more systematically”. We combine this analysis of incentives at the intensive margin with an analysis at the extensive margin by describing effective participation tax rates (EPTR). The EPTR is the twin of the EMTR, but at the extensive margin: it measures not the impact of a marginal variation in income, but of the transition from unemployment to employment. EPTR are directly dependent on EMTR: a one-off increase in marginal rates at a certain income increases the participation tax rates for higher incomes.

In this study, EMTR and EPTR are calculated for the years 1998, 2008 and 2014 using the Ines microsimulation model. This model is based on the Insee survey on tax-benefit income (*enquête Revenus fiscaux et sociaux*, ERFS) covering some 130,000 individuals, not taking into account possible behavioural responses. Our study includes all social security contributions, income tax, and national welfare benefits.⁷ Two scenarios are presented on the tax incidence of employer contributions. The analysis also takes into account sub-annual profit-sharing schemes, giving a partial or total cumulative of benefits and earned income.

1. The decile ratio of living standards is divided by 4 after redistribution for two thirds, due to benefits (Insee, 2018).

2. See the literature review by Saez et al. (2012) on the topic.

3. Debate on “Making Work Pay”, initiated by the OECD (OECD, and introduction of earned income tax credit schemes in the United States and in the UK (known as EITC and WFTC respectively).

4. See articles on the RMI and RSA in issues 346-347 and 467-468 of *Economie et Statistique*, or Gurgand and Margolis (2008).

5. See for example Bargain and Terraz (2003), and Lehmann et al. (2013).

6. For convenience sake, the term “marginal rates” will sometimes be used in this article.

7. Local taxes (residence and land taxes) and local benefits are not included.

This study is one of a series of EMTR studies based on microsimulation using representative data. In France, these studies were started by Bourguignon (1998) who calculated EMTR based on family budget survey of 1994. He found that the EMTR curve had a flattened U shape, but with peaks at certain deciles. Laroque and Salanié (1999), and Legendre *et al.* (2003) calculated EMTR at the end of the 1990s and obtained similar findings to Bourguignon (a more-or-less U-shaped curve), but they also calculated return-to-work incentive indicators.⁸ Chanchole and Lalanne (2012) gave an overview of EMTR in 2009, calculated on the basis of net earned income and replacement and capital income, but not taking into account social contributions. Ferey (2018, this issue) simulates EMTR and EPTR according to several scenarios and finds a wavy EMTR curve in 2011, in a study on single childless individuals. Lastly, Immervol (2002), Immervol *et al.* (2007), Jara and Tumino (2013), and Leventi and Vujackov (2016) simulated EMTR (and EPTR in the case of Immervol *et al.*, 2007) for several European countries, including France.

Our work makes several contributions to the previous work carried out on France. Firstly, the analysis is carried out at individual level and not at household level, making it possible to study EMTR and EPTR in detail by gender and family configuration. Secondly, we present EMTR quantiles by income percentile. Thirdly, a breakdown of EMTR by transfer shows the impact of each transfer on the level of and change in the EMTR. Lastly, the analysis of the changes that occurred between 1998 and 2014 reveals the impact of the introduction of make-work-pay schemes in the 2000s, which has never previously been done on representative data.⁹

The rest of the article is structured as follows. The first part describes the main tax-benefit schemes and their impacts on nominal marginal rates based on 2014 legislation. The second part details the method used for calculating the EMTR and EPTR, the scope and the data. The third part presents the findings on the distribution of EMTR, their variability, their breakdown per transfer and per family structure and gender in 2014, along with the findings on EPTR in 2014, and a comparison of the EMTR and EPTR curves with those of 1998 and 2008. The analysis concludes with a discussion on the findings, particularly as regards the recommendations of the theoretical literature.

The Tax-Benefit System in France

This section gives a description of the main tax-benefit schemes in France that are explored in the analysis and the nominal marginal rates they incur (in other words, for a 100-euro increase, the amount by which contributions increase or benefits decrease). For further details on the parameters of legislation, the highly local thresholds which create infinite marginal rates, and representations of the marginal rates associated with each scheme for representative agents, see Online complement C1.

Income Tax

The two main characteristics of French income tax is that it is progressive (with marginal rates increasing by income bracket) and family-based (the tax rate scale applies to the net taxable income of the household divided by the number of parts according to the number of members in the household,¹⁰ which gives the household tax allowance known as the *quotient familial*). The amount of tax payable is first calculated as the sum of the tax amounts obtained for each household tax allowance bracket after applying marginal rates, multiplied by the number of parts. In 2014, income tax assessments for 2013 comprised five tax brackets (Table 1).

Various schemes are then added to this calculation (capped household tax allowance, tax relief and credits, etc.), three of which significantly altered the marginal rates¹¹ in relation to the tax scale in 2014: the *décote*, an exceptional tax cut and the income tax threshold.

Firstly, the *décote* slightly altered marginal rates for those at the bottom of the scale. This scheme reduces tax for incomes between the bottom of the income tax scale and a ceiling, offset by an increase in marginal rates. This tax relief measure therefore eliminated the 5.5% bracket in 2014, and created a new 21% bracket in the place of the 14% at the start of the scale

8. But with a different method to ours (see methodology section).

9. This was carried out using representative tax profiles by Hagneré and Trannoy (2001), and Barnaud and Ricroch (2005) who show that there are cases in which EMTR were 100% at the bottom of the distribution in the 1990s, but that there were fewer such cases in the 2000s.

10. For a married couple, the two partners represent two parts, the first two dependents, 0.5 of a part each, and additional dependents, one part each. These parts vary according to the family configuration (people who are separated, single, or widowed).

11. The PPE (in-work tax credit) is taken into account later on. Legendre and Thibaut (2007) showed that income tax in 2006 actually had 16 brackets of marginal tax for a single person.

for a single person¹² (see Pacifico & Trannoy, 2015, and Online complement C1 for more details). Next, an exceptional tax cut, known as *réduction exceptionnelle d'impôt*, was implemented in 2014 for the bottom of the tax scale: this scheme increased the marginal rate after tax relief to 121% in the differential zone (see Figure C1-I of Online complement C1). Lastly, the *seuil de recouvrement* tax liability threshold of 61 euro created a marginal rate that was infinite at local level.

Social Security Contributions

Social security contributions (SSC) are taxes deducted from wages, and can be divided into two categories: employee social security contributions, deducted from the gross salary, and employer contributions, deducted from the “super-gross” salary.

Social security contributions have constant marginal rates per gross income bracket (defined based on the annual social security limit – known as the *plafond annuel de sécurité sociale*, or Social Security Threshold in English (hereafter SST) – and dependent on the type of employment, see Online complement C1). While marginal rates are therefore generally constant, caps make social security contributions degressive for high incomes (particularly after annual social security limits 3 and 4) and result in a low marginal rate.

As regards net contributions and taxes paid by the employer, two schemes in 2014 made them non-proportional, but also partly progressive at the bottom of the labor earning distribution:

- Tax relief on employer contributions for low wages, known as the “*allègements Fillon*”, result in a decrease in social security contribution rates, strictly speaking, for minimum hourly wages, and are degressive up to 1.6 times

the minimum hourly wage. Due to the degressiveness of this tax relief, the marginal rate is higher between 1 and 1.6 times the minimum hourly wage (see Figure C1-III of Online complement C1);

- The CICE is a business tax credit based on the wage bill, created in 2013. It is similar to an employer subsidy resulting in a reduction in employer contributions.¹³ All wages below 2.5 times the minimum hourly wage qualify for this tax credit, from an amount equal to 6% of the gross pay in 2014. Where this threshold is exceeded, the labour cost increases significantly, leading to a very high marginal rate locally (see Table C1-6 of Online complement C1).

General social contributions (CSG, hereafter) and social debt repayment contributions (CRDS, hereafter) are deducted at source on individuals’ earned, replacement and capital incomes. The proportionality of the two schemes implies that the marginal rate for earned income is 8%, even if this proportionality is mitigated by the existence of complete or partial exemption for replacement incomes.

Means-Tested Benefits

Welfare benefits include minimum income benefits, housing benefits (*allocations logement*) and family welfare benefits (*prestations familiales*). Only means-tested benefits give marginal rates that are non-zero: above a certain income threshold, the benefit decreases, often differentially (when the income increases

12. The “*décote*” tax relief scheme multiplied the marginal rate from the first bracket by 3/2 in 2014. It should be noted that in 2015, the “*décote*” tax relief scheme was increased: the applicable ceiling for the calculation was raised from 1,016 to 1,135 euro for a single person, and people with a partner (1,870 euro for a married or civil union couple), and the amount decreasing the amount of tax paid also doubled. As such, in 2015, the “*décote*” tax relief scheme multiplied the marginal rate per bracket by 2.

13. And is treated as such in the *Ines* model.

Table 1
Scale for 2014 Tax on 2013 Incomes

Household tax bracket (<i>quotient familial</i>) (in €)	Marginal tax rate (in %)
0 - 6,011	0
6,011 - 11,991	5.5
11,991 - 26,631	14
26,631 - 71,397	30
71,397 - 151,200	41
151,200 -	45

Sources: French tax code (*Code général des impôts*).

by one euro, the benefit decreases by the same amount), which gives a marginal rate of 100% for the income taken into account. This is the case for minimum income benefits for which the differential zone extends to the amount of the allowance (see Online complement C1 for the amounts). Some benefits have a fixed rate up to a certain level of income and then differential beyond that: this is the case for the special disability allowance (ASI), family supplement (*complément familial*), and the school allowance (ARS).

In the case of minimum income support (RSA), which was created in 2009, and the adult disability allowance (AAH), the impact on marginal rates are moderated by profit-sharing schemes once back at work. Basic income support (RSA *socle*) is topped up by the earned income supplement (RSA *activité*) and therefore becomes degressive and no longer differential (see below). For the adult disability allowance, 20% of any earned income below 0.3 times the gross minimum wage is taken into account, and 60% of any earned amount above that; this results in a marginal rate of 20% then 60% until no longer qualifying for the scheme. These work incentive schemes (which are partially cumulative) help decrease marginal rates at the bottom of the distribution. Fully cumulative schemes also help offset all earned incomes for three months if the person returns to work, for income support and adult disability allowance.

The calculation for housing benefits is complex because it depends on many parameters (Trannoy & Wasmer, 2013; Bozio *et al.*, 2015; Ferey, 2018). It gives a net-income based marginal rate of zero up to a certain threshold, then of approximately 30% in the degressive zone of housing benefits. Lastly, certain benefits can very occasionally lead to negative marginal rates and infinite rates associated with non-payment thresholds (see Online complement C1).

Work Incentive Schemes: PPE and RSA *activité*

Two in-work subsidies schemes were created in the 2000s to reduce the disincentive to work for the unemployed or low-paid workers:¹⁴ the working tax credit (*prime pour l'emploi*, PPE) in 2001, and the earned income supplement (RSA *activité*) in 2009. These two schemes are merged in the study because, firstly, they aim to increase incentives to work¹⁵ (and were therefore merged in 2016 to form the *prime*

d'activité' earned income bonus) and, secondly, they are closely linked (in practical terms, the PPE working tax credit is calculated net of the RSA *activité*¹⁶ and it is therefore more logical to consider the sum of the two).

PPE is an in-work support scheme in the form of a tax credit, aimed at increasing the gap between unemployed income and earned income. The benefit comprises two parts: a progressive phase and a degressive phase. The first part involves negative marginal rates (from -7.7%), whereas the second involves positive marginal rates (+19.3%) because an increase in revenue reduces the zone in which the PPE applies and therefore its amount.

The RSA *activité* tops up the RSA basic income support scheme which replaced the RMI minimum income scheme in 2009. It is for low-income workers whose resources are below a certain threshold. The RSA *activité* therefore makes it possible to achieve a guaranteed income (fixed amount plus 62% of the earned income) and gives a marginal rate of -62% (on posted income, net of social security contributions and deductible CSG). Therefore the marginal rate associated with the total RSA is 38% (100% for the RSA *socle* less 62% for the RSA *activité*).

Computation of EMTR and EPTR

The conventional method for calculating EMTR and EPTR is to simulate, against a scale, the social welfare benefits and taxes of each household, using a fictional situation in which incomes increase or decrease in relation to an observed situation. This EMTR calculation can be done either with representative agents or with a representative population. However, the analyses of representative agents only gives marginal rates or participation rates according to specific tax profiles and does not therefore give a representative overview of the diversity of family configurations and situations in the labour market: only microsimulation with real data reveals the heterogeneity of the EMTR of individuals with identical incomes. Indeed, in addition to income, the EMTR depends on

14. Redistribution was another reason for their creation.

15. Although they are targeted at the same people: the RSA earned income supplement is more generous than the PPE working tax credit for part-time minimum-wage jobs, almost identical to the minimum wage, and a little less generous beyond that.

16. As the PPE is paid one year after the income considered, the RSA amounts received are known and are therefore deducted.

the characteristics of the people and the composition of their household. The method used is detailed in this section.

Calculation Methodology

The calculation of marginal tax rates and participation rates (EMTR and EPTR) is detailed in Box 1.

Given the relationship between individual earned income and disposable income, it is possible to break an individual's EMTR and EPTR down into a sum of rates associated with different taxes and benefits. This breakdown reveals the contribution made by each group of transfer to the average EMTR and EPTR of a group of individuals.

To estimate the EMTR, the relative or absolute increase in income and its extent must be decided. It was decided to use a 3%¹⁷ relative increase in income declared by people in work, as done by Immervol (2002, 2004) and Immervol *et al.* (2007). This percentage is median in relation to the literature on the subject and corresponds approximately to the average annual increase in pay from one year to the next for the wage earners present both years. The results are similar when considering an increase of 1% or 5% (the main differences are visible at the threshold level).

17. The resulting changes to worked hours, which could affect Fillon tax relief, the CICE and the PPE are not taken into account in this analysis.

Box 1 – Calculation of EMTR and EPTR

Disposable income of the household m to which the individual i belongs is written as:

$$R_m = W_i + W_{-i} - \sum_{j=1}^n T^j(W_i, W_{-i}, Z_m) + \sum_{j=1}^o P^j(W_i, W_{-i}, Z_m) \quad (1)$$

with:

- R_m the disposable income of the household m ;
- W_i the earned income of i (labour cost or gross income);
- W_{-i} the household's income other than the earned income of i (income from other people in the household + capital income);
- $T^j(W_i, W_{-i}, Z_m)$ taxes paid by the household (numbered from $j = 1$ to n);
- $P^j(W_i, W_{-i}, Z_m)$ benefits paid to the household (numbered from $j = 1$ to o);
- Z_m the characteristics of the individuals in the household.

Taking the derivative of the equation (1) in relation to W_i , without considering behavioural responses within the household ($\frac{\partial W_{-i}}{\partial W_i} = 0$), we obtain^(a):

$$\frac{\partial R_m}{\partial W_i} = 1 - \sum_{j=1}^n \frac{\partial T^j(W_i, W_{-i}, Z_m)}{\partial W_i} + \sum_{j=1}^o \frac{\partial P^j(W_i, W_{-i}, Z_m)}{\partial W_i}$$

The EMTR for the individual i is obtained, which measures the proportion of the variation in income captured by the tax-benefit system:

$$\text{EMTR}_i = 1 - \frac{\partial R_m}{\partial W_i} = \sum_{j=1}^n \frac{\partial T^j(W_i, W_{-i}, Z_m)}{\partial W_i} - \sum_{j=1}^o \frac{\partial P^j(W_i, W_{-i}, Z_m)}{\partial W_i} = \sum_{j=1}^{n+o} \text{MTR}_i^j \quad (2)$$

with MTR_i^j the marginal rate of the scheme j .

This EMTR is positive if the variation in income ∂W_i leads to an increase in taxes net of benefits, and is negative in the opposite case (the benefits increase more than taxes)

The EPTR are calculated according as follows:

$$\text{EPTR}_i = 1 - \frac{(R_m - R0_m)}{W_i}$$

with $R0_m$ the household disposable income if $W_i = 0$

$$\text{EPTR}_i = \sum_{j=1}^n \frac{T^j(W_i, W_{-i}, Z_m) - T^j(0, W_{-i}, Z_m)}{W_i} - \sum_{j=1}^o \frac{P^j(W_i, W_{-i}, Z_m) - P^j(0, W_{-i}, Z_m)}{W_i}$$

$$\text{EPTR}_i = \sum_{j=1}^{n+o} \text{PTR}_i^j$$

with PTR_i^j the participation tax rate of the scheme j .

(a) The same result is found by writing the first-order condition in a labour supply model of choice (in which the utility depends on the household's disposable income and on the various incomes within the household, including the individual income from the individual's work i).

The EPTR is calculated by cancelling out the individual's earned income, without simulating unemployment benefits (Box 1).¹⁸ This measures the impact of the resignation or job loss of a person who does not qualify for unemployment benefits and, symmetrically, the return to work of a non-working individual. Unlike a traditional return-to-work indicator,¹⁹ the EPTR calculation makes it possible not to choose which income to attribute to a non-working individual and to give a distribution according to income.

Transfers Taken into Account and Tax Incidence Hypotheses

To choose the initial income and the transfers to be taken into account, it is necessary to hypothesise the incidence of taxes and benefits. In this study, incidence particularly applies for housing benefits and employer contributions for which the official payer/recipient is not necessarily the one who ultimately pays/receives the tax or benefit (tenants or landlords for housing benefit and employees or employers for the employer contributions). Housing benefits were included in the analysis by hypothesising that following a decrease in housing benefit due to an increase in earned income, the landlord does not decrease the rent.

Concerning social security contributions, from a theoretical stance, employer contributions and employee contributions have a perfectly equivalent impact on market equilibrium and ultimately affect employees if elasticity in the labour supply is lower than that of labour demand (Fullerton & Metcalf, 2002), which appears to be borne out by empirical estimates (Blundell & MaCurdy, 1999). However, more recent empirical studies (Saez *et al.*, 2012, in Greece; Lehmann *et al.*, 2013, and Bozio *et al.*, 2017, in France) challenge this finding and show that the employer contributions are mostly borne by the employers in the short term.²⁰

For this study, two scenarios were therefore used: the first, in which the incidence of employer contributions falls on the employers and are therefore not taken into account, and the second where they are taken into account. In the first instance, the initial income of interest is gross income, and in the second, the labour cost. The "real" marginal rate for households probably sits between the two as noted by Bourguignon (1998, p. 41).

This study does not to make a distinction between contributions that are contributive or

those that give entitlement to a replacement income or otherwise. As such, it is implicitly assumed that agents are short-sighted and perceive employer contributions as a tax and not as a future replacement income (pension) or an insurance (unemployment). This study focuses therefore on short-term incentives, not taking into account long-term incentives (more advantageous pension or unemployment benefits).

Lastly, the tax-benefit transfers considered in this study are all those that go from the labour cost (or gross income depending on the scenario) of the individual to the disposable income published by Insee (see Box 2 for details of the schemes), except for replacement incomes and residence tax (due to the difficulty of simulating it). The national benefits not included in disposable income (childcare support (*Complément Mode de Garde*), universal healthcare coverage (CMUC), grants, etc.), local and extra-legal social benefits (nurseries, canteens, social housing benefits, entitlements associated with RSA, etc.), social tariffs, and wealth taxes were not taken into account.

Lastly, it should be noted that this study is different to previous related studies in France because it takes into account²¹ temporary, often sub-annual, fully and partially cumulative minimum income schemes and earned incomes.

Implementing the Calculation based on the Ines Microsimulation Model

We analyse the EMTR and EPTR by microsimulation using the Ines model (Box 3), based on a sample representative of the population (see below). The benefits and taxes of each household are simulated, first in a counterfactual situation, then in a fictional situation²² in which

18. This imputation is in fact impossible using the ERFS as the work status for the last two years, required to calculate employment benefits, is not known. Alternative PTR calculated by reducing earned income by 40% (the average employment benefit being 60% of net income according to Unedic) for all individuals are presented in Online complement C7: the main conclusions are the same but the shape at the bottom of the distribution is slightly different.

19. A description by microsimulation of the financial gains for individuals who return to work can be found for France in the studies by Legendre *et al.* (2003), Laroque and Salanié (1999), Gurgand and Margolis (2008), or compared internationally with representative tax profiles in the study by the OECD (2017).

20. Due to the rigidity of gross income, in connection with collective bargaining and the minimum wage according to Lehmann *et al.* (2013).

21. Using monthly information on the working time of individuals in the French employment survey.

22. In practice, the wage reported in tax declarations is varied. As social security contributions are simulated, it is possible to obtain, for a 3% variation in declared income, the variation in gross income and labour cost and to deduct from these the marginal tax rate.

incomes were modified, to be able to calculate the EMTR and EPTR.

If several people in a household were working, the EMTR and EPTR are calculated for each working individual (increasing the labour cost

of each single person in the household and recalculating the disposable income of the household, in turn). In this respect, this study differs from several other studies which calculate an EMTR at household level alone (Immervol, 2002; Bourguignon, 1998) or for one of the

Box 2 – Transfers Considered in the Analysis

The transfers considered in the analysis are as follows:

- Income tax, net of tax credits and flat-rate tax (*prélèvement forfaitaire libératoire*, PFL), but gross of working tax credit (*prime pour l'emploi*, PPE);
- The PPE working tax credit and the RSA *activité* which have been merged and are different to income tax and minimum income benefits respectively due to their aim to improve incentives to work (see below);
- Means-tested family benefits: birth allowance (*prime de naissance*) and the basic allowance provided by the PAJE childcare scheme, family supplement (*complément familial*), the school allowance (*allocation de rentée scolaire*); and the CLCA stay-at-home supplement (which depends on PAJE payments and therefore indirectly income);
- Housing benefits (for tenant and first-time buyer);
- Minimum income benefits: primarily the basic RSA (income support and Christmas supplement) and adult disability allowance (*allocation adulte handicap*, AAH), supplementary disability allowance (*allocation supplémentaire d'invalidité*, ASI) and pensioners' allowance (*allocation de solidarité aux personnes âgées*, ASPA).
- Social security contributions (CSG, CRDS, the exceptional civil service contribution, and other social contributions on capital income);

- Employee contributions and compulsory self-employed social security contributions (grouped together under the term "employee contributions" for simplicity's sake);

- Net contributions and taxes paid by the employer, composed of:

- Employer contributions toward unemployment benefits, family, sickness and occupational injuries benefits, basic and top-up pension (including Agirc and Arrco); in the case of civil servants, only actual contributions are taken into account, and not imputed contributions (pensions);
- Other taxes and subsidies based on the wage bill: "taxe sur les salaires", firms' tax credit (CICE), transport fund tax (*versement transport*), contribution to the national housing fund (*contribution au fond national d'aide au logement*), invalidity contribution (*taxe de prévoyance*) including the corporate contribution, apprenticeship tax (*taxe d'apprentissage*) and the contribution to apprenticeship development (*contribution au développement de l'apprentissage*), contribution to continuing professional development (*contribution à la formation professionnelle*) and employer participation in construction investments (*participation des employeurs à l'effort de construction*).

Box 3 – The Ines Microsimulation Model

The Ines microsimulation model is jointly managed by Insee and Drees and has been made available freely to researchers since June 2016. It can be used to simulate financial benefits and taxes for a population representative of households in mainland France, based on the tax and benefit incomes survey, *enquête Revenus fiscaux et sociaux* (ERFS).

Based on the ERFS for year N , the incomes in $N + 1$ and $N + 2$ received by a series of households representative of the population in $N + 2$ are extrapolated based on developments aggregated by categories of income and the socio-demographic structure. By applying the legislation of $N + 2$, the microsimulation model can be used to calculate the taxes they pay that year along with the benefits they receive, in order to calculate the standard of living after redistribution.

The main shortcomings relate to local taxes and benefits as well as the wealth tax (*impôt de solidarité sur*

la fortune, ISF). Pensions, unemployment benefits and residence tax are not simulated but are present in the upstream data.

The Ines model gives a relatively good simulation of the benefits and taxes compared to observed values: the vast majority are simulated with less than 10% error, and the most important in terms of quantity with less than 5% (for example, income tax, the CSG and the CRDS, and family welfare benefits). Indeed, beyond the simulation of scales, the Ines model recreates, for each tax or transfer, the appropriate unit for calculating them (individuals, household in the fiscal sense, family according to the CAF family welfare office). Lastly, the model considers different temporalities for the resources.

A detailed description of the model along with the source code are available at <https://adullact.net/projects/ines-libre>.

people in the household (often the main earner or, for example, the head of family for Duclos *et al.*, 2009).

As is the case in nearly all studies on EMTR, no behavioural response (variation in the individual's labour supply or that of their partner) is taken into account here. Lastly, the calculation of the marginal rates is consolidated and does not take into account the time lag in incomes for certain transfers (for example one year for income tax). This gives the contributions of each transfer for a single year (the legislative year under study).

Method for Comparing the Different Legislative Years

This study seeks to describe the EMTR and EPTR for the year 2014, but can also compare previous years: 1998 and 2008. As such, the approach used by Eidelman *et al.* (2013) is applied with a constant population (that of 2014), in order to comment on the developments in legislation and not on the socio-demographic situation. However, to be able to apply this to the population in 2014, the legislative scales from 1998 and 2008 had to be revised: they are increased in this study according to inflation (because they are generally revised according to inflation-related criteria). It should nevertheless be noted that the simulation becomes less sound the older the legislation period.

Data

The French tax and benefit income survey, the *enquête Revenus fiscaux et sociaux* (ERFS),

on which the Ines model is based, compiles socio-demographic information from the labor force survey (LFS), administrative information from the family welfare offices (Cnaf), the pensions offices (Cnav) and the central agricultural social insurance agency (CCMSA) on benefits paid to households, along with details of the income declared to the tax authorities for calculating income tax as provided by the General Directorate of Public Finance (DGFIP). This study used the ERFS 2012 (which included approximately 56,000 households in mainland France and 134,000 individuals), which was aged by two years using the Ines model so as to be representative of the situation in 2014.

This analysis focuses exclusively on individuals receiving positive earned income in 2014, be they employees or self-employed, and regardless of their work time percentage or the length of period they worked over the year. In addition, it is limited to ordinary households (in other words, not collective housing) in mainland France. Lastly, our sample contains 56,712 individuals (28.8 million with weighting) and 35,921 households (18.5 million with weighting).

The median labour cost is 32,800 euro and that of the standard of living 22,300 euro (Table 2). The distribution of incomes of individuals in the sample is slightly further over to the right in relation to that of the entire population, particularly as regards standards of living (median of 22,300 euro in our sample against 20,200 euro, see Argouarc'h and Boiron, 2016). This is linked with the fact that we only took into account working individuals, and their incomes are higher on average than those of pensioners and the unemployed.

Table 2
Distribution of Incomes and Transfers of Individuals in the Sample

(In €)

	Individual labour cost	Gross income	Net income	Contributions	Benefits	Taxes (including PPE)	Standard of living
P10	5,871	4,985	3,726	4,398	0	-454	12,915
Q1	17,407	14,071	11,128	10,862	0	0	17,012
Median	32,794	24,660	20,096	20,026	0	1,171	22,349
Q3	48,119	35,069	28,668	31,502	2,729	3,073	29,594
D90	71,547	50,923	41,451	45,546	6,692	7,334	39,996
Average	38,874	29,011	23,558	23,672	2,132	3,379	25,695

Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

Results

Analysis of EMTR Over the Year 2014

Distribution of the EMTR

The median effective marginal tax rate for working people is 33% in the first incidence scenario²³ (not taking into account employer contributions) and 57% in the second. The distribution of the EMTR reveals 3 main modes at 21%, 31% and 42% (Figure I), which correspond with the marginal rates of employer contributions and the CSG/CRDS (21%),²⁴ added to the rate of income tax (at 0%, 10% and 21%).²⁵ In the second scenario employer contributions, taxes and subsidies needed to be added, which adds two peaks (according to eligibility for Fillon tax relief and the CICE business tax credit) and moves them all to the right: the distribution reveals five modes at 50%, 57%, 59%, 62% and 65%.

In both scenarios, the gap between the first and the last decile is approximately 30 points (between 22% and 53% and between 44% and 73% respectively) and the distribution has few extreme values: only 1.5% of individuals have rates higher than 100% (the majority between 100% and 120%), and 0.2% have negative rates (of which more than two thirds are between 0% and -20%). These very atypical rates can be explained by the effects of thresholds and the

differential benefit schemes presented in Online complement C1.

Variability of the EMTR

Figure II shows several EMTR quantiles according to percentiles of annual individual income. In the two scenarios, the median marginal rate has a wavy shape according to income. In the first scenario, it increases in the first two deciles to reach 42%, then drops as of a third of the distribution, is stable between 1.3 the minimum wage and 2.5 the minimum wage at 32%, then increases. In the second scenario, it is stable below 0.3 the minimum wage at 57%, then gradually increases to just above 1 times the minimum wage to reach 66%, before dropping again to 1.7 the minimum wage, stagnating at 52% and finally increasing again after the annual social security threshold.²⁶

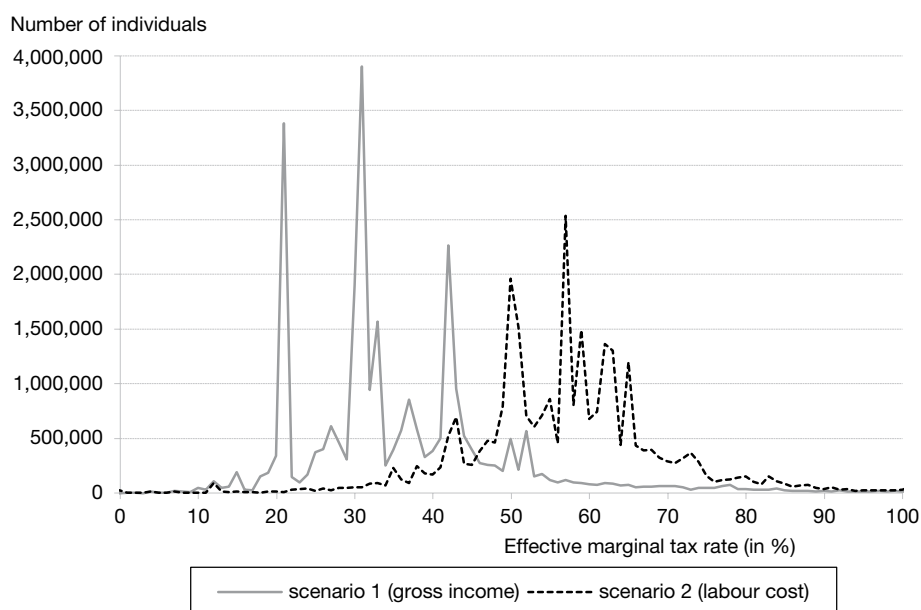
23. Leventi and Vujackov (2016) obtained the same median EMTR using the Euromod model.

24. Equal to the sum of the employer contribution rates (between 12 and 14%) and the CSG/CRDS (8%).

25. In relation to the nominal rates of the scale, these modes are off set, because the gross income rate is shown here and not the taxable net income rate. The rate at 14% is translated to around 10%, 21% ("décote" tax relief on the 14% bracket) to 15% (less visible), and that of 30% to 21-22%. There is barely any trace of the 41% and 45% rates, as few households are marginally taxed at these levels.

26. The main difference between the two scenarios is associated with the reductions in employer contributions which increase marginal rates in the bottom of the distribution and decrease them to zero at 1.6 times the minimum wage (see below).

Figure I
Distribution of EMTR



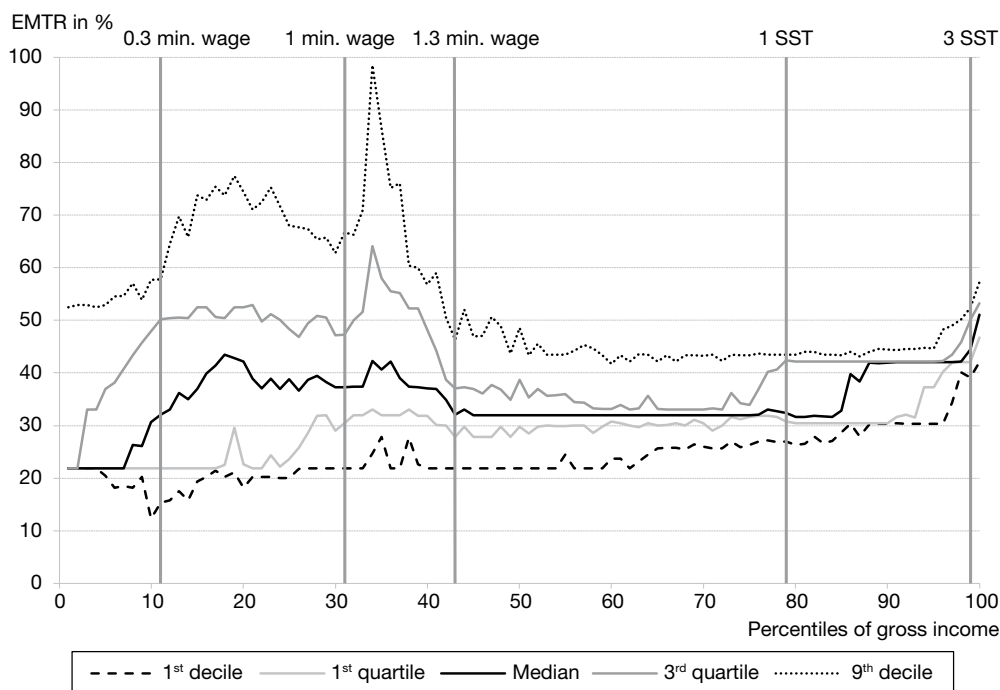
Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France (28.8 million individuals).
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

The median marginal rates stand at between 22% and 51% (or a difference of 29 points) in the first scenario, and between 51% and 66% (or 15 points difference) in the second. This

lower heterogeneity in the second scenario is associated with the inclusion of employer contributions which reduce the variability of the EMTR due to their weight (35/40% of

Figure II
Distribution of EMTR per Income Percentile

A – Scenario 1 (gross income)



B – Scenario 2 (labour cost)



Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France (28.8 million individuals).
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

the labour cost) and the relative consistency of the marginal rates associated with the employer contributions.

Variability of the EMTR for a Given Income

EMTR do not depend purely on the level of individual income, but also on the number of dependents, marital status, employment status (legal status of the employer, percentage of work time), rent (for eligibility for housing benefit) and the incomes of the other people in the household. Variability therefore plays a role according to the level of income: it is high at the bottom of the distribution and decreases overall as incomes rise. The interdecile ratios are approximately 3 to 4 points at the bottom of the distribution and 1 to 2 points at the top. For example, at minimum wage level, 80% of individuals have a marginal rate in a 45-point bracket, compared with a 17/15 point bracket (according to the scenarios) at 2 times the minimum wage. The peak of the variability comes in at a little more than one times the minimum wage and corresponds with the entry in the income tax schedule, while the peak at 2.5 times the minimum wage in scenario two corresponds with the ceiling for CICE business tax credit entitlement.

An alternative representation of the marginal rates according to household living standard shows that the heterogeneity at the given income level is lower (see Online complement C5) confirming that it is associated with the fact that the level of transfers often depends on the structure and resources of the household.

Breakdown of the Average EMTR by Category of Transfer

Analysis of the contribution of each category of transfer to the average marginal rate²⁷ per percentile of annual income helps understand the origin of the wavy curve of the EMTR (Figure III). At the bottom of the income distribution are mostly in-work incentive schemes (RSA *activité* and PPE) which drive the changes in the EMTR: they have a negative contribution at the start of the distribution, then they gradually become positive between 0.3 and 1.2 times the minimum wage in their degressive phase.

The degressiveness of housing benefit beyond a certain income and the progressiveness of income tax accentuate this increase in EMTR between 0 and 1 times the minimum wage,

slightly offset, however, by the stop in receipt of minimum income benefits as incomes rise, which gradually cancels out their contribution. Loss of entitlement to PPE, has the effect of decreasing EMTR from 1.2 times the minimum wage. Between 1.2 times the minimum wage and annual social security limit level 1, the increase in income tax contributions is offset by the gradual removal of housing benefits leading to stability in the EMTR. In scenario two, employer contributions contribute to the drop in EMTR at 1.6 times the minimum wage due to loss of entitlement to the “Fillon” tax relief. In the top third of the distribution, the EMTR increases due to the progressivity of income tax; a slight rise offset at the final end of the distribution by the lower social security contribution rate on the share of income exceeding 3 times the annual social security threshold (SST). It should be noted that the measures which decrease the labour cost for companies (aiming to promote employment), increase the level of marginal rates in the degressive phase (between 1 and 1.6 times the minimum wage for the “Fillon” tax relief) or occasionally when exceeding the eligibility threshold (at 2.5 times the minimum wage for the CICE) of these schemes (Figure III.b).

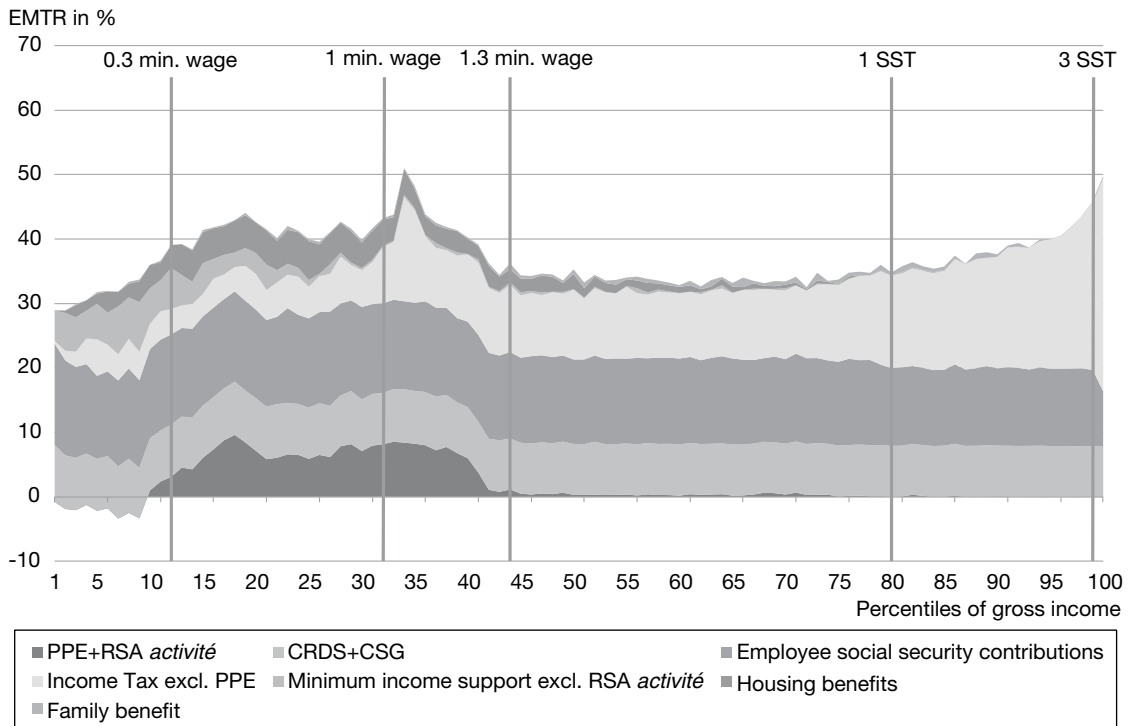
Breakdown by Family Configuration

Family configuration is a key element in determining entitlement to social welfare benefits and the amount of income tax, and especially the EMTR. Average EMTR are relatively similar according to family configuration, varying between 37% and 41% in the first scenario and 57% and 61% in the second. It is for single parents that the average EMTR is the highest (41% in the first scenario and 61% in the second). This is primarily linked with a higher contribution by marginal rates associated with housing benefits and minimum income benefits (11% cumulated against less than 5% in the other configurations see Figure C2-I of Online complement C2). In fact, parents of low-income single-parent families often receive more housing benefits (more favourable scale) and minimum income benefits (higher RSA for single parents); they therefore lose more if their earned income increases. Conversely, the contribution of income tax is lower for single-parent families than for other family configurations because, first, they

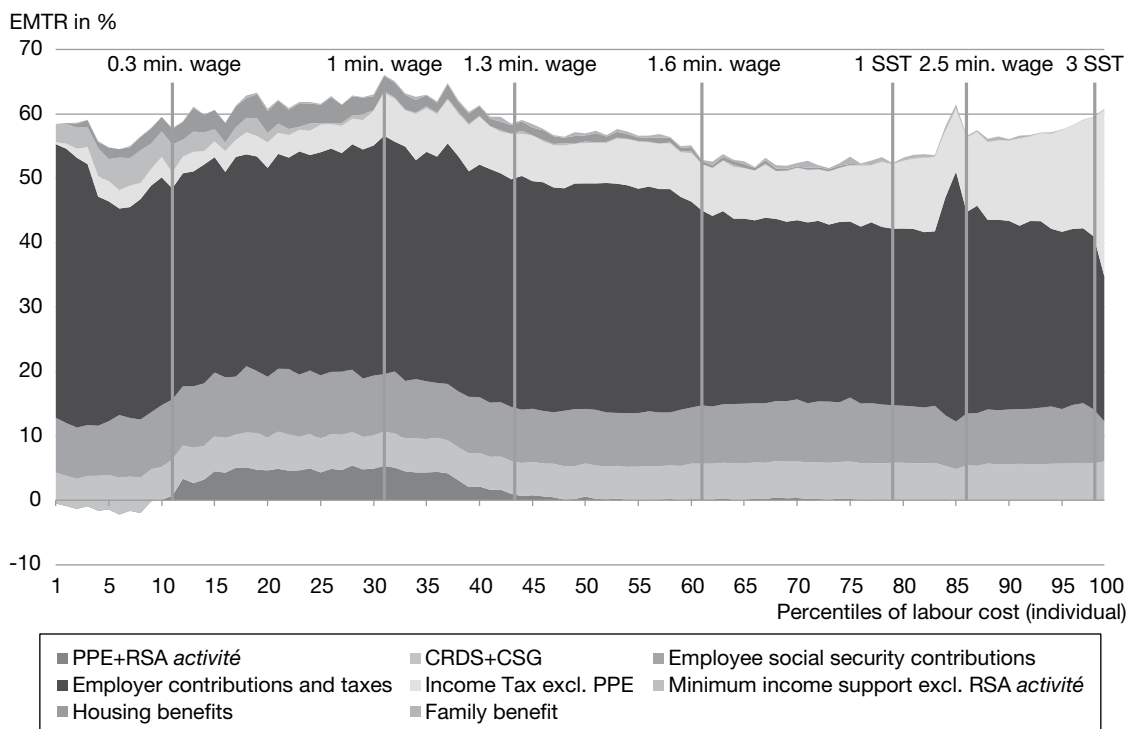
27. Indeed, the equation (2) (cf. Box 2) remains true for any linear operation on the EMTR, in particular the average. Given the sensitivity of the average to extreme values, we have restricted the study to individuals for whom the EMTR is between -20% and 150% (who account for 99.7% of the individuals).

Figure III
Breakdown of the Average EMTR by Type of Transfer

A – Scenario 1



B – Scenario 2



Note: The negative contribution at the start of the distribution is connected with the PPE working tax credit and RSA earned income supplement.
 Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France.
 Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

generally have lower incomes and, second, the first dependent child counts as a full part against a half-part for each of two children.

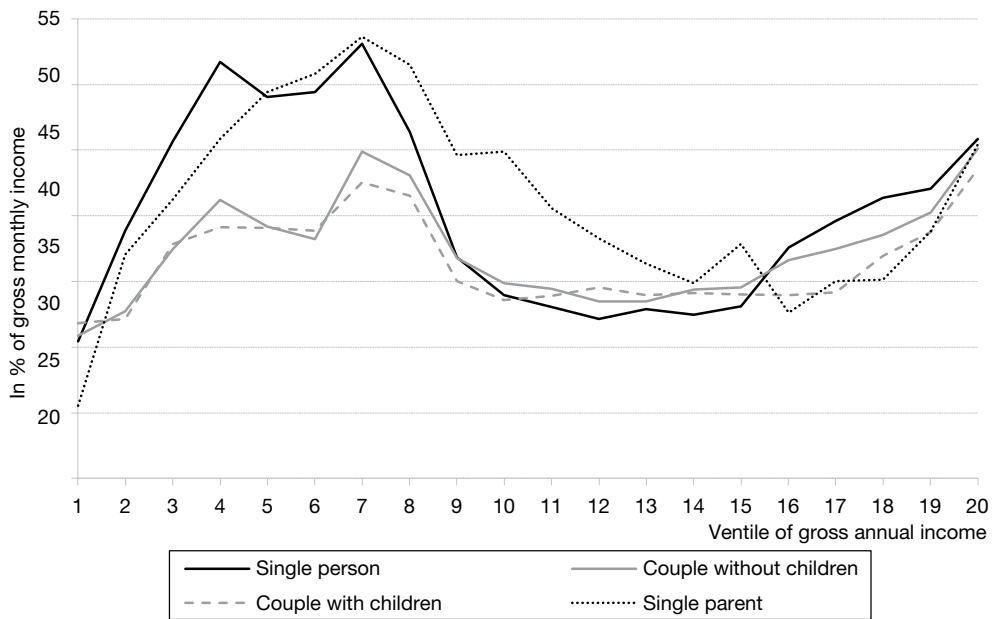
Single people without children have a higher average marginal rate (40% in the first scenario and 60% in the second) than couples with and without children (37% in the first scenario and 57% in the second respectively). Indeed,

single people without children quickly lose housing benefits and therefore have a higher housing benefit contribution to the EMTR than couples.

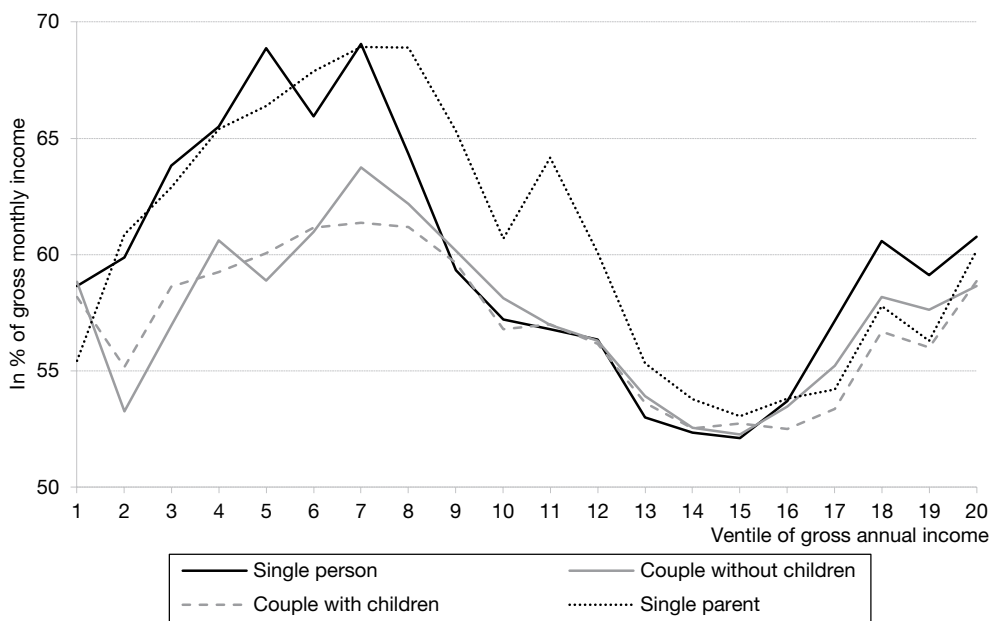
Figure IV presents the average EMTR per ventile of labour cost for the four family configurations. In each instance there is a wavy curve across the entire population, but with two

Figure IV
Average EMTR Depending on the Labour Cost According to Family Configuration

A – Scenario 1



B – Scenario 2



Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France.
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

primary differences: for people with no partner, the increase at the bottom of the distribution then the decrease are more pronounced than for people with partners (and therefore the level is higher in the first half of the distribution). For single-parent families, the level is higher than for single people without children in the middle of the distribution. The steep increase for single people without children is associated with a contribution of the marginal income tax rate which increases more sharply at the entry level of the income tax schedule.

Breakdown by Gender and Marital Status

EMTR are slightly higher for women than for men on average (approximately 1 point in both scenarios). They are slightly lower in the middle of the distribution and higher at the top (see Figure C2-II of Online complement C2). This result is consistent with Immervol (2002) who finds for France higher marginal rates for women for the final third of the distribution. This result is more significant for married women or women in a civil union, who have a median marginal rate of 1 to 2 points higher (depending on the scenario) than that of married men or men in a civil union, particularly at the top of the distribution. However, single women and men (single, widowed or divorced) have

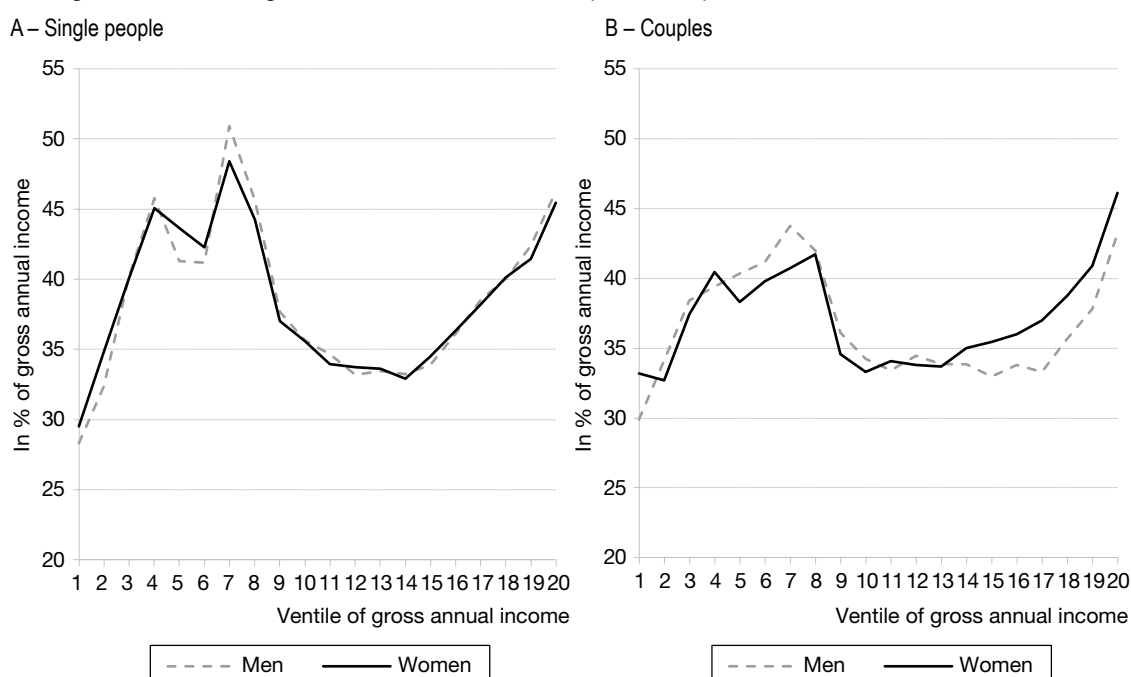
very similar rates (Figure V). A breakdown of the average EMTR shows that these differences for married or civil union couples are primarily linked with income tax at the top of the distribution (and to a lesser extent the PPE at the bottom of the distribution).

Analysis of EPTR over the Year 2014

This section extends the previous analysis at the intensive margin with the extensive margin by giving information on the effective participation tax rates (EPTR) in 2014. Only the key points and those which stand out from the previous analysis are presented; for further details, see figures in Online complement C3.

The median EPTR are 33% in the first scenario and 50% in the second scenario, with a flat distribution, without peaks. Only 1.2% of individuals have EPTR higher than 100%. The average EPTR according to percentiles of income declines slightly in scenario 1, and is relatively stable and rises slightly at the end of the distribution in scenario 2 (see Figure C3-I). These changes are due to several phenomena that offset one another: the contribution of minimum income benefits is relatively high at the bottom of the distribution and then decreases, whereas

Figure V
Average EMTR According to Gender and Marital Status (scenario 1)



Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France.
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

the contribution of income tax and employer contributions increases (see Figure C3-II). This increase in employer contributions leads to the difference seen between scenarios 1 and 2. It should be noted that unlike the EMTR, the contribution of the PPE and RSA *activité* is still negative (and zero from approximately 1.3 times the minimum wage, at which point the individual is no longer entitled to the schemes) because even in their degressive phase, there is still a gain compared with not working.

Another particularity of the EPTR in relation to the EMTR is that they vary much more according to the family configuration. Couples have much lower EPTR than other configurations, regardless of the number of children (Figure VI). This is due to the fact that social welfare benefits and income tax are means-tested in France: taking into account the income of the partner significantly decreases the amount of benefits an unemployed person receives (and may even leave them unentitled). As such, an unemployed person in a couple with a working partner only loses a small amount of benefits when going back to work, unlike a single person whose benefit from minimum income schemes is cancelled out.

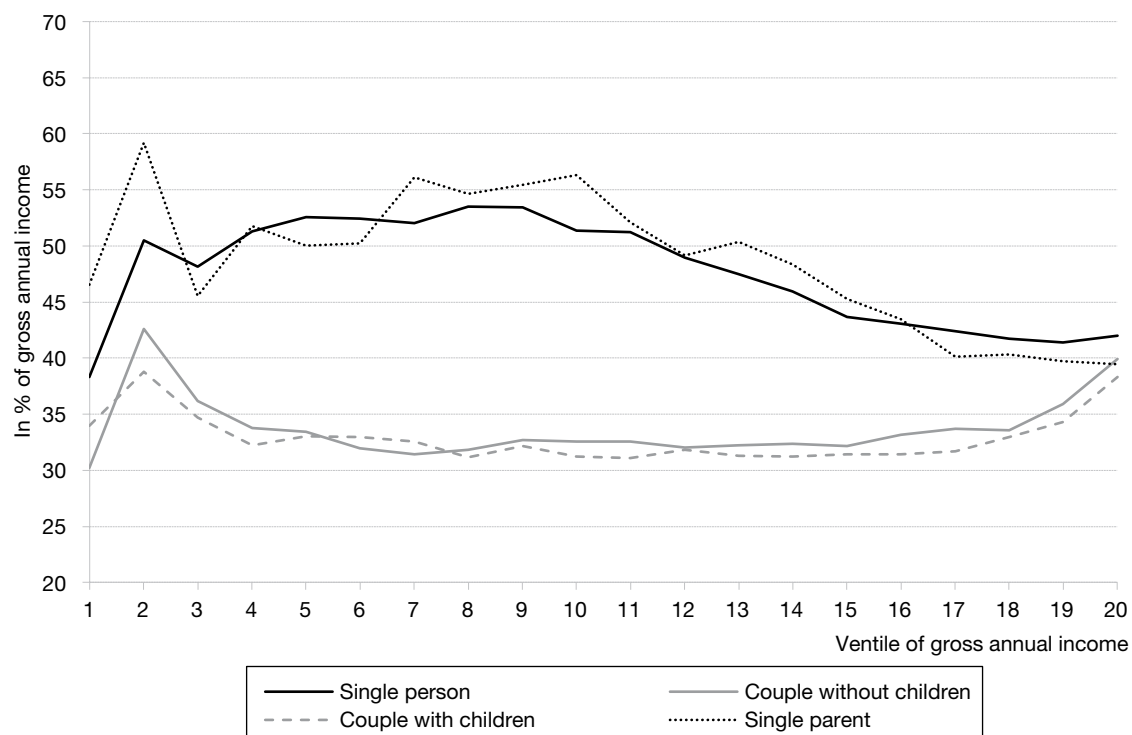
Lastly, the EPTR of men and women are similar. They are slightly higher for men on average, particularly at the bottom of the distribution, whereas they are slightly higher for women at the top of the distribution (see Figure C3-III). This is consistent with Immervol *et al.* (2009) who show that the EPTR of primary earners in France is higher than that of secondary earners (but less significantly than in other countries).

Changes in EMTR and EPTR between 1998, 2008 and 2014

In this section, we assess the effect of legislative changes on EMTR and EPTR between 1998, 2008 and 2014. We particularly focus on the effect of work incentive measures introduced at the start of the 2000s (see Online complement C4 for details).

In 2008, the shape of the EMTR and EPTR curve according to percentiles of income is close to that of 2014, except at the start of the distribution (first tenth of the population): EMTR and EPTR are high but decreasing in 2008 in this portion of the distribution, whereas they are lower but increasing in 2014 (Figure VII). This

Figure VI
Average EPTR by Family Configuration (scenario 1)



Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

change can be explained by the introduction of the RSA *activité*, which decreased the marginal rates of 100% due to the differential part of the RMI, but also by other profit-sharing schemes that were created or bolstered, for the AAH in particular (the contribution of minimum income benefits excluding the RSA *activité* decreased between 2008 and 2014²⁸). Across the entire second part of the distribution, the EMTR and EPTR are slightly lower in 2008 than in 2014 but have the same shape.

As in 2008, the EMTR drop at the start of the distribution but this drop continues after the first decile and the EMTR are significantly lower between the first and fourth deciles in 1998 than in 2008 and 2014. The higher EMTR in 2008 and 2014 across this income bracket are associated

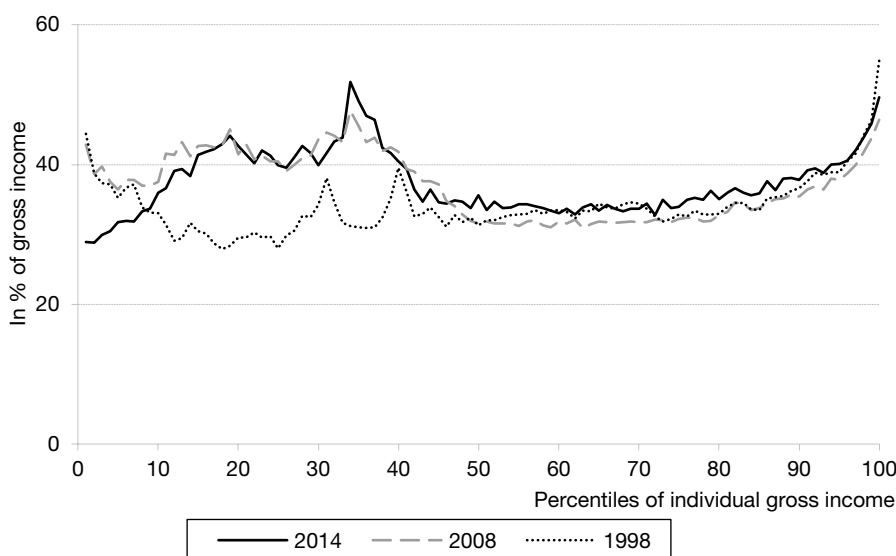
28. It was on average 7 points for the first decile in 2008 compared with 4 points in 2014 (see Online complement C4).

29. Which is consistent with previous studies conducted in this period: Laroque and Salanié (1999) for 1997 and Legendre et al. (2003) for 2000 find a U-shaped EMTR distribution, whereas Bourguignon (1998) finds a double-U curve. It should be noted that in these studies the EMTR are generally illustrated according to the household's standard of living and must therefore be compared with our graphs in Online complement C5.

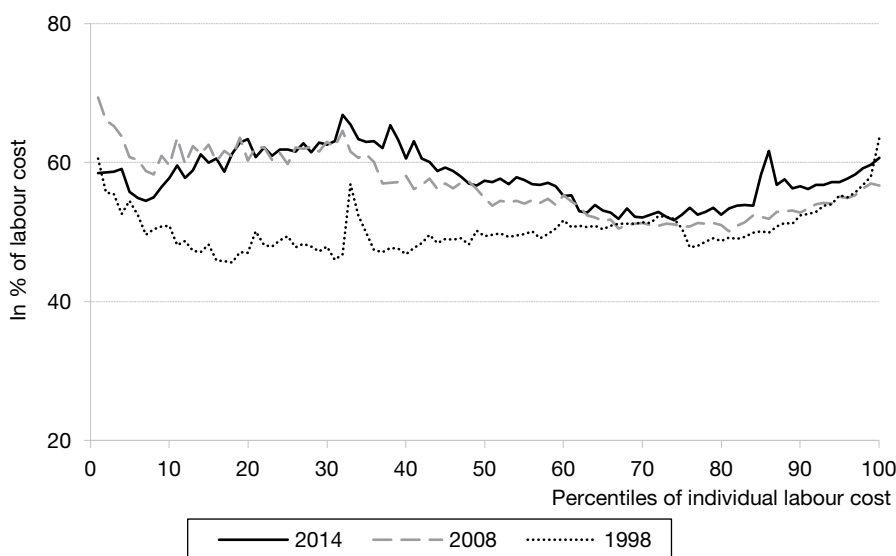
In 1998, the EMTR have a U shape according to gross income, unlike the wavy shape of 2014.²⁹

Figure VII
EMTR and EPTR by Legislative Year and Incidence Scenario

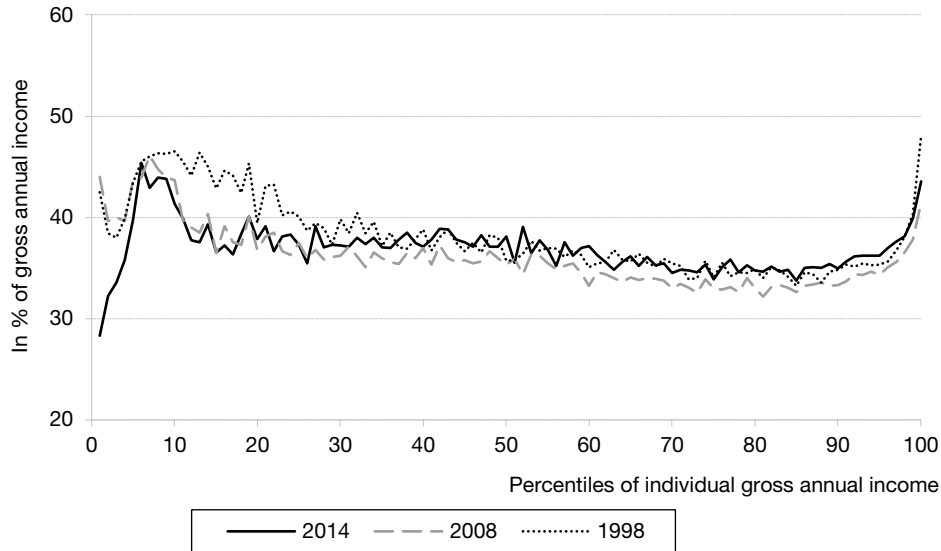
A – EMTR - Scenario 1



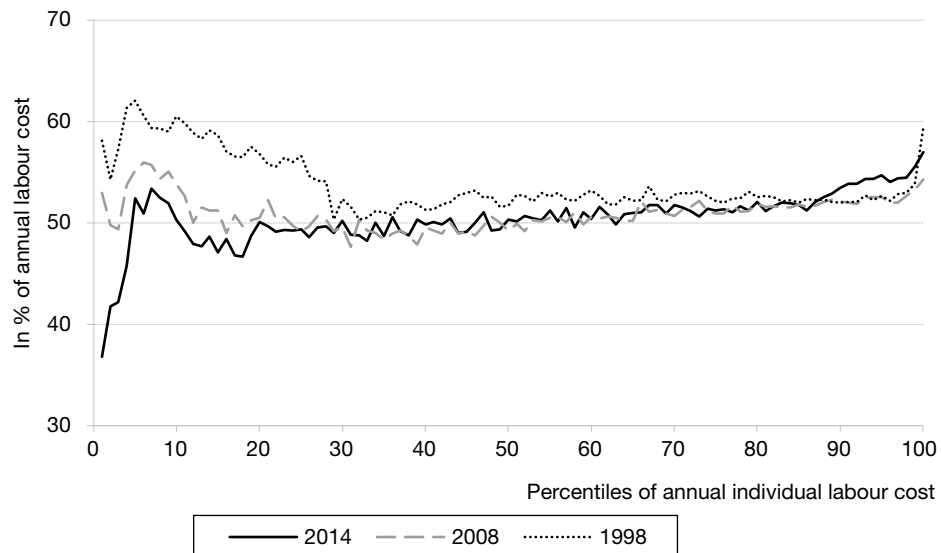
B – EMTR - Scenario 2



C – EPTR - Scenario 1



D – EPTR - Scenario 2



Coverage: Individuals with positive earned income and belonging to an ordinary household in mainland France.
Sources: Insee, survey *Revenus fiscaux et sociaux* 2012 (updated to 2014); Drees and Insee, Ines model.

with the positive marginal rates of the PPE in its degressive phase (see Online complement C4, Figure C4-II).³⁰ For the EPTR, the findings are different. They are higher in 1998 across the first third of the distribution in relation to 2014. Indeed, even in the degressive phase of the PPE, this remains a gain in relation to being unemployed and therefore the PPE clearly increases back-to-work gains across the entire start of the distribution (except at the very start, below the PPE entitlement threshold).

Ultimately, the change in the shape of the EMTR (from a U to a tilde shape) and EPTR (drop in

level in the first third of the distribution) curves between 1998 and 2014 is primarily due to the introduction of employment incentive schemes and in particular the PPE in 2001. These reforms decreased the very high proportion of EMTR and EPTR in relation to 1998 by approximately half (see tables C4-1 and C4-2 of Online complement C4) This decrease was offset by marginal rates that were on average higher at the upper-middle range of the distribution, as

30. And to a lesser extent, with the increase in the contribution of housing benefits (+3 points over the period) due to the reform of 2001/2002 which decreased very high rates but increased them on average.

shown by the rise in average EMTR between 1998 and 2014,³¹ and the increase in the proportion of marginal rates between 60% and 100% (see Table C4-1). Unlike the EMTR, the average levels of EPTR changed little between 1998 and 2014 (see Table C4-2), the effect of work incentive reforms having offset the increase in social security contribution rates.

Discussion

This section discusses a few of our findings on work incentives as regards public policy objectives, normative recommendations of economic theory and international comparisons, before presenting two of the study's limitations.

The study shows that between 1998 and 2014, disincentives to work (EMTR and EPTR above 100%) decreased due to the introduction of employment incentive measures for low-paid workers (RSA *activité* and PPE). These reforms were relatively effective in reducing the welfare trap but were they optimal³² as regards social justice? To this question, Diamond and Saez (2011) conclude that reforms in developed countries over the last few decades aimed at providing incentives to work are consistent with optimal taxation as this increases redistribution to low-paid workers while encouraging participation in the labour market. Indeed, Saez³³ (2002) shows that a earned income tax credit system (like the PPE) is preferable to a system of negative income tax if responses at the extensive margin are high in relation to those at the intensive margin³⁴, which has been confirmed by empirical studies (Blundell & MaCurdy, 1999). In a model incorporating the labour market, Immervol *et al.* (2007) showed that in France (and in European countries in general), a in-work incentive reform focused on low-paid workers is much more desirable than a negative income tax-type measure.

This study has shown that the work incentives for women (EMTR and EPTR) are relatively similar to those of men in France at the intensive and extensive margins. Yet, according to a theoretical efficiency criterion (Ramsey rule), women should be taxed less because their labour supply is more elastic.³⁵ This has sparked much debate within academic research on gender-based taxation (for example Alesina *et al.*, 2011), other authors contesting this differentiated taxation because it could have an impact on decisions to marry and would not meet the criterion of

equity between families (Saint-Paul, 2008). In France, the debate is focused on the individualisation of transfers and particularly income tax. Some economists advocate individualisation of the income tax (Landais *et al.*, 2011) which would have the advantage of greater economic efficiency due to better work incentive mechanisms for the lower-earning partner, whose elasticity of participation would be particularly high in France (Carbonnier, 2014).

We have also shown that single people have much lower incentives to work than other family configurations (especially in the first half of the distribution). To assess the efficiency of this situation in light of the Ramsey rule, it is necessary to know the elasticities of labour supply according to family configuration, which are not well known.³⁶

Lastly, the median EMTR in France are in the high bracket of EMTR in Europe, and are particularly higher than those in the United Kingdom, Spain and Sweden, but lower than those in Germany, Italy and Belgium (Leventi & Vujackov, 2016), and are distinctive for the significant contribution of welfare benefits (particularly in the first two deciles according to Jara and Tumino, 2013), the reason for their high level. Concerning incentives at the extensive margin, only comparisons of representative agents are available for the recent period. They show that EPTR are within the average of European countries (European Commission, 2013, p. 44).

* *
*

31. Associated also with increases in employer pension contribution rates.

32. Traditional models of optimum taxation show that the optimum marginal rate is a U-shaped curve (Saez, 2001), but these analyses do not sufficiently consider incomplete labour markets at the bottom of the distribution (presence of the minimum wage, part-time work, etc.) and are therefore better compared with our graphs above the minimum wage (which do indeed have a U-shaped curve), without giving any clear indications on the shape at the extreme bottom end of the distribution.

33. Negative tax consists in an income guaranteed by the state along with a marginal rate below 100% (RSA basic income support is close to this in France).

34. It should be noted that this result depends on the weight that the government gives to the different groups of income distribution, and no longer holds when the government only cares about the well-being of individuals with no income (Rawlsian case), or when the government does not seek to redistribute income (Saez, 2002, p. 1050).

35. See Blundell and MaCurdy (1999). This is particularly the case for married women with young children.

36. Estimates by Sicsic (2018) show that single people have higher elasticities in France, which would suggest that the state of incentives to work according to family configuration is not efficient.

The analysis of marginal rates and participation rates has given an overview of incentives to work in France according to level of income, by family configuration and by gender. We have shown that the difference in work incentive between men and women is very low or even zero on average (except at the top of the distribution to the detriment of married women), and that work incentives are much lower for single people than for couples (in the first half of the distribution at the intensive margin and across the entire distribution at the extensive margin). The analysis also highlights the change in the shape of the EMTR by income percentile, from a U to a tilde shape, between 1998 and 2014, and the drop in EPTR in the first third of the distribution, particularly with the introduction of the RSA *activité* and PPE schemes.

Two limitations to this analysis must, however be highlighted. Firstly, there are several schemes that give non-zero marginal rates but are not taken into account in this study, particularly local benefits and taxes. Their inclusion would increase the EMTR in the bottom of the distribution due to entitlements associated with minimum income benefits, partial residence tax relief, social tariffs, grants, canteens, etc. Adding just residence tax (*taxe d'habitation*) to the EMTR and EPTR would however have a

relatively low impact for a single person: it would increase the EMTR by 2 to 3 points (according to the scenario) between 0.4 times the minimum wage and 1 times the minimum wage and from 1 to 2 points for the PTR (see representative tax profiles in Online complement C6). According to Anne and L'Horty (2002, 2009), the impact of all local benefits on back-to-work gains (measured by the duration of remaining in a minimum-wage job, in relation to net income³⁷) would be more than 50% for certain family configurations. Secondly, work incentives do not depend solely on short-term financial incentives measured by EMTR and EPTR. Dynamic aspects in the medium/long-term labour supply can have an impact on incentives. Indeed, even with high marginal rates, it can be beneficial to work more (in percentage of work time or intensity) in terms of future gains and productivity (promotion, more advantageous pension or unemployment benefits, positive impact on productivity and employability, etc.).

Despite these limitations, it would be desirable to present and disseminate such indicators more frequently and systematically in order to monitor changes in work incentives over time. □

37. This figure would therefore be lower applied to gross income or the labour cost.

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