Journal of Public Economics 99 (2013) 66–84

Contents lists available at SciVerse ScienceDirect

Journal of Public Economics

journal homepage: www.elsevier.com/locate/jpube

Labor income responds differently to income-tax and payroll-tax reforms ☆

Etienne Lehmann [a,b,*,1], François Marical [c], Laurence Rioux [d]

[a] ERMES (TEPP) University Panthéon-Assas, France
[b] CREST, France
[c] INSEE, France
[d] CREST (INSEE), France

ARTICLE INFO

Article history:
Received 3 November 2011
Received in revised form 16 October 2012
Accepted 9 January 2013
Available online 24 January 2013

JEL classification:
H24
H31
J22
J38

Keywords:
Labor income
Payroll tax
Income tax

ABSTRACT

We estimate the responses of gross labor income with respect to marginal and average net-of-tax rates in France over the period 2003–2006. We exploit a series of reforms to the income-tax and payroll-tax schedules affecting individuals who earn less than twice the minimum wage. Our estimate for the elasticity of gross labor income with respect to the marginal net-of-income-tax rate is around 0.2, while we find no response to the marginal net-of-payroll-tax rate. The elasticity with respect to the average net-of-tax rate is not significant for the income-tax schedule, while it is close to −1 for the payroll-tax schedule. A plausible explanation is the existence of significant labor supply responses to the income-tax schedule, combined with sticky posted wages (i.e., the gross labor income minus payroll taxes divided by hours worked). Finally, the effect of the net-of-income-tax rate seems to be driven by participation decisions, in particular those of married women.

1. Introduction

Labor income taxation is composed of several distinct schedules. According to the OECD,[2] the total tax wedge for an average-wage worker amounted to 29.7% of employers' labor costs in the U.S. in 2010. This tax wedge can be decomposed into 8.2% for transfers to the "central government", 5.8% for "sub-central" governments, and 15.8% for "social security contributions". In France at the same time, the total tax wedge for an average-wage earner amounted to 49.3%, with 9.9% for transfers to the central government and 39.3% for social security contributions. Whether or not labor income responds identically to the different schedules is crucial for determining which type of tax should be used to finance public expenditure, including social security and redistribution. In this work, we focus on the relative responsiveness of labor income to *payroll* taxation (social security contributions, in France) versus *income* taxation.

Most of usual models of the labor market (including the standard labor supply model, the monopoly union model under the right-to-manage, or the individual wage-bargaining model) predict identical income responses to payroll-tax and income-tax schedules. By contrast, the empirical evidence is so far not conclusive because the existing literature never considers the responses to payroll taxes and income taxes at the same time, due to the absence of simultaneous reforms to both schedules for similar individuals over the same period.[3]

In contrast to the literature, we exploit a series of reforms to both income-tax and payroll-tax schedules that occurred in France over 2003–2006 in the bottom half of the labor income distribution. In 2003, there existed two distinct schedules for the reduction in

☆ We are grateful to the editor Wojciech Kopczuk, two anonymous referees, Valérie Albouy, Soren Blomquist, Richard Blundell, Clément Carbonnier, Bart Cockx, Bruno Crépon, Laurence Jacquet, Henrik Kleven, Camille Landais, Guy Laroque, Andreas Peichl, Thomas Piketty, Alain Trannoy, Bruno Van der Linden and participants in seminars at CREST, PSE-Jourdan, IRES, French Ministry of the Economy, the CESifo workshop on "Taxation, transfers and the labour market", the LAGV 2011 conference, the Tinbergen Institute conference 2011 on "Friction and Policy" and the IZA Workshop "Recent Advances in Labor Supply Modeling" for their helpful remarks and comments. We thank Richard Crabtree for editing this manuscript. Remaining errors are ours. The data was accessed through the CASD dedicated to researchers.

* Corresponding author at: CREST, INSEE, Timbre J360, 15 Boulevard Gabriel Péri, 92 245 Malakoff Cedex, France.
E-mail addresses: etienne.lehmann@ensae.fr (E. Lehmann), francois.marical@insee.fr (F. Marical), laurence.rioux@insee.fr (L. Rioux).
[1] Etienne Lehmann is also extramural fellow at IRES Université Catholique de Louvain (Belgium) and research fellow at IZA (Bonn, Germany), IDEP (Marseilles, France) and CESifo (Munich, Germany).

[2] Authors' calculations from the OECD tax database at http://www.oecd.org/dataoecd/44/3/1942514.xls.

[3] Most of the papers focus on the distortions induced by income taxes (e.g. Feldstein, 1995; Auten and Carroll, 1999; Gruber and Saez, 2002; Saez, 2003; Blomquist and Selin, 2010; Cabannes et al., 2011 among others). Another strand of the literature estimates the effects of payroll-tax reforms (e.g. Gruber, 1997; Kugler and Kugler, 2009; Liebman and Saez, 2006; Saez et al., 2012b among others).

0047-2727/$ – see front matter © 2013 Elsevier B.V. All rights reserved.
http://dx.doi.org/10.1016/j.jpubeco.2013.01.004

employers' payroll taxes for low-wage workers, depending on whether the firm had moved to the 35-hour workweek or remained at 39 h. A progressive convergence between the two schedules was implemented from 2003 and completed in July 2005. This resulted in opposite effects for the two types of firms: an increase in the reduction in employers' payroll taxes for those remaining at 39 h (hereafter the "39-hour firms") and a decrease in the reduction for those that had moved to the 35-hour week (hereafter the "35-hour firms"). Over the same period, the *Prime pour l'Emploi*, a working tax credit for low-wage earners, was substantially increased, the maximum amount of benefits being almost doubled between 2003 and 2006. Exploiting this rich set of reforms that affected workers earning less than twice the minimum wage gives us the very rare opportunity to compare the responsiveness of labor income to income-tax and payroll-tax reforms.

The dataset we use is the *Enquête Revenus Fiscaux*, which combines income tax records from the fiscal administration with the French Labor Force Survey (hereafter LFS). We use income tax records to compute the income tax schedule (including the tax credit for low-wage earners). The LFS provides the additional variables we need to reconstruct employer and employee payroll taxes. In particular, we use the labor market history and the usual weekly working time to obtain a monthly labor income and a wage rate, which are both necessary to compute payroll taxes over the period we consider. We are also able to infer whether the firm has moved to the 35-hour week or remained at 39 h, which determines which payroll tax schedule applies. Using this dataset that matches income tax records with the LFS enables us to investigate the responsiveness to both income-tax and payroll-tax reforms.

More precisely, we estimate the short-term responses of gross labor income (labor income inclusive of employer and employee payroll taxes, i.e., total labor cost) to the marginal and average net-of-tax rates[4] for both schedules. We find a significant elasticity (around 0.2) of gross labor income with respect to the marginal net-of-*income*-tax rate. By contrast, the elasticity of gross labor income with respect to the marginal net-of-*payroll*-tax rate is found to be not significant and close to zero. Gross labor income thus responds differently to payroll-tax changes and to income-tax changes, at least in the short-run, which is in contradiction with the theoretical predictions of the most common labor market models. We also find that the income effects of payroll-tax and income-tax changes are different. The elasticity with respect to the average net-of-*payroll*-tax rate does not differ significantly from minus one, while the elasticity with respect to the average net-of-*income*-tax rate is lower and generally non-significant but varies across sub-samples. Our results are robust to the specification of pre-reform income controls.

Our preferred interpretation for these findings is significant labor supply responses to the income-tax schedule, combined with the stickiness of *posted* wage rates (i.e., the gross labor income minus payroll taxes divided by hours worked). The effects of an income-tax reform operate through rapid labor supply modifications. Further investigations indicate that these responses are essentially due to the participation decisions of married women. By contrast, posted wage rates are determined largely through the minimum wage and collective bargaining in France. Our findings suggest that these institutions fail to respond to payroll-tax changes, at least over the three-year period we consider. Our results also suggest that, at least in the short-run, financing social security expenses and redistribution through payroll taxes is less distortive than through income taxes.

A large strand of the literature studies the response of taxable income (i.e. income net of tax deductions) to the marginal net-of-income-tax rate, following the idea of Lindsey (1987) and Feldstein (1995) that this elasticity summarizes all the deadweight losses due to taxation. We here detail our contributions to this literature. *i*) Our first contribution concerns the way of controlling for income effects. While the literature following Gruber and Saez (2002) identifies income effects by controlling for *actual* changes in virtual incomes, we do so by including changes in the average net-of-tax rate computed for a labor income fixed at its initial value. We argue that this method is more consistent with the theoretical framework. This also leads to robust estimates across empirical specifications. *ii*) Our 0.2 estimate of the gross labor income elasticity with respect to the marginal net-of-income-tax rate lies between 0.12 and 0.4, which is the plausible interval for the elasticity of *taxable* income according to Saez et al. (2012a). It is also close to the 0.33 intensive margin elasticity of Chetty (2012). Here, however, we estimate the response of labor income, while most works study the response of *taxable total* income, which includes tax avoidance behavior and (some of) capital income responses. Restricting the comparison to labor income, our estimate is consistent with that of Blomquist and Selin (2010), who find significant responses of 0.2 for men in Sweden, and with that of Saez (2003), who obtains an elasticity of around 0.1 for the US, although his estimates do not significantly differ from 0. Our estimate is higher than the narrow interval of 0.05–0.12 obtained by Kleven and Schultz (2012) for labor income responses in Denmark. *iii*) The existing literature suggests that the elasticity is presumably much higher for top income earners (e.g., Gruber and Saez, 2002). However, we obtain a significant elasticity of labor income with respect to the marginal net-of-income-tax rate by using reforms that affect individuals in the bottom half of the wage distribution. *iv*) Our result that labor income is, at least in the short-run, insensitive to the marginal payroll-tax rate is consistent with those found by other studies on payroll taxation (e.g., Liebman and Saez, 2006; Saez et al., 2012b). More specifically for France, it is in line with Aeberhardt and Sraer (2009), who find that the reduction in employers' payroll tax for low-wage workers did not generate wage moderation (see also Lhommeau and Remy, 2009; Bunel and L'Horty, 2012).

The paper is organized as follows. In Section 2, we detail the institutional backgrounds and expose the main reforms that took place in France over the 2003–2006 period. Section 3 presents the theoretical framework and discusses whether labor income should respond identically to income taxes and to payroll taxes. In Section 4, we present our empirical strategy and discuss the identification. Section 5 describes the dataset used, which combines income tax records with the Labor Force Survey. Section 6 presents results for the respective effects of payroll taxes and income taxes on gross labor income for all employees and for specific subsamples, and the last section concludes.

2. Institutional background

We here describe the reforms to the payroll-tax and income-tax schedules that occurred in France during the 2003–2006 period.

2.1. Income tax reforms

We use the term "income tax" to denote both the income tax per se and a tax credit for low-paid earners (*Prime pour l'emploi*, hereafter PPE). Income tax per se in France is calculated at the fiscal household level, which differs from the usual notion of household: two persons who live as a couple are considered by the administration as a single fiscal household only if they are married or linked by a civil pact. The income-tax schedule is a function of the ratio of total income earned by the fiscal household to the weighted sum (*parts fiscales*) of its members. The amount of tax paid then equals the income tax that would be paid by a single individual whose income is equal to this ratio, divided by the weighted sum. This implies that both the marginal and average net-of-tax tax rates of a given individual change with marital status, spouse's income, the birth of a child, or the departure of adult children. These events are likely to affect labor supply decisions, the only exception being the departure of an adult child which generates an instantaneous change in the tax schedule, while the change in the labor supply, if any, is likely to be smoothed over time. Therefore,

[4] The marginal (respectively average) net-of-tax rate is equal to one minus the marginal (average) tax rate.