Minimum wage and tax evasion: Theory and evidence ☆

Mirco Tonin *

University of Southampton, United Kingdom
IZA, Bonn, Germany

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ABSTRACT

This paper examines the interaction between minimum wage legislation and tax evasion by employed labor. I develop a model in which firms and workers may agree to report less than the true amount of earnings to the fiscal authorities. I show that introducing a minimum wage creates a spike in the distribution of declared earnings and induces higher compliance by some agents, thus reducing their disposable income. The comparison of food consumption and of the consumption–income gap before and after the massive minimum wage hike that took place in Hungary in 2001 reveals that households who appeared to benefit from the hike actually experienced a drop compared to similar but unaffected households, thus supporting the prediction of the theory.

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"Did you know that more than half of the people nominally employed at the minimum wage earn more, and the only reason for such a declaration is to evade taxes and social security contributions? [1]*"*

(Advertisement in *Metro* newspaper for the Hungarian government Green Book, 22 September 2006)

1. Introduction

What are the fiscal implications of introducing or increasing the minimum wage? What is its impact on disposable income? This paper contributes to answering these questions by examining the interaction between minimum wage legislation and tax evasion by employed labor.

I build a simple model in which workers and firms may agree to report less than the true amount of the workers' earnings to the fiscal authorities to avoid the payment of taxes and social security contribu-

tions. The minimum wage poses a constraint on this decision and, as a result, has an effect on compliance with fiscal regulation. In particular, when a minimum wage is introduced or increased, some worker-firm pairs prefer to increase their compliance than to decrease it by going completely underground. Thus, a spike in the distribution of declared earnings appears at the minimum wage level. Moreover, workers who appear to receive a higher wage actually experience a drop in their disposable income, as they are forced to swap undeclared earnings for declared, and taxable, ones. The massive increase in the minimum wage that took place in Hungary in 2001 represents a quasi experiment to test this prediction of the model. Hungary is a country where, like in many other developing and transition countries, underreporting of earnings is widespread. I use panels derived from the household budget survey to compare the dynamics of food consumption, as a proxy for true income, and of the consumption–income gap for households that appear to benefit from the minimum wage hike, the treatment group, and for similar but unaffected households, the control group. The analysis consistently shows across different specifications that the treated households experienced a drop in food consumption and in the consumption–income gap compared to households in the control group, thus supporting the prediction of the theory. Interestingly, the effect is present when restricting the sample to skilled workers, while it is not for unskilled or semi-skilled workers. This suggests that relatively more productive workers may be concealing some of their earnings by declaring the minimum, while low productivity workers may be genuinely earning the minimum wage.

Undeclared work is a serious issue in many countries. It is difficult to obtain reliable data on its extent, but raw estimates indicate that the phenomenon is relevant, particularly in transition and developing countries. In a recent report by Eurostat (2007), based on a representative survey of individuals in the European Union, 5% of all dependent employees admitted having received all or part of their salary as

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envelope wages within the past 12 months. The country with the highest incidence is Romania, with a share of 23%, followed by Latvia, Bulgaria, Poland, and Lithuania, all with a double digit share, with Estonia and Hungary just below. In Russia, 8% of the employees reported that they received part of their income "under the table" (Petrova, 2005). The phenomenon is not limited to Central and Eastern European economies. The OECD estimates a 30% shortfall in social security contributions due to undeclared work for Hungary, Mexico and South Korea, and a shortfall above 20% for Italy, Poland, Spain and Turkey (OECD, 2004a). In Turkey, firms belonging to the formal sector are estimated to underreport 28% of their wage bill, and for around 50% of the employees enrolled in the Social Security Organization, the wages reported by employers are at the minimum insurable level (World Bank, 2006). According to the World Bank, "in Argentina, roughly 15% of workers receive pay partly on the books and partly off the books" (World Bank, 2007). A World Bank study on labor markets in Eastern Europe and the Former Soviet Union (World Bank, 2005) notices how in several countries in the region "disproportionately high shares of workers cluster on declared wages at or just above the minimum wage (with evidence of additional undeclared incomes above the minimum), creating incentives to sustain a high minimum wage to sustain tax revenue" and calls for further research on this aspect of minimum wage policy. This is indeed the aim of this paper.

This work can be seen as integrating two strands of literature. The literature on the minimum wage is very rich and informs a lively policy debate, mainly focusing on the effects on employment.[2] Recently, several empirical studies have considered the impact of the minimum wage on aspects other than employment, such as fringe benefits (Simon and Kaestner, 2004[3]), prices (Lemos, 2008), profits (Draca et al., 2011), reservation wages (Falk et al., 2004). This paper highlights another aspect of minimum wage policy that has not been considered so far and shows how the minimum wage affects workers and firms through the "fiscal channel".[4,5] The literature on minimum wage also deals extensively with its effects on the wage distribution. A spike at the minimum wage level has been observed in several instances (see, for instance, DiNardo et al., 1996; Dickens and Manning, 2004). Such a spike has been defined as a "puzzle" for several standard types of labor market models (Brown, 1999) and as an "anomalous finding from the standpoint of the standard model of the low wage labor market" (Card and Krueger, 1995, p. 152). Proposed rationalizations include reductions in non-wage compensation or increases in required effort to offset a binding minimum wage, flatter earnings profiles and adjustments in the amounts of hours worked. The model presented here proposes an alternative rationale for the observed spike in a perfect competition framework with perfect elasticity of substitution between labor types.

The second strand of literature that this paper addresses deals with the theoretical and empirical study of tax evasion and the shadow economy.[6] The literature on tax evasion has mainly been focused on personal income tax and the compliance decision by an individual filling

in the tax declaration form. However, due to the tax withholding and information reporting systems present in many countries, this is not an accurate description for the case of employed labor. Indeed, the rate of non-compliance for wages and salaries at the stage of filling the tax declaration form is often negligible. For instance, Klepper and Nagin (1989) report a mere 0.1% of non-compliance for wages and salaries at this stage in the US, i.e. lower than for any other income category. Therefore, to study tax evasion by employed labor it is necessary to take the interaction between the employer and the employee into account[7,8]. Here I model this interaction by developing a novel and simple model of tax evasion based on the plausible assumption that tax authorities possess an imperfect detection technology. On the empirical side, this paper contributes to the methodology pioneered by Pissarides and Weber (1989) to study underreporting by using income and consumption data from household budget surveys. Pissarides and Weber (1989) study underreporting by self-employed workers in the UK by assuming expenditure on food to be correctly reported by all income groups, while income is correctly reported by employees, but underreported by the self-employed. Instead of food consumption, Feldman and Slemrod (2007) use charitable cash contributions in unaudited tax returns. They estimate the relationship between charitable contributions and reported income, depending on the source of income, and attribute to underreporting the fact that the propensity to make a contribution is higher out of self-employment income than out of wages and salaries. This methodology has also been used to study underreporting by private sector employees, using public sector employees as a control group assumed to correctly report income (Besim and Jenkins, 2005); however, Gorodnichenko and Sabirianova Peter (2007) take the opposite view in their study on bribery in Ukraine. They use the large estimated sectorial gap in reported earnings between the public and the private sectors and the absence of an expenditure gap to identify the size of unreported bribes to public officials. A weakness of the approach used in this literature is indeed the need to identify a group that is not evading. An advantage of the approach used in this paper is that it does not need to assume that a group truthfully reports income. The minimum wage hike represents a shock to the "underreporting technology" affecting some workers but not others and this variation is exploited to identify the impact of the minimum wage on underreporting. Beside food consumption, I also use the income–consumption gap, as in Gorodnichenko et al. (2009) who study tax evasion in Russia by looking at the impact of the flat tax reform of 2001.

The rest of the paper is organized as follows: the next section introduces the model. In Section 3, the various effects of the minimum wage are explored. The following section tests the implications of the model for disposable income by using Hungarian data. The last section concludes the paper.

2. The model without minimum wage

The size of the population is exogenously given and normalized to 1. Every individual is characterized by a productivity y_i, distributed in the population according to pdf $g(y)$ and cdf $G(y)$ on the support $[\underline{y}, \bar{y}]$, where $\underline{y} \geq 0$. The labor market is competitive, each firm employs one worker, there is no capital, and production is equal to labor input. Moreover, there is free entry of firms, firms can observe workers' productivity, and workers can move from one firm to another at no cost.

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[2] See Brown (1999) for a review.

[3] In particular, they study how minimum wages affect the provision of employer health insurance and pension coverage using US data for 1979–2000 and find no discernible effect. Given that fringe benefits can be used for tax avoidance purposes, the contribution of the present study is complementary to that of Simon and Kaestner (2004).

[4] A related paper is McIntyre (2006), who uses Brazilian data and focuses on estimating the cost associated with evasion and finds, in line with the assumption in this paper, that there is no fixed cost of evading, while the marginal cost equals 8.1% of the distance from the legal requirement.

[5] There is a normative literature that analyzes the role that the minimum wage can play as an instrument in optimal income taxation. Lee and Saez (2010) analyze the case of a perfectly competitive labor market and find that a binding minimum wage is desirable if rationing is efficient and the government values redistribution toward low wage workers.

[6] See Andreoni et al. (1998) or Slemrod and Yitzhaki (2002) for surveys on tax evasion and Schneider and Enste (2000) for a survey on the shadow economy.

[7] The study of tax evasion by employed labor is of particular interest as the fiscal imposition on labor in the form of social security contributions (SSC) and personal income tax (PIT) represents the bulk of fiscal revenues in many countries; for instance labor taxes are the largest source of tax revenue in the EU-25, representing around half of total tax receipts (Eurostat, 2006).

[8] For a recent contribution on the role of firms in tax enforcement see Kleven et al. (2009). Kolm and Nielsen (2008) study a search model in which workers and firms agree on the amount of income that goes unreported.