INTERNATIONAL POLICY CENTER
Gerald R. Ford School of Public Policy
University of Michigan

IPC Working Paper Series Number 101

Minimum Wage and Tax Evasion: Theory and Evidence

Mirco Tonin

August 4, 2010

MINIMUM WAGE AND TAX EVASION: THEORY AND EVIDENCE*

Mirco Tonin

July 9, 2010

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 appear to benefit from the hike actually experienced a drop compared to similar but unaffected household, thus supporting the prediction of the theory.

*Economics Division, School of Social Sciences, University of Southampton. I thank the Department of Economics at Central European University and the Hungarian National Bank, where part of this research was conducted, for their hospitality. I also thank the Institute of Economics at the Hungarian Academy of Sciences for its hospitality and for providing the data. Comments and suggestions by John Hassler, György Molnár, Torsten Persson, David Strömberg, Jim Albrecht, Péter Benczúr, Milo Bianchi, John Earle, Peter Fredriksson, Nicola Gennaioli, Ethan Kaplan, Gábor Kézdi, István Kónya, János Köllo, and several seminar and conference participants have been most helpful. I am grateful to Christina Lönnblad for editorial assistance. Financial support from Jan Wallander's and Tom Hedelius' Research Foundations is gratefully acknowledged.

"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)

I. 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 worker's earnings to the fiscal authorities to avoid the payment of taxes and social security contributions. The minimum wage poses a constraint on this decision and, in this way, 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 provides 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,

1. "Tudta, hogy a papíron minimálbérért dolgozók több mint fele többet keres annál, és csak azért van minimálbérre bejelentve, hogy kikerülje az adó- és járulékfizetést?" (own translation).

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 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. 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 percent 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 other aspects than employment, like fringe benefits (Simon and Kaestner, 2004[3]), prices (Lemos, 2008), profits (Draca et al., 2006), reservation wages (Falk

2. See Brown (1999) for a review.

3. In particular, they study how minimum wages affect the provision of employer health insurance and

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 and, in related work (Tonin, 2007), I present some cross-country evidence suggesting that the mechanism analyzed here indeed contributes to shape the observed distribution of earnings in Europe.

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 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

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.

is necessary to take the interaction between the employer and the employee into account[7,8]. Here I model the 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 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 (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 sector 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, Martinez-Vazquez and Sabirianova (2009) who study tax evasion in Russia by looking at the impact of the flat tax reform of 2001.

The next section introduces the model. In section 3, the various effects of the minimum

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.

wage are explored. The following section tests the implication of the model for disposable income by using Hungarian microdata. The last section concludes.

II. 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.

Firms are risk-neutral and maximize expected profits. In an environment without tax evasion, profits for a firm employing a worker with productivity y_i are given by

$$\pi_i = y_i - w_i,$$

where w_i is the gross wage[9]. Firms have an obligation to withhold taxes and social security contributions and transfer them to the fiscal authorities. Taxation is at the proportional rate $t \in (0, 1)$. Workers preferences are described by an additively separable concave utility function, increasing in consumption, C, and decreasing in labor supply, L. I assume that there is no intensive margin in labor supply. The utility function can be expressed as

$$U = u(C) - \bar{u}L,$$

where $\bar{u}$ is the normalized cost of work and L is an indicator taking the value of 1 if employed and 0 otherwise. Consumption equals income and net labor income is given by

$$I_i = w_i(1 - t).$$

The wedge between the gross wage paid by the firm and the net wage received by the worker, tw_i, is paid to the fiscal authorities. Free entry of firms implies that in equilibrium,

9. No distinction is made between labor cost and gross wage and the two concepts are equivalent in the model.

the expected profits are zero which, in turn, in the full compliance case implies that a worker with productivity y_i would receive a gross wage y_i, from which the firm would deduct taxes ty_i, thereby leaving the worker a net wage $(1-t)y_i$.

In this economy, however, it is possible to evade taxes and social security contributions by not reporting part or all of the worker's earnings to the authorities. A firm employing a worker with productivity y_i must therefore decide how much of the worker's production to declare to the tax authorities, x_i, and how much to conceal, $y_i - x_i$. If $x_i = y_i$, the firm is fully compliant with the regulations. If $x_i = 0$, the full product is hidden from the authorities and the firm-worker pair operates completely in the black economy. If $x_i \in (0, y_i)$, there is underreporting. A worker-firm pair can thus operate in the formal economy, by declaring a strictly positive income, or be completely in the black market, by declaring nothing. A worker can also decide to be inactive. In this case, to simplify notation, utility is assumed to correspond to $-\bar{u}L$.

Tax authorities may inspect firms to find out whether they comply with fiscal regulation. I assume there to be an exogenously given probability of an audit being performed $\gamma \in [0, 1]$. Fines proportional to the amount of evasion are imposed on firms in case tax evasion is detected and, given the assumption of risk-neutral firms and risk-averse workers, there is no incentive for workers and firms to negotiate a different risk-sharing arrangement. However, the fact that an audit is performed does not imply that the authority with certainty discovers the true tax liability. Instead, it may find evidence to impute an income $\hat{y}_i \in [0, y_i]$, where y_i is the true product. Imperfect detection is a plausible assumption and is supported by empirical evidence. For instance, Feinstein (1991) estimates that IRS examiners on average managed to detect only half of the tax evasion in the forms they audited[10], while Erard (1997) rejects the hypothesis of perfect detection in his empirical investigation based on the TCMP (Taxpayer Compliance Measurement Program).

I assume that $\hat{y}_i$ is distributed over the support $[0, y_i]$[11] according to pdf $h(\cdot)$ and cdf $H(\cdot)$, so that $H(0) = 0$ and $H(y_i) = 1$, and $H(\cdot)$ does not depend on x_i. To simplify the discussion, I assume that $h(\cdot) > 0$ within the support, so that $H(\cdot)$ is invertible within $[0, y_i]$.

10. An IRS study found that for every dollar of underreported income detected by examiners without the aid of third-party information documents, another $ 2.28 went undetected (cited in Feldman and Slemrod, 2007).

11. The assumption is that the tax authority cannot assess and upheld in court a tax liability higher than the true one. To extend the model to situations where this may not be the case, due for instance to ambiguity in the tax code, would be straightforward.

Given a declaration of x_i and collected evidence of a true tax liability of $\hat{y}_i$, the tax authority imposes on the firm, in case $\hat{y}_i > x_i$, the payment of $\theta t\left(\hat{y}_i - x_i\right)$, consisting of taxes plus an additional fine proportional to the assessed tax evasion, thus $\theta > 1$. In case $\hat{y}_i \leq x_i$, the tax authority cannot prove any tax evasion, so no fine is imposed[12]. Given a true product y_i and a reported one $x_i \in [0, y_i]$, the expected fine in case of auditing, f_i, is

$$f_i = t\theta \int_{x_i}^{y_i} (\hat{y}_i - x_i) h(\hat{y}_i) d\hat{y}. \tag{1}$$

Below, I determine the equilibrium wage and evasion. For convenience, subscripts are suppressed where not necessary.

II.A. Equilibrium without minimum wage

For a firm employing a worker with productivity y, declaring x, and paying a gross wage w, the possible realizations of profits are given by[13]

$$\pi = \begin{cases} y - w & \text{with probability } 1 - \gamma \\ y - w - f & \text{with probability } \gamma \end{cases},$$

where f, the expected fine in case an audit is conducted, is given by (1). Therefore, the expected profits for the firm are

$$E\left(\pi\right) = y - w - \gamma f. \tag{2}$$

Income I for a worker employed in a firm paying a gross wage w and declaring to the fiscal authorities x is given by

$$I = w - tx. \tag{3}$$

This expression captures the fact that taxes and social security contributions are deducted

12. An equivalent narrative is that in an audit, the tax authority may find no evidence at all of tax evasion with probability $H(x_i)$, which is increasing as the tax liability declared to the authorities increases. Conditional on detection taking place, the density for any given level of income $\hat{y}_i \in [x_i, y_i]$ being discovered is given by $h\left(\hat{y}_i\right) / \left[1 - H\left(x_i\right)\right]$.

13. Actually, when an audit is performed, possible realizations of profits are a continuum, due to the stochastic nature of the fine. For expositional convenience, the expected value of the fine is considered.

from the worker's declared gross wage x, not from his true gross wage, w. As income is non-stochastic, income maximization corresponds to utility maximization, given the assumption that, conditional on being employed, (indirect) utility only depends on net income.

The firm and the worker agree to choose x so as to maximize the expected total surplus available to them, equivalent to the product minus total expected payments to fiscal authorities, represented by taxes and social security contributions paid on the declared wage and expected fines. Therefore, the optimal declaration is

$$x^* = \arg \max_{x \in [0,y]} y - \gamma f - tx. \tag{4}$$

After substituting (1) into (4), the first-order condition is

$$H(x^*) = 1 - \frac{1}{\gamma\theta} \Longleftrightarrow x^* = H^{-1}\left(1 - \frac{1}{\gamma\theta}\right).$$

The second-order condition, $-t\gamma\theta h(x) < 0$, is always satisfied. The boundary condition $x \leq y$ is always satisfied. Notice that full compliance (i.e. $x = y$) does not take place unless $\gamma\theta \to +\infty$. The condition $x \geq 0$ implies that full evasion will take place, i.e. $x = 0$, when enforcement is very weak, i.e. $\gamma\theta \leq 1$. To simplify the notation, the two enforcement parameters are summarized by $\alpha \equiv 1/(\gamma\theta)$. To summarize, the solution to the reporting problem without minimum wage is given by

$$x^* = \begin{cases} H^{-1}(1-\alpha) & \text{if} \quad \alpha < 1 \\ 0 & \text{if} \quad \alpha \geq 1 \end{cases}. \tag{5}$$

As $\partial\alpha/\partial\gamma < 0$ and $\partial\alpha/\partial\theta < 0$, in an interior solution, the fraction of production that is evaded decreases as enforcement improves.

The equilibrium fine, f^*, is given by substituting (5) into (1). Substituting this into (2) and considering the free entry condition, we get the equilibrium gross wage, $w^* = y - \gamma f^*$, that substituted into (3) gives the equilibrium net income

$$I^* = y - \gamma f^* - tx^*. \tag{6}$$

To obtain a closed form solution, from now on I will assume $h(\cdot)$ to be uniform in the

support $[0, y]$, i.e. $\hat{y}_i \sim U_{[0,y_i]}$[14]. The expression for the expected fine becomes[15]

$$\gamma f = \gamma t \theta (y - x)^2 / (2y) . \tag{7}$$

Thus, the cost of evasion is quadratic in the amount of evasion, $y - x$, as assumed, for instance, in Marion and Muehlegger (2008). The optimal reporting behavior given by (5) becomes

$$x^* = \begin{cases} (1-\alpha)\, y & \text{if} \quad \alpha < 1 \\ 0 & \text{if} \quad \alpha \geq 1 \end{cases} . \tag{8}$$

Thus, the model implies that, irrespective of the specific level of productivity, a constant fraction of the true tax liability is revealed to the fiscal authorities. Using (7), the expected fine is given in equilibrium by

$$\gamma f^* = \begin{cases} yt\alpha/2 & \text{if} \quad \alpha < 1 \\ yt/(2\alpha) & \text{if} \quad \alpha \geq 1 \end{cases} \tag{9}$$

and thus, substituting (8) and (9) into (6), I get the worker's equilibrium net income

$$I^* = \begin{cases} y(1-t) + \alpha y t/2 & \text{if} \quad \alpha < 1 \\ y\left[1 - t/(2\alpha)\right] & \text{if} \quad \alpha \geq 1 \end{cases} . \tag{10}$$

Given the detection technology, the expected fraction of unreported tax liability, $y - x^*$, that is discovered in case of auditing is

$$\int_x^y (\hat{y} - x^*) h(\hat{y}) d\hat{y} / (y - x^*) = \alpha/2, \tag{11}$$

i.e. a fraction corresponding to half the ratio of evaded income over true product. Thus, it is relatively easy to get away with tax-evasion. For example, in an economy where 30% of the

14. Notice that this assumption is needed to derive simple analytical solutions, but it is not necessary for the Propositions below to hold. What is actually required is a model that generates an internal solution to the tax evasion problem through maximization of a smooth utility function that depends on income and in which declared income increases with productivity.

15. In Tonin (2007) I present an alternative setting for imperfect detection in which the tax authority devotes an amount of "auditing resources" to every taxpayer. This gives rise to an equivalent expression for the expected fine. I also show that the mechanism presented in this paper is robust to the case of the probability of an audit being conditioned on declared income.

income is concealed, only 15% of the evasion is, on average, detected in case of auditing.

III. Effects of the minimum wage

In this section, I study what are the effects of introducing a minimum monthly wage ϖ, with universal coverage, in the economy described in the previous section. Workers cannot be legally employed at a wage below the minimum, in the sense that their reported gross wage cannot be below the minimum. The assumption in the model is that the minimum wage is fixed on a monthly basis for full-time work and that no alternative working-time arrangements are available. This is a good approximation of the Hungarian case, on which I conduct the empirical analysis[16]. Moreover, in Tonin (2007), the model is extended to the case where the minimum wage is fixed on an hourly basis, labor supply can vary across workers and underreporting can involve both hours of work and hourly wage. The results remain qualitatively unchanged. In the following, I focus on the case with partial evasion, i.e. $\alpha \in (0,1)$ [17].

With the introduction of a minimum wage, (4) becomes

$$x^* = \arg \max_{x \in \{0\} \cup [\varpi, y]} \quad y - \gamma f - tx.$$

The only difference is in the choice set which shrinks from $[0, y]$ to $\{0\} \cup [\varpi, y]$. The introduction of the minimum wage divides worker-firm pairs into three categories:

1. High productivity: $y_i > \varpi / (1 - \alpha)$
2. Intermediate productivity: $\varpi \leq y_i \leq \varpi / (1 - \alpha)$

16. In 2001-2000 part-timers accounted for only 3.6% of all employees. See section IV. for further details on Hungary. According to Eurostat data from LFS, the share of part-timers in Central and Eastern European countries is generally low, at around 7% of the employees. Notice that according to the OECD "To counter this [under-declaring earnings per employee], the tax authorities may appeal to employment regulations such as the minimum wage and *restrictions on part-time and temporary work*. This issue helps explain why countries with a large informal economy maintain de facto strict employment regulations, even though these regulations are seen by many analysts as a prime cause of informality." (OECD, 2004, page 227, italics added).

17. For this to be the case, I need $\gamma\theta > 1$. By assumption $\theta > 1$, but γ, the probability of being subject to an audit, may be low, so this condition may seem restrictive. Notice, however, that in this model, an audit is extremely ineffective. As already mentioned if, for instance, 30% of income is evaded, only 15% of evaded income is, on average, discovered during an audit. Thus, instead of a full-fledged investigation, an audit should in the present set-up rather be interpreted as a routine check by the fiscal authorities, thus occurring much more frequently than a thorough inquiry.

3. Low productivity: $y_i < \varpi$.

Worker-firm pairs characterized by high productivity would have declared more than the minimum wage anyway, so they are unaffected by it. The minimum wage is instead a binding constraint for worker-firm pairs that would have declared less in its absence.

In particular, a low productivity worker, i.e. with $y_i < \varpi$, can only work in the black market or be inactive. The possibility of a worker paying back part of his wage to the firm is thus excluded. The main results are qualitatively unaffected by this modelling choice. What can be shown (see Appendix for derivations) is that, if $\alpha > t/2$, workers with productivity below the minimum wage work in the black market, otherwise they withdraw from the labor market. Thus, the prediction is that, for a given tax rate, in economies where enforcement is quite effective, i.e. α is low, the minimum wage pushes workers into inactivity and therefore, has a negative impact on efficiency, as productive labor remains idle. Instead, in economies where enforcement is not very effective, the minimum wage has no negative impact on efficiency as workers continue to produce in the black market.

The possibility of declaring the minimum wage and thus, participating in the formal labor market, is available for worker-firm pairs characterized by intermediate productivity, whose optimal declaration in case of no minimum wage regulation is less than ϖ, but with a productivity above ϖ. What can be shown is that, if the degree of underreporting is low, i.e. $\alpha \leq 1/2$, these workers will all increase their compliance and declare the minimum. If $\alpha > 1/2$, workers with productivity below $\varpi/\left[2\left(1-\alpha\right)\right]$ will instead work in the black market.

The results are summarized in the below proposition.

Proposition 1 *The introduction of the minimum wage in an economy with underreporting of earnings induces some workers to increase compliance by increasing declared earnings to the minimum wage level. Workers with a high productivity are unaffected. Workers with a low productivity work in the black market if enforcement is not too effective, otherwise they withdraw from the labor force.*

The distribution of declared earnings x before the introduction of the minimum wage is given by

$$g_x(x) = \begin{cases} g\left(\frac{x}{1-\alpha}\right) & if \quad \underline{y}(1-\alpha) < x < \bar{y}(1-\alpha) \\ 0 & otherwise \end{cases},$$

where $g(\cdot)$ is the pdf of the productivity distribution. After the introduction of the minimum wage, the distribution of declared earnings is given by

$$g_{mw}(x) = \begin{cases} \int_{\underline{y}}^{\varpi \max\left\{\frac{1}{2(1-\alpha)},1\right\}} g(y)dy & if \quad x = 0 \\ \int_{\varpi \max\left\{\frac{1}{2(1-\alpha)},1\right\}}^{\frac{\varpi}{1-\alpha}} g(y)dy & if \quad x = \varpi \\ g\left(\frac{x}{1-\alpha}\right) & if \quad \varpi < x \leq \bar{y}(1-\alpha) \\ 0 & otherwise. \end{cases}.$$

Thus, a "smooth" distribution of productivity is associated with a "smooth" distribution of declared earnings without a minimum wage. However, with the introduction of the minimum wage, two spikes appear at the minimum wage level and at zero. Without tax evasion, instead, the distribution would be truncated at the minimum wage. Thus, I can state the following:

Proposition 2 *In a perfectly competitive labor market with perfect elasticity of substitution between labor types, a spike at the minimum wage level appears in the distribution of declared earnings with underreporting of earnings.*

Figure 1 depicts declared income and disposable income as a function of productivity with and without the minimum wage. Declared income when there is no tax evasion is also plotted as a reference.[18]

The effects of a minimum wage hike on disposable income can be summarized in the following proposition (see the Appendix for proof):

Proposition 3 *As a result of a minimum wage hike, workers whose declared earnings before the hike are between the old and the new minimum wage experience a decline in income. Other workers are unaffected. For those workers declaring the new minimum wage after the hike, the decline in income increases with the distance between the new minimum wage and the declared income before the hike.*

18. A corollary of the previous analysis is that the interaction of minimum wage and underreporting transforms a nominally neutral tax system into a regressive one. Moreover, looking at the impact on total fiscal revenues, including both revenues due to voluntary compliance and fines, it emerges that revenues unambigously increase with the minimum wage when underreporting is high ($\alpha > t/2$), while the effect depends on the productivity distribution when underreporting is low.

The intuition behind these results is that increasing the minimum wage effectively shrinks the choice set of workers declaring a sum between the new and the old minimum wage in the previous period, thereby making them worse-off. This prediction is different from the standard theory. In a standard model workers may loose their job due to a minimum wage hike and, in this case, their income would of course decline. However, if they keep their job, workers experience a wage hike and, therefore, an increase in income. This is not the case in this model. Even if workers keep their job, they experience a decline in income, as their nominal wage hike actually corresponds to an increase in fiscal liabilities. This prediction is tested in the following section.

IV. The empirical effect of a minimum wage hike on incomes

I test the prediction of the model by analyzing the effects of the massive increase in the minimum wage that took place in Hungary in 2001.

In Hungary underreporting of earnings is widespread. For instance, 56% of the households interviewed in a survey claim that in their neighborhood, employers are declaring the minimum wage to the tax authority, while unofficially paying additional wages[19] (ECONSTAT, 1999.) This may be related to the fact that taxation on labor is very heavy, also for low paid workers. In the period 2000-2002, the tax wedge on a single person without children earning 2/3 of the average production wage was at around 46%, i.e. one of the highest in Europe, with marginal rates above 55% (OECD, 2001 and 2002).

The statutory minimum wage[20] was increased from 25,500 HUF in 2000 (98 EUR or 90

19. The failure to correctly report tax liability involves the payment of a penalty corresponding to 50% of the tax evaded, plus late payment interest corresponding to twice the prime rate of the Hungarian National Bank, at around 11% in the period 2000-2001, for up to three years (OECD, 2004b). Economic organizations with legal entity status were in the period 2000-2001 subject to a 45% "audit intensity", defined as the number of completed audits in the tax year (without cash-flow audits) divided by the number of taxpayers in the given taxpayer group at the end of the previous year. The corresponding number for economic organizations without legal entity status was around 19% (APEH, 2006).

20. The statutory minimum wage covers all employment contracts and relates to gross monthly earnings net of overtime pay, shift pay and bonuses for full-time employment. For part-timers, it is proportionally lower, but part-timers only account for a small portion of all employees (3.6% in 2001-2002). Regarding contractual types, the only source of data I am aware of, the Hungarian Unemployment Insurance Exit to Job Survey, reports that 64.7% of the low-wage UI recipients who found a job in April 2001 received a fixed salary, 33.8% were paid an hourly wage and the remaining 1.5% concluded a business contract with the

USD using the average exchange rate for the corresponding year) to 40,000 HUF in 2001 (156 EUR, 140 USD.) As a consequence, the corresponding total monthly payments to the fiscal authorities (PIT and SSC) increased by around 9,000 HUF (36 EUR, 32 USD)[21]. It is interesting to notice how the hike was decided one-sidedly by the centre-right government, against the opposition of the largest trade union federation. The share of full-time employees paid 95%-105% of the minimum wage in firms employing more than five workers jumped from 5% in 2000 to 12.1% in 2001 (Kertesi and Köllő, 2003). The labor market impact of this massive hike was modest. Kertesi and Köllő (2003) compare the job loss risk of workers earning 90-110% of the minimum wage in 2001 to that of workers earning 110-125% and find only a small effect on the quarterly outflow into unemployment[22], while they find no effect on the flow from employment to non-participation. They also find a high level of compliance with the minimum wage regulation, with only a minor spillover on the wage distribution[23]. The conclusion of their study is that "despite the brutal price shock the immediate effect did not seem dramatic". Overall, in the period 2000-2001, the activity rate remained stable at around 60%, with unemployment declining from 6.4% to 5.7% and youth unemployment from 12.5% to 11.3% (see table 2 for more details).

Hungary is thus an ideal case to study the interaction between tax evasion and minimum wage: underreporting is widespread and in 2001 a massive minimum wage hike took place with a modest impact on the labor market. To the best of my knowledge, no other institutional change took place at the same time that may affect income or consumption. In what follows, I describe the empirical methodology and results.

employer (Kertesi and Köllő, 2003). Thus, the model assumption of a monthly minimum wage is well suited for the Hungarian case.

21. See table 1 for details.

22. For a 25-year old male with five years of tenure, for instance, the estimated quarterly flow is 0.243% for the treated and 0.119% for the control group. At average age and tenure of the control group (40, 7.33), the figures are 0.0168% for the treated and 0.0068% for the control group. Average age and tenure of the treatment group are not very different at 39.2 and 6.67, respectively. Notice that both these rates indicate rather long prospective tenures and thus a very modest job-loss risk, even for workers affected by the minimum wage.

23. Looking at the job finding probability, they find a 7-8% drop for the low-wage unemployed, defined as those receiving lower than average unemployment benefits, relative to the unskilled as a whole, defined as those with less than secondary education.

IV.A. The statistical framework

The prediction of the model derived in the previous section is that as a consequence of a minimum wage hike disposable income, I, declines for workers affected by the minimum wage hike, i.e. $\Delta I < 0$, while it does not change for unaffected workers. Disposable income is the sum of after-tax declared labor income, $(1-t)x$, other declared income and undeclared income. Affected workers who do not go completely underground experience an increase in after-tax declared income that is more than compensated by a decline in undeclared income, so that disposable income indeed declines. This is due to the fact that declaring previously undeclared income makes it subject to taxation.

Given that the empirical methodology is based on consumption data and that consumption is observed at the household level, the analysis is conducted at the household level. In particular, disposable income at the household level is the sum of disposable income for all household members, $Y = \sum_j I_j$, and equals the sum of after-tax declared income at the household level, Y^D, and undeclared income at household level, Y^U,

$$Y = Y^D + Y^U. \tag{12}$$

To test the prediction of the model, in the empirical analysis I first look at the dynamics of food consumption, as a proxy for the unobservable disposable income, for households that appear to benefit from the minimum wage hike, the treatment group, and for similar but unaffected households, the control group. The use of food consumption is standard in the literature estimating tax evasion by using household budget survey data. This is due to the fact that food consumption is more precisely recorded than consumption of other types of goods. This is the case also for the dataset used here: data on consumption of food and some other items, e.g. some types of clothing, come from a diary that each household keep in a given month during the year, while expenditures of more significant value are retrospectively collected for the year as a whole in subsequent interviews (see the Appendix and Kapitány and Molnár, 2004, for more details).

After analyzing food consumption, I look at the consumption-income gap function. The advantage of using the consumption-income gap is that it uses a more comprehensive measure of consumption and it eliminates the need to control for the possibly endogenous income change.

If households are credit constrained, then consumption for household i at time t, $C_{i,t}$, depends on disposable income, so that

$$C_{i,t} = Z_{i,t}\theta + \delta Y_{i,t} + error, \tag{13}$$

where $Z_{i,t}$ is a row vector of household characteristics. Taking first differences, I get

$$\Delta C_i = \Delta Z_i\theta + \delta \Delta Y_i + error, \tag{14}$$

and substituting expression (12) for disposable income,

$$\Delta C_i = \Delta Z_i\theta + \delta \Delta Y_i^D + \delta \Delta Y_i^U + error. \tag{15}$$

The change in unreported income, ΔY_i^U, is unobservable, but according to the theory, the minimum wage hike represents a shock to the "underreporting technology" for some households as some of their members are forced to decrease underreporting to remain employed in the formal labor market. Households unaffected by the minimum wage hike should instead not change their reporting behavior. This variation is used to identify the impact of the minimum wage on tax evasion. Thus, the following specification is estimated in the case of food consumption

$$\Delta C_i = \vartheta + \Delta Z_i\theta + \delta \Delta Y_i^D + \beta TREAT_i + \varepsilon_i, \tag{16}$$

whereas I estimate

$$\Delta C_i - \Delta Y_i^D = \vartheta + \Delta Z_i\theta + \beta TREAT_i + \varepsilon_i \tag{17}$$

when looking at the consumption-income gap. ΔC_i is the change in food consumption (when estimating (16)) or some aggregate measure of consumption (when estimating (17)) in two consecutive years, ϑ is a constant, $TREAT_i$ is an indicator of whether a given household have been affected by the minimum wage hike, the exact definition of which is provided in what follows, and ε_i is a random error term. This specification is similar to the one used in Johnson, Parker, and Souleles (2006) to study the impact of the 2001 federal income tax rebates on consumption expenditures. The coefficient of interest is β and the theory predicts

it to be negative.

If households are not credit constrained and consumption depends on permanent income, Y^P, then expressions (13) and (14) should have $Y_{i,t}^P$ instead of $Y_{i,t}$. Assuming the relationship between the change in permanent income and the change in disposable income is given by

$$\Delta Y_i^P = \lambda \Delta Y_i + error, \tag{18}$$

then (15) becomes

$$\Delta C_i = \Delta Z_i \theta + \lambda \delta \Delta Y_i^D + \lambda \delta \Delta Y_i^U + error \tag{19}$$

and can still be estimated through (16) and (17). The difference is that now in ε_i there is also the error term from expression (18). Particular care must thus be taken not to confound the shock to the ability to underreport with other shocks to permanent income related to the minimum wage hike due, for instance, to increased labor market risk. For this reason, I consider in the analysis only employees who remained employed for at least 12 months after the hike: their employment status is clearly not adversely affected by the minimum wage hike in this period. Also, in some specifications, I control for a rich set of employee characteristics and geographical dummies, thus controlling for possible shocks along these dimensions. Moreover, I conduct a separate analysis for the subsamples of skilled and unskilled/semi-skilled workers affected by the hike. If the negative treatment effect is due to increased labor market risk, then unskilled/semi-skilled workers should be more affected compared to skilled workers. Instead, what I find is the opposite, with skilled workers experiencing a negative treatment effect, while the less productive unskilled/semi-skilled workers are not affected. This is consistent with the relatively more productive skilled workers receiving part of their compensation in cash, while unskilled/semi-skilled may be genuinely earning the minimum wage.

The preferred specification is in levels as the shock to underreporting is not proportional to income but absolute. According to the model, every worker declaring the minimum wage in 2000 and then increasing his declaration to the new minimum in 2001 experiences a decline in his income of around 9,000 HUF, irrespective of differences in the income level that may arise from the availability of other sources of income or heterogeneity in the degree of underreporting. However, I also report the results for a log specification, using $\Delta \ln C_i$

and $\Delta \ln Y_i^D$. A log specification is less sensitive to outliers and, in the analysis of the consumption-income gap, the assumption of unitary income elasticity of consumption may be more appealing than the assumption of an unitary ratio.

All regressions include a set of dummies allowing for different trends depending on the months in which the household is surveyed in two consecutive years. These dummies control for time shocks, e.g. seasonal fluctuations in food prices. As already mentioned, a set of regressions also includes controls for all employee characteristics available in the dataset (sector of employment, position, type of employer), for geographical characteristics (county and type of settlement) and demographic characteristics (age and gender of household members). These variables control, for instance, for labor market shocks that are specific to a given sector or to a specific area of the country or for differences in food inflation among different types of settlements, e.g. cities or villages.

The exact definition of all variables is provided in the Appendix.

IV.B. Empirical implementation

I use data from the Hungarian Household Budget Survey Rotation Panel[24], in particular the 2000-2001 panel. More information about the way the survey is conducted is available in the Appendix and in Kapitány and Molnár (2004). It is worth underlining that surveyors are expected to collect the income data from documentation like the tax return sheet or the tax certification of employer. This makes it more likely that income in the survey corresponds to income reported to the fiscal authorities, rather than to the possibly different true income. The distribution of earnings in the dataset (see figure 2) clearly presents a spike at the minimum wage level. This corresponds to 5% in 2000 and increases to around 14% in 2001. These figures are consistent with LFS data and underline the relevance of the minimum wage hike.

I consider a household as treated if at least one of its members has been affected by the minimum wage hike. In particular, the variable $TREAT_i$ contains the total number of members of household i classified as private sector employees (see Appendix for exact definitions) who have been employed for the whole period and who in the year 2000 earn

24. The Hungarian Household Budget Survey Rotation Panel is created by the Institute of Economics (IE), Hungarian Academy of Sciences from the original HHBS of the Hungarian Central Statistical Office. The data set is work in progress. The IE made every effort to clean the data and it cannot be held liable for any remaining errors.

a wage between the minimum wage in that year (25,500 HUF) and the will-be minimum wage in the year 2001 (40,000 HUF). I also report results from an alternative specification in which $TREAT_i$ is a dummy variable indicating whether a household has at least one member satisfying the abovementioned criteria. The control group is represented by households not in the treatment group where at least one member has been employed for the whole period and whose wage in 2000 is between the minimum wage in 2000 and 200% of the will-be minimum wage in 2001. The treatment group and control group are thus only defined on the basis of pre-treatment characteristics. I consider only employees with stable positions, i.e. employees who have been employed for the whole of 2000 and who keep their job for at least 12 months after the minimum wage hike, to avoid confounding an increase in labor market risk with an increase in compliance with fiscal regulation. To ensure comparability, I restrict the analysis to households that kept a constant composition and that have a positive monthly net income below 200,000 HUF at 2000 prices (approx. 770 EUR). I also consider a specification in which I further restrict the sample to households with monthly net income between 50,000 HUF (approx. 190 EUR) and 150,000 HUF (approx. 580 EUR) at 2000 prices

I also employ an alternative definition of treatment, in which the variable $TREAT_i$ is the sum within household i of the difference between the minimum wage in 2001 and earnings in 2000 for all members of the household defined as treated according to the previous criteria. The aim of this continuous measure is to capture the intensity of treatment. I label this definition of treatment "continuous".

Exit from the labor market As mentioned earlier, I do not consider workers who loose their job after the minimum wage hike. A drop in income for this type of workers can be easily explained by their job loss and would be a confounding factor to detect the alternative explanation proposed here, namely the fact that there is a fall in the effective wage due to a reshuffling between declared and undeclared earnings. However, following a minimum wage hike, the model also predicts some exit from the formal labor market, either to the informal labor market or to inactivity and here I will briefly look at this aspect.

Looking at the impact of the minimum wage on the probability of becoming unemployed[25],

25. Formally, unemployed people are not outside of the official labor market. However, none of the subjects under consideration are classified in 2001 as "person with no intention to work".

of the 301 individuals who were employed in the private sector for the whole of 2000 at a wage between the minimum wage in 2000 and the will-be minimum wage in 2001, 6.6% (20 individuals) were unemployed in 2001. The figure is slightly higher for skilled workers (7.5%, 11 out of 135) than for unskilled or semi-skilled workers (6.5%, 8 out of 115), while it is lower (3.1%, 1 out of 31) for workers with higher occupations. A probit analysis shows that, among those having a stable position in 2000, the probability of being unemployed in 2001 is, after controlling for a rich set of variables[26], 0.031 (s.e. 0.017) higher for whose with a wage in 2000 between 25,500-40,000 HUF, compared to whose with a wage between 40,000-80,000 HUF. This figure is 0.038 (s.e. 0.028) for skilled worker and 0.003 (s.e. 0.013) for unskilled or semi-skilled workers. An increase in the probability of being unemployed is consistent with the model, but is of course also the standard prediction of most labor market models, in particular taking into account the size of the minimum wage hike.

One aspect to underline here is that workers who do not loose their job after the minimum wage hike are the ones more likely to receive a cash side-payment. This is because unreported income may act as a buffer to absorb the minimum wage shock. Such a buffer is not available to workers complying with fiscal regulation, who are thus more likely to become unemployed. Therefore, to correctly interpret the results, it should be taken into account that side payments are likely to be more common in the sample used for the analysis than for the population of workers as a whole, even if, given the limited effect of the minimum wage on unemployment described above, this sample selection issue may not be very serious.

Descriptive Statistics Households in the treatment and in the control group are quite similar (see Table 3). In 2001 income of households in the treatment group is 95% of income of households in the control group for the sample as a whole and indeed there is considerable overlap in the distribution of income (see figure 3). This is due to the fact that workers affected by the minimum wage are not the sole earners in the household. Indeed, in Hungary "minimum wage earners are typically not the primary earners – the breadwinners – in their families, and they do not typically fall within the poorest fifth of the population" (Benedek et al., 2006). Both types of household spend around 25% of net income in food and the estimated relationship between food consumption and income is very similar, particularly in the pre-treatment period and for the unskilled/semi-skilled (see figure 4).

26. Age, age square, gender, county, type of settlement, family status, sector, position, education.

Food Consumption Here, I report estimation results for equation (16). I also report results without controlling for income change. To deal with the possible correlation between the treatment and the error term due, for instance, to a mean-reverting transitory component of income or to changes in the distribution of income (Auten and Carroll, 1999; Gruber and Saez, 2002; Kopczuk, 2005), in some specifications I also control for the initial level of income. I report results controlling only for time dummies or also for geographical, demographical and employee characteristics.

As predicted by the theory, the estimation results show that the coefficient of the treatment variable is always negative. When using the whole sample, the coefficient is always statistically significant both when using the baseline specification, where the treatment is the number of household members affected (Table 4, upper part), or the dummy specification, where the treatment indicates whether or not an household has at least one treated member (Table 10, upper part), or the continuous specification, where the treatment is the sum within each household of the difference between the minimum wage in 2001 and the wage in 2000 for treated employees (Table 16, upper part). When using a log specification (Tables 7 and 13) or when using the sample restricted to households with an income between 50,000-150,000 HUF (Tables mentioned above, lower part), the coefficient is usually statistically significant only when controlling for employee, geographical and demographic characteristics.

To check for the validity of the control group, I also conduct a "placebo test" where I ascertain the absence of a treatment effect in the pre-policy period. For this purpose, I replicate the analysis by looking at changes in food consumption in the period 1999-2000. The results are reported in the middle part of each of the tables discussed above. This placebo test confirms the validity of the control group, as the dynamic of food consumption did not differ between the treatment and control group in the pre-treatment period 1999-2000.

Finally, I replicate the whole analysis by looking at two subsamples. In the first subsample, I restrict attention only to skilled workers, to define both the treatment and the control group. In the second subsample, I restrict attention only to unskilled and semi-skilled workers. The first subsample includes more than 50% of the treated household in the original sample, while the second subsample more than 40%. What clearly emerges from this analysis is that the results for the sample as a whole are driven by skilled workers. Indeed, for skilled workers the treatment coefficient is always negative, larger in absolute value than for the

sample as a whole and usually strongly significant. For unskilled and semi-skilled worker, the treatment coefficient is instead of much smaller magnitude, often positive and never statistically significant. This pattern is consistent with the enforcement role of the minimum wage proposed here. Indeed, skilled workers are more likely to receive a higher compensation due to their higher productivity and, thus, if they declare a wage close to the minimum wage, to receive additional payments in cash. Therefore, in the case of skilled workers, an increase in the minimum wage is more likely to represent an increase in fiscal liability. Instead, unskilled and semi-skilled workers have lower productivity and thus they are less likely to receive additional side payments over and above the declared minimum wage. Notice also that the interpretation of the negative coefficient of the treatment variable as due to increased labor market risk would imply the opposite pattern, with unskilled and semi-skilled workers being more affected than skilled workers.

Consumption-Income Gap Here, I report estimation results for equation (17). I report results for the combination of two different measures of consumption, C_1 and C_2, and two different measures of income, Y_1 and Y_2. C_1 is consumption of non-durable goods, while C_2 also includes transfers payments (e.g. maintenance for child outside the household), as in Gorodnichenko et al. (2009). Y_1 is regular labor and nonlabor income, while Y_2 adds irregular receipts (e.g. income from the sales of belongings), as in Gorodnichenko et al. (2009). See Appendix for details. I report results controlling only for time dummies (Time controls) or also for geographical, demographical and employee characteristics (Full controls). I report results for all three definitions of treatment (baseline, dummy and continuous), both for the specification in levels (upper part of each table) and, for the baseline and dummy treatments, also for the specification in logs (lower part of each table). Beside results for the whole sample, I report, as in the analysis of food consumption, results restricted to households with income between 50,000-150,000 HUF and for the subsamples of skilled workers and unskilled/semi-skilled workers.

As predicted by the theory, the coefficient of the treatment variable is always negative. For the sample as a whole (Table 19), statistical significance is achieved mainly for the baseline treatment specification and for the log specification. As in the case of food consumption, the analysis of subsamples clearly indicates that skilled workers (Tables 21 and 22) are the ones affected by the treatment, while unskilled/semi-skilled are not (Tables 23 and 34).

So, all in all, the analysis of the Consumption-Income gap confirms the results derived from the analysis of food consumption.

Robustness checks I repeated the main analysis for two fictitious minimum wage hikes: an increase from 50,000 HUF to 64,500 HUF and an increase from 50,000 HUF to 78,431 HUF. The starting point of 50,000 HUF has been chosen so that there is no overlap between individuals affected by the real hike and the ones considered to be affected by the fictitious hike. The end points have been chosen so that the absolute difference between the two minimum wages or their ratio is the same as in the real case. All other quantities have been modified accordingly. For these two fictitious cases (results not reported), the treatment is neither consistently negative, nor significant, irrespective of the different treatment definitions used. This indicates that the treatment effect found in the main analysis is not a statistical artifact or due to a comparison of households in different positions in the income distribution, but is indeed due to the minimum wage hike.

To summarize, treated households experience a significant drop in their consumption compared to households in the control group. This is the case even if they appear to actually benefit from the minimum wage hike, in that their reported net income increases more than for the control group, both in absolute and in relative terms. Moreover, the fact that the effect is due to the skilled workers subsample excludes the alternative explanation of an adverse labor market effect of the minimum wage. Thus, we can conclude that the empirical analysis supports the theoretical prediction about the minimum wage impact on fiscal compliance.

V. Conclusions

This paper examines an aspect of minimum wage policy that has not been investigated before, by looking at its interaction with tax evasion by employed labor. There are important policy implications for countries where underreporting of earnings is a relevant phenomenon. On the one hand, if the aim of the minimum wage hike is to boost income for those affected, as is often claimed when such policies are introduced, the policy move could have opposite consequences, if no corrective measures are taken on the fiscal side. An increase in officially reported income could actually correspond to a decrease in true income, unless the minimum

wage hike is accompanied by a decrease in fiscal pressure for minimum wage earners. On the other hand, if the aim is to contrast underreporting of earnings, introducing or increasing the minimum wage may represent an effective measure that may prove to be cost effective as compared to more direct measures aimed at fighting the black economy, such as hiring new tax inspectors. The minimum wage targets the lower end of the productivity distribution, but this may be desirable as there is some evidence that tax evasion among employees is concentrated here (Lemieux et al. [1994]; Fiorio and D'Amuri [2005]). Admittedly, the minimum wage represents a rather blunt instrument to fight underreporting, but it may be sharpened by differentiating it along dimensions related to productivity (see for instance the Bulgarian experience [Koleva, 2007; Neykov, 2003]).

There are also implications for the most researched aspect of minimum wage policy, i.e. its effect on employment. Unreported income may act as a buffer to absorb minimum wage shocks, implying that the employment effect of a minimum wage hike would be smaller in countries with a high degree of informality compared to countries where the degree of informality is lower. An example of this is the subdued employment effect of the massive minimum wage hike that took place in Hungary in 2001. Another implications is that a high spike at the minimum wage level may not be due to a relatively high and binding minimum wage, but to a high degree of informality. Some supportive cross-country evidence for European countries is presented in Tonin (2007). The paper also contributes to the literature on tax evasion by introducing a new and simple way of modelling it, based on the idea that detection is not perfect. This can be used to study other aspects of reporting behavior and tax enforcement.

Appendix

Proof of Proposition 1:

For low productivity workers, I get income in case of work in the black market, i.e. full evasion, from (10),

$$I_{bm} \equiv y_i \left[1 - t/\left(2\alpha\right)\right]. \tag{20}$$

To simplify notation, Income in case of inactivity is assumed to be 0 and utility to be $-\bar{u}L$. The labor market status is then chosen by comparing utility in the two cases, giving the following condition

$$I_{bm} > 0 \Leftrightarrow \alpha > t/2.$$

Intermediate productivity worker satisfy the following condition,

$$(1-\alpha)y_i \leq \varpi \leq y_i \Leftrightarrow \varpi \leq y_i \leq \varpi/(1-\alpha). \tag{21}$$

Their income in case of declaring ϖ is given by substituting $x = \varpi$ in (7) and (6)

$$I_{mw} \equiv y_i(1-t) + (y_i - \varpi)\,t - t\,(y_i - \varpi)^2/(2\alpha y_i). \tag{22}$$

Declaring a wage higher than the minimum is never optimal for this group. Moreover, as $I_{mw} > 0$ for productivities satisfying (21), these workers will never go into inactivity. The choice is thus between declaring the minimum wage or working in the black market and declaring 0. The comparison between income in case of declaring the minimum wage and income in the black market as given by (20) gives the following condition

$$I_{mw} \geq I_{bm} \Leftrightarrow y_i \geq \varpi/[2(1-\alpha)] \equiv y_{mw}. \tag{23}$$

As the choice between employment at the minimum wage and employment in the black market is only relevant for workers satisfying (21) to determine the behavior once a minimum wage is introduced, it is necessary to position y_{mw} in the interval $[\varpi, \varpi/(1-\alpha)]$. The threshold y_{mw} is greater than the minimum wage if and only if $\alpha > 1/2$, while it is always the case that $y_{mw} < \varpi/(1-\alpha)$. Thus, if the degree of underreporting is high, i.e. $\alpha > 1/2$, the threshold y_{mw} is internal to the interval defined by condition (21). This implies that some of the workers affected by the minimum wage and with a productivity higher than the minimum wage prefer to decrease evasion and declare the minimum, while others prefer to go into the black market. If the degree of underreporting is instead low, i.e. $\alpha \leq 1/2$, all workers affected by the minimum wage and with a productivity higher than the minimum wage prefer to increase compliance and declare the minimum.

Proof of Proposition 3:

Suppose that in the first period, the minimum wage is ϖ_1, increasing to $\varpi_2 > \varpi_1$ in the second period. The change in income due to the minimum wage hike is $\Delta I = I_2 - I_1$, where I_t is income in period t.

If a worker already operates in the underground market or declares earnings above ϖ_2 in the first period, he will not change his behavior after the minimum wage hike and thus, his income remains unchanged, $\Delta I = 0$. A worker whose official earnings are exactly equal to the minimum wage in the first period, ϖ_1, may experience an increase in declared earnings to ϖ_2, with a corresponding income change of

$$\Delta I = -t\left(\varpi_2 - \varpi_1\right)\left[\varpi_2 + \varpi_1 - 2y(1-\alpha)\right] / \left(2\alpha y\right) < 0 \ ^{27}.$$

Alternatively, his declared earnings may decrease to 0. The income change in this case is given by

$$\Delta I = t\varpi_1\left[\varpi_1 - 2y(1-\alpha)\right] / \left(2\alpha y\right) < 0 \ ^{28,29}.$$

In any case, the minimum wage hike results in an income decline for this type of worker. The last type of worker to be analyzed here is the one with declared earnings between the old and new minimum wage in the first period. Also in this case declared earnings may increase in the second period to ϖ_2, resulting in an income drop given by

$$\Delta I = -t\left[y\left(1-\alpha\right) - \varpi_2\right]^2 / \left(2y\alpha\right) < 0,$$

or decrease to 0, with the corresponding income change given by

$$\Delta I = -ty\left(1-\alpha\right)^2 / \left(2\alpha\right) < 0 \ ^{30}.$$

Notice that the decline in income for workers declaring ϖ_2 in the second period increases as the distance between the declared income in the first period and ϖ_2 increases. Thus, a worker

27. This is due to the fact that workers in this situation have productivity y_i s.t. $\left(1-\alpha\right) y_i \leq \varpi_1 < \varpi_2$.

28. This is due to the fact that workers in this situation have productivity y_i s.t. $y_i > \varpi_1$ if $\alpha \leq 1/2$ and $y_i > \varpi_1 / \left[2(1-\alpha)\right]$ if $\alpha > 1/2$.

29. This assumes that workers go underground. If $\alpha < t/2$, so that workers withdraw from the labor market, the decline in income is obvious.

30. See previous note.

who was declaring marginally above the minimum wage ϖ_1 in the first period and increases his declaration to ϖ_2 experiences a larger income decline than a worker also declaring ϖ_2 in the second period, but whose declared income in the first period was higher. The income decline is even larger for workers who declared the minimum wage in the first period.

The survey and main variables

The sample consists of around 10,000 households. One third of the sample is rotated in each year. The two-year panels of interest for this study, i.e. 1999-2000 and 2000-2001, contain slightly more than 3,500 households. Notice that households interviewed from 1999 till 2001 appear in both panels, so that around half of the sample is the same in the two panels. The population of interest is considerably reduced by the fact that all adults are retirees in around 40% of the households. A household consists of individuals forming a common income and/or consumption unit, completely or partly sharing the current costs of living. The selection of the sample is done by multistrata method using census data. In a given month during the year, households keep a diary registering income and expenditures during the month and "general household characteristics" containing demographic, employment and housing data. In subsequent interviews, data on personal incomes, family income, stock of consumer durables, expenditures of significant value, are retrospectively collected for the year as a whole. The main variables and categories used are:

- "Households with constant family structure" are households where the same individuals are present for the relevant period. Restricting the analysis to this type of household reduces the sample in the panel 1999-2000 from 3581 to 3181, with a loss of 400 households, for the panel 2000-2001 the loss is of 329 households, from 3529 to 3200. The advantage of only using such households is that exactly the same individuals are observed in two subsequent years.

- In all regressions I include a set of dummies capturing the month of diary keeping. So, for instance in the panel 2000-2001, there is a dummy for households that kept the diary in January 2000 and January 2001 and a different dummy for households that kept the diary in January 2000 and February 2001. Potentially, there are 144 month dummies. However, in both panels, around 70% of the households kept the diary in the same month in both years.

- "Employees" are defined as employees in public or private enterprises, institutions, co-operatives, private entrepreneurs or societies (firms owned by several private entrepreneurs) with positive earnings from their main activity during the year and positive months when earnings from the main activity have been realized. "Public employees" are defined as employees in the category "public or private enterprises, institutions", active in public administration and defence, compulsory social security, education, or health and social work. "Private employees" are all employees who are not public employees. The dataset contains the number of months in which earnings from the main activity have been realized during the year. If in a given year the number of months corresponds to twelve, the employee is considered to have been employed the whole year.

- Employee characteristics include three sets of dummies, describing the labor market characteristics of employees in the households.

    1. Sectoral: =1 for each of the 16 NACE categories if there are employees in the household working in that category (e.g. Electricity, gas and water supply);

    2. Position: =1 for each of the 10 categories characterizing the hierarchical position[31] if there are employees in the household belonging to that category (e.g. skilled worker);

    3. Type of employer: =1 if there are employees in the household working for category of employers[32] (e.g. private entrepreneurs);

- Geographical dummies include a set of dummies for the 20 counties into which Hungary is divided and a set of dummies capturing whether the household's place of residence is the capital, a large city, a town or a village. Note that by construction, in subsequent years the survey only includes households whose place of residence did not change.

31. top leader; leader, manager; employee with diploma; employee with secondary qualification; administrative employee; skilled worker; semi-skilled worker; unskilled worker; self-employed; family helper.

32. In 1999, the following three categories are listed: 1. public or private enterprises, institutions; 2. cooperatives, firm owned by several private entrepreneurs; 3. private entrepreneurs.
In 2000 and 2001, the following four categories are listed: 1. public or private enterprises, institutions; 2. cooperatives; 3. private entrepreneurs; 4. firm owned by several private entrepreneurs.

- Demographic characteristics include variables indicating the number of household members with age 0-5, 6-20, 21-35, 36-50, 51-65, >65 and the number of male household members.

- Consumption and income variables:

    1. Food consumption is built from a detailed list (e.g. eggs, whole milk, skimmed milk). For each item there is a distinction between own production and purchased.

    2. C_1 includes food, beverages and cigarettes, clothes, energy, water, rent, transport, heatlh and personal care, communication, culture and recreation, and other personal cost. Both purchased and own production are included. It does not include durables like furniture and applicances, vehicles.

    3. C_2 also includes outgoing household transfers, both in cash and in kind.

    4. Y_1 includes household level income (various forms of child-related income, e.g. family allowance, social assistance, e.g. food support, and other sources of income, e.g. income from dividends or interest), income from own production, including own production of food, and the sum of net personal incomes of household members, e.g. income from main activity, self-employment, authorship, where paid social security contributions and personal income tax are subtracted from gross personal income to obtain net personal income. This is the measure of income used to select the sample (households with positive income below 200,000 HUF and households with income between 50,000-150,000 HUF at 2000 prices, deflated using CPI). For the analysis of food consumption, income not including own production is used as a control variable.

    5. Y_2 also includes irregular receipts, e.g. income from sales of belonging and non-refundable social loans for housing.

References

Andreoni, J., Erard, B., and Feinstein, J. (1998), "Tax compliance", *Journal of Economic Literature*, Vol. 36, pp. 818-860.

APEH (2006), *Bulletin*, Budapest.

Auten, G. and Carroll, R. (1999), "The effect of income taxes on household income", *The Review of Economics and Statistics,* vol. 81(4), pp. 681-693.

Benedek, D., Rigo, M., Scharle A. and Szabo P. (2006), "Increases in the minimum wage in Hungary, 2001-2006", Ministry of Finance Working Paper n° 16.

Besim, M., and Jenkins, G.P. (2005), "Tax compliance: when do employees behave like the self-employed", *Applied Economics*, vol. 37, pp. 1201-1208.

Brown, C. (1999), "Minimum wages, employment, and the distribution of income", *Handbook of Labor Economics*, vol. III, Elsevier, Amsterdam.

Card, D., and Krueger, A. (1995), *Myth and measurement*, Princeton University Press, Princeton, NJ.

Dickens, R., and Manning, A. (2004), "Spikes and spill-overs: the impact of the national minimum wage on the wage distribution in a low-wage sector", *Economic Journal*, vol. 114, pp. 95-101.

DiNardo, J., Fortin, N., and Lemieux, T. (1996), "Labor market institutions and the distribution of wages, 1973-1992: a semiprametric approach", *Econometrica*, vol. 64(5), pp. 1001-1044.

Draca, M., Machin, S., and Van Reenen, J. (2006), "Minimum wage and firm profitability", IZA DP 1913.

ECONSTAT (1999), "A lakosság részvétele a rejtett gazdaságban", *Időszaki Közlemények 18.*

Erard, B. (1997), "Self-selection with measurement errors. A microeconometric analysis of the decision to seek tax assistance and its implications for tax compliance", *Journal of Econometrics*, vol. 81, pp. 319-356.

Eurostat (2006), "Small decline in overall taxation to 39.3% of GDP in 2004", *News Release 62/2006.*

Eurostat (2007), "Undeclared Work in the European Union", *Special Eurobarometer 284.*

Falk, A., Fehr, E., Zehnder, C. (2004), "Fairness Perceptions and Reservation Wages - The Behavioral Effects of Minimum Wage Laws", *The Quarterly Journal of Economics,* vol. 121(4), pp. 1347-1381.

Feinstein, J. (1991), "An econometric analysis of income tax evasion and its detection", *RAND Journal of Economics*, vol. 22, pp. 14-35.

Feldman, N., and Slemrod, J. (2007), "Estimating tax noncompliance with evidence from unaudited tax returns", *The Economic Journal*, vol. 117(518), pp. 327-352.

Fiorio, C., and D'Amuri, F. (2005), "Workers' tax evasion in Italy", *Giornale degli Economisti e Annali di Economia*, vol. 64(2/3), pp. 241-264.

Gorodnichenko, Y., Martinez-Vazquez, J., and Sabirianova Peter, K. (2009), "Myth and reality of flat tax reform: Micro estimates of tax evasion and productivity response in Russia", *Journal of Political Econom,* vol. 117(3), pp. 504-554.

Gorodnichenko, Y., and Sabirianova Peter, K. (2007), "Public Sector Pay and Corruption: Measuring Bribery from Micro Data", *Journal of Public Economics,* vol. 91(5-6), pp. 969-991.

Gruber, J. and Saez, E. (2002), "The elasticity of taxable income: evidence and implications", *Journal of Public Economics,* vol. 84(1), pp. 1-32.

Johnson, D., Parker, J., Souleles, N. (2006), "Household Expenditure and the Income Tax Rebates of 2001", *American Economic Review*, 96(5), pp 1589-1610.

Kapitány, Zs., and Molnár, Gy. (2004), "Inequality and income mobility in Hungary: 1993-1998", *Europe-Asia Studies*, vol. 56(8), pp. 1109-1129.

Kertesi, G., and Köllő, J. (2003), "Fighting "low equilibria" by doubling the minimum wage? Hungary's experiment", IZA DP No. 970.

Klepper, S., and Nagin, D. (1989), "The anatomy of tax evasion", *Journal of Law, Economics, and Organization*, vol. 5(1), pp. 1-24.

Kleven, H., Thustrup Kreiner, C., and Saez, E. (2009), "Why Can Modern Governments Tax So Much? An Agency Model of Firms as Fiscal Intermediaries", NBER Working Paper No. 15218.

Koleva, N. (2007), "Social partners agree minimum social security thresholds", EIRO, www.eiro.eurofound.eu.int.

Kolm, A. and Nielsen, S. (2008), "Under-reporting of income and labor market performance", *Journal of Public Economic Theory*, vol. 10(2), pp. 195-217.

Kopczuk, W. (2005), "Tax Bases, Tax Rates and the Elasticity of Reported Income," *Journal of Public Economics*, vol. 89(11-12), pp. 2093-2119.

Lee, D., and Saez, E. (2010), "Optimal Minimum Wage Policy in Competitive Labor Markets", mimeo.

Lemieux, T., Fortin, B., and Frechette, P. (1994), "The effect of taxes on labor supply in the underground economy", *American Economic Review*, vol. 84(1), pp. 231-54.

Lemos, S. (2008), "A Survey of the Effects of the Minimum Wage on Prices", *Journal of Economic Surveys,* vol. 22(1), pp. 187-212.

Marion, J., & Muehlegger, E. (2008), "Measuring Illegal Activity and the Effects of Regulatory Innovation: Tax Evasion and the Dyeing of Untaxed Diesel", *Journal of Political Economy*, vol. 116(4), pp. 633-666.

McIntyre, F. (2006), "An empirical model of illegal work", mimeo.

Neykov, I. (2003) "New legislation on minimum social insurance thresholds and registration of employment contracts", EIRO, www.eiro.eurofound.eu.int.

OECD (2001), *Taxing wages 2000-2001*, OECD, Paris.

OECD (2002), *Taxing wages 2001-2002*, OECD, Paris.

OECD (2003), *labor market and social policies in the Baltic countries*, OECD, Paris.

OECD (2004a), *Employment Outlook*, OECD, Paris.

OECD (2004b), *Tax Administration in OECD Countries: Comparative Information Series*, OECD, Paris.

Petrova, A. (2005), "Wages: On the Payroll or Under the Table?", *Public Opinion Foundation*, Moscow.

Pissarides, C., and Weber, G. (1989), "An expenditure-based estimate of Britain's black economy", *Journal of Public Economics*, vol. 39, pp. 17-32.

Schneider, F., and Enste, D. (2000), "Shadow economies: size, causes, and consequences", *Journal of Economic Literature*, vol. 38(1), pp. 77-114.

Simon, K.I., and Kaestner, R. (2004), "Do minimum wages affect non-wage job attributes? Evidence on fringe benefits", *Industrial and Labor Relations Review*, vol. 58, pp. 52-70.

Slemrod, J., and Yitzhaki, S. (2002), "Tax avoidance, evasion, and administration", in: Auerbach, A., Feldstein, M. (eds.) *Handbook of Public Economics*, vol. III, Elsevier, Amsterdam.

Tonin, M. (2007), "Essays on Labour Market Structure and Policies", Stockholm University, Stockholm.

World Bank (2005), *Enhancing Job Opportunities: Eastern Europe and the Former Soviet Union*, World Bank, Washington, DC.

_. (2006), *Turkey. Country Economic Memorandum*, World Bank, Washington, DC.

_. (2007), *Informality: Exit and Exclusion*, World Bank, Washington., DC.

Figures

Figure 1: Disposable Income (I) and Declared Income (x)

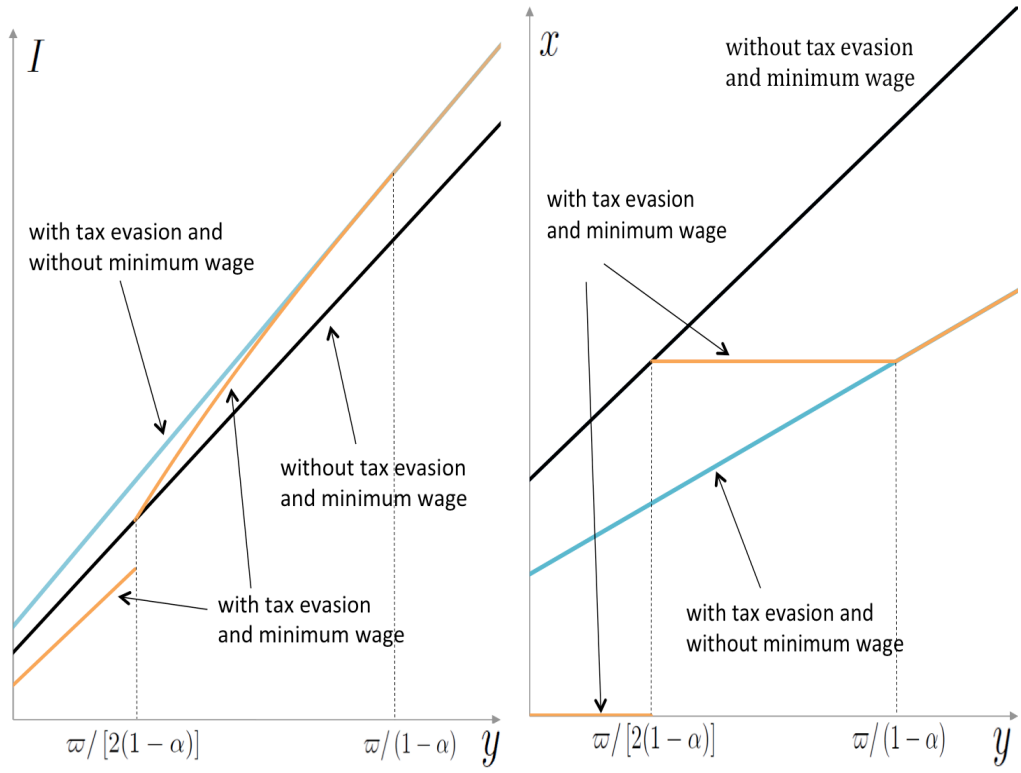
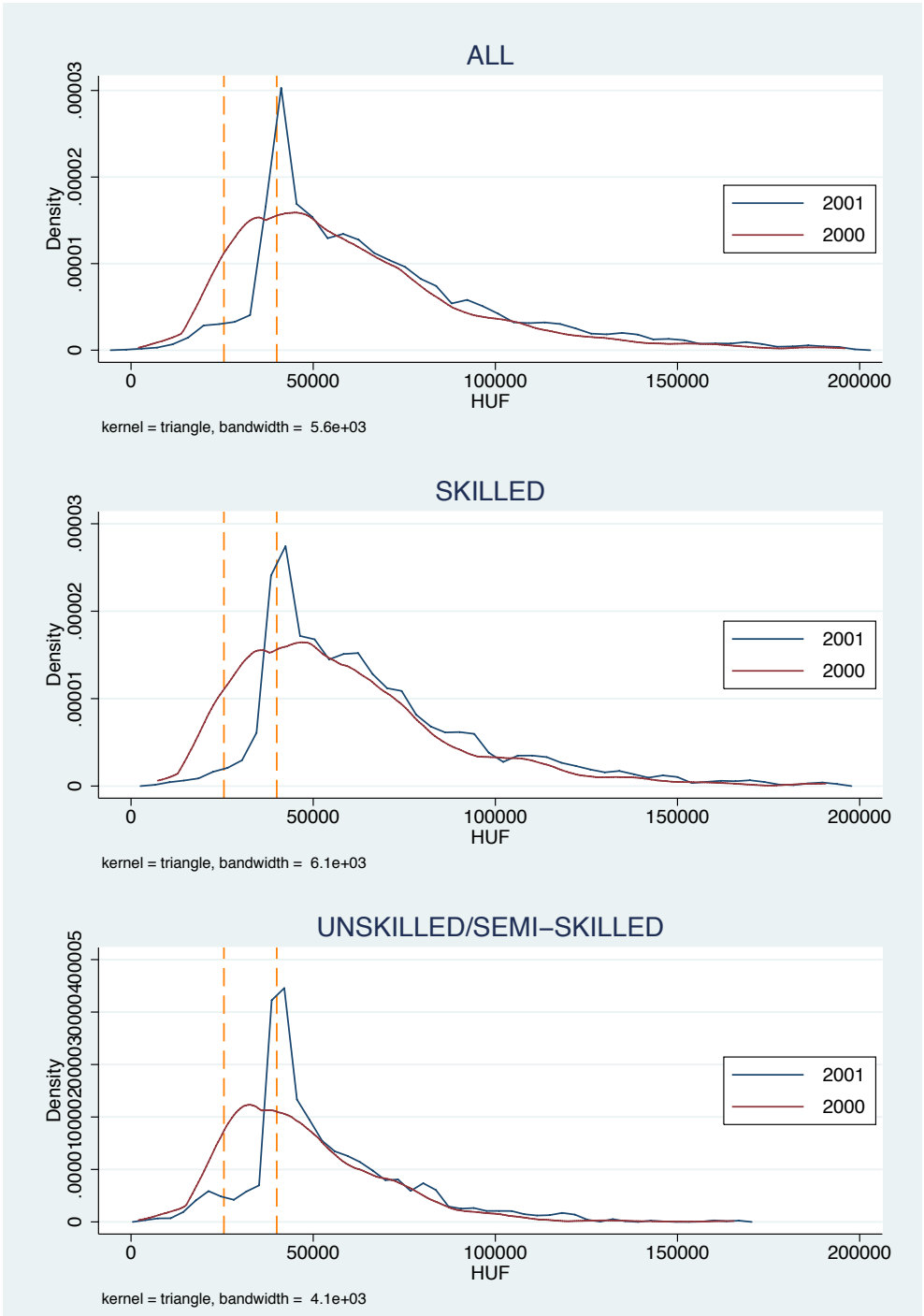


Figure 2: Earnings From Main Activity



The vertical lines indicate the MW in 2000 (25000) and 2001 (40000)

Figure 3: Household Income Distribution

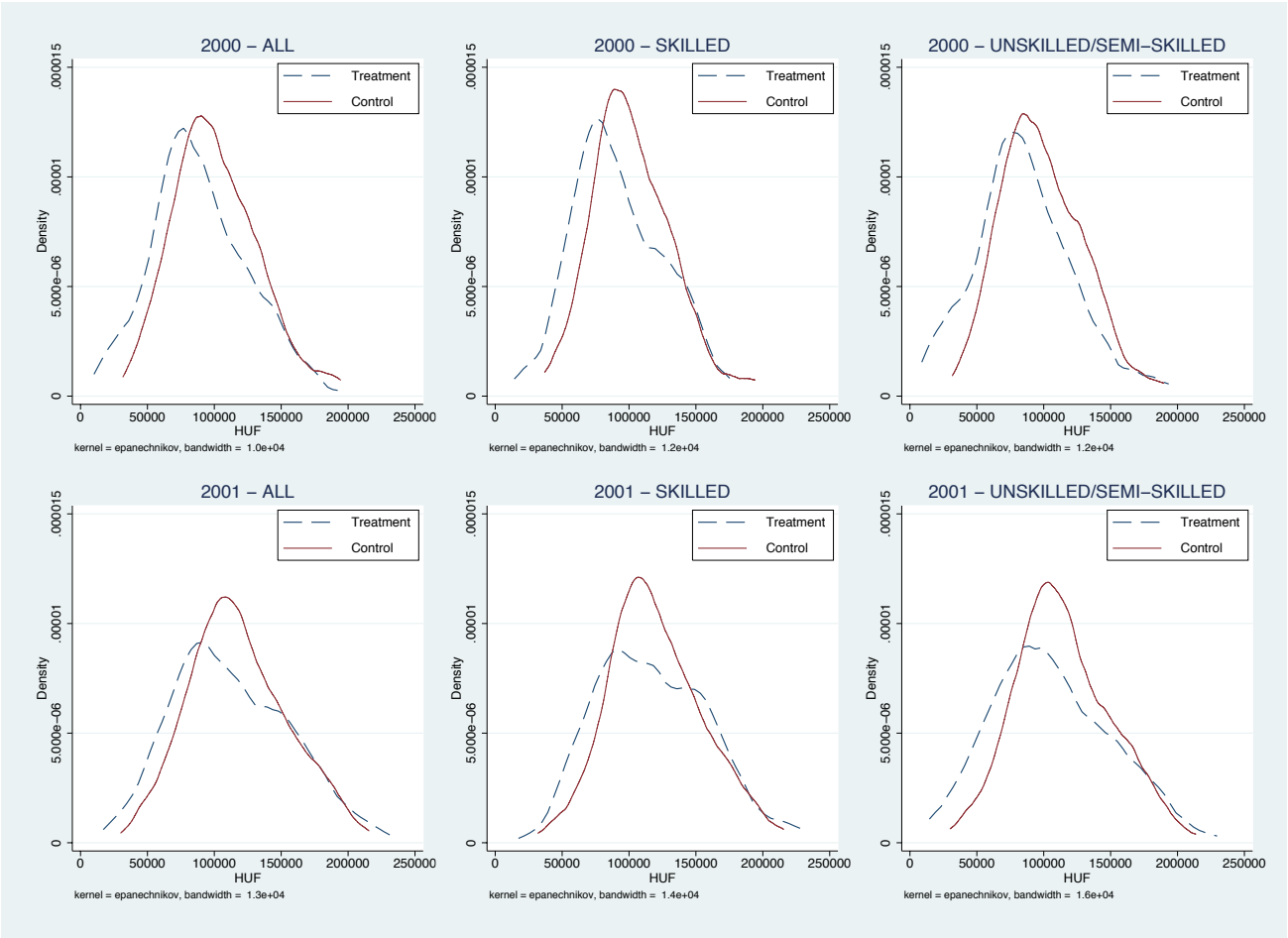
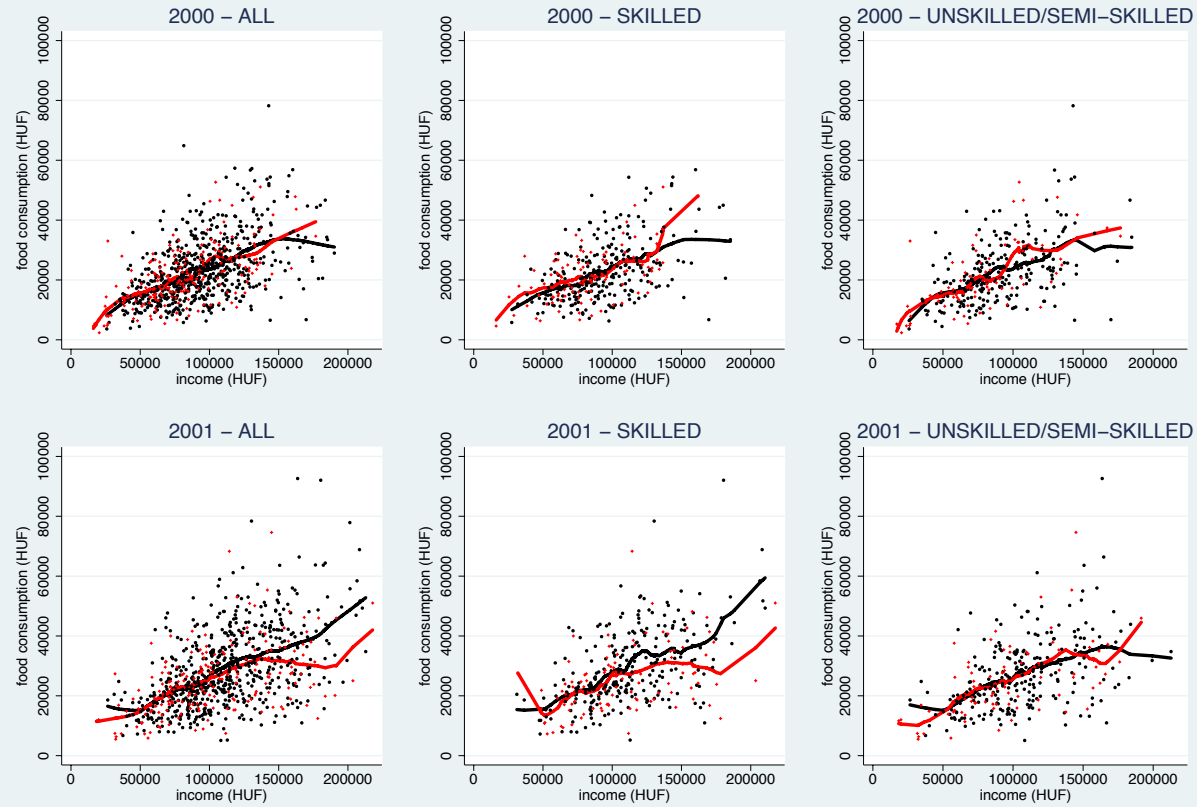


Figure 4: Food Consumption and Income



Lowess smoothing (bandwidth: 0.25). Red: treatment group; Black: control group

Tables

Table 1: Tax Wedge on Minimum Wage

		2000	2001
Monthly minimum wage (gross)		**25500**	**40000**
		98 €	156 €
Personal income tax rate at minimum wage		20%	20%
Tax credit	- Rate	10%	10%
	- Monthly Maximum	3000	3000
	- Applicable at minimum wage	2550	3000
Pension contribution deduction	- Rate	25%	25%
	- Rate*Employee Pension Rate	2%	2%
Net personal income tax at minimum wage		2040	4200
Total social security contributions employees	- Rate	12.50%	12.50%
	- Payment	3187.5	5000
Net take home pay		**20273**	**30800**
		78 €	120 €
Health care - Lump sum		3900	3900
Total social security contributions employer	- Rate	36%	36%
	- Payment	13080	18300
Labor cost		**38580**	**58300**
		148 €	227 €
Tax wedge		47%	47%
Total fiscal payments		**18308**	**27500**
		70 €	107 €
Difference YY			9193

a. Figures are in Hungarian Forints unless otherwise indicated.
b. Figures in € are calculated using the average exchange rate for the corresponding year.

Table 2: Hungary – Main Indicators

	1998	1999	2000	2001	2002
Real GDP growth	4.9	4.2	5.2	4.1	4.4
of which household consumption	4.6	4.8	5	5.7	9.8
Household saving rate (% GDP)	9.5	7	5.7	5.2	2.7
CPI	14.3	10	9.8	9.2	5.3
Gross monthly earnings per full-time employee					
- HUF	67764	77187	87645	103553	122482
- real growth (%)	3.5	5.5	3.4	8.1	12.3
Net monthly earnings per full-time employee					
- HUF	45162	50076	55785	64913	77622
- real growth (%)	3.6	2.5	1.5	6.4	13.6
Activity rate (% pop. aged 15-64)	58.7	59.8	60.1	59.6	59.7
Employment rate (% pop. aged 15-64)	53.7	55.6	56.3	56.2	56.2
Unemployment rate (% labor force 15+)	7.8	7	6.4	5.7	5.8
Youth unemployment rate (% labor force 15-24)	15	12.7	12.5	11.3	12.7
Self-employed (% total employment)	16	15.6	15.1	14.4	13.8
Part-time employment (% total employment)	3.8	3.8	3.5	3.6	3.6
Fixed term contracts (% total employment)	6.5	6.2	7.1	7.5	7.3
Exchange rate (annual average) HUF/EUR	241	253	260	257	243

a. Sources: MNB (Hungarian National Bank), CSO, European Commission.

Table 3: Descriptive Statistics

	ALL				SKILLED				UNSKILLED/SEMI-SKILLED			
	Control		Treatment		Control		Treatment		Control		Treatment	
	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001	2000	2001
N. of HH members	3.2	3.2	3.3	3.3	3.4	3.4	3.4	3.4	3.3	3.3	3.3	3.3
	(1.1)	(1.1)	(1.3)	(1.3)	(1.1)	(1.1)	(1.1)	(1.1)	(1.2)	(1.2)	(1.5)	(1.5)
Y0	94084	110955	82109	104282	95001	112475	83888	108635	91270	106707	77671	97115
	(30487)	(35817)	(32879)	(40362)	(28798)	(34011)	(29993)	(38547)	(29841)	(33689)	(33749)	(40274)
Y1	101109	117907	89398	112812	102504	120005	91649	117738	98679	114380	85234	105852
	(31889)	(36891)	(34859)	(42602)	(29904)	(34927)	(32430)	(40425)	(30784)	(35352)	(35602)	(42756)
Y2	101659	119105	89891	113407	102657	120654	91699	118905	99657	116595	86338	105852
	(32433)	(38521)	(35390)	(44492)	(30029)	(35533)	(32513)	(44114)	(32105)	(39072)	(36852)	(42756)
food	23326	28597	21095	25289	23171	29535	21724	25446	22776	27202	20488	24789
	(10630)	(13067)	(9730)	(11371)	(10219)	(12784)	(8880)	(10913)	(10681)	(12101)	(10757)	(11978)
C1	86125	102121	79662	97919	86760	105398	84816	102162	80226	93941	72569	89594
	(33102)	(38612)	(30956)	(37298)	(31433)	(36903)	(31870)	(37862)	(28772)	(31524)	(27268)	(33823)
C2	88600	105212	81492	100575	88676	108305	86593	105164	82200	96992	74612	91996
	(34503)	(39489)	(31479)	(38789)	(31849)	(37783)	(32715)	(39744)	(29082)	(32145)	(27587)	(35004)
N. of HH	593		196		246		100		234		83	

a. Mean, standard deviation in parenthesis

b. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $w_{2000} \leq w_{2000} \leq 2 * w_{2001}$.

c. See Appendix for definitions. Y0: regular income, Y1: regular income + home production, Y2: Y1+irregular payments. food: food consumption (excluding own production), C1: consumption of nondurable goods, C2: C1+transfers.

Table 4: Baseline

	2000-2001					
Treatment	**-1311****	**-1596****	**-1339****	**-2028*****	**-2362*****	**-2172*****
	(619)	(627)	(635)	(719)	(726)	(771)
ΔHH Income		0.06***	0.06***		0.06***	0.06***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 2000			0.03***			0.02
			(0.01)			(0.02)
Observations				789		
Treated HH				196		
	1999-2000					
Treatment	**-849**	**-579**	**-482**	**-55**	**273**	**389**
	(630)	(600)	(606)	(675)	(645)	(666)
ΔHH Income		0.09***	0.09***		0.09***	0.09***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 1999			0.01			0.01
			(0.01)			(0.02)
Observations				838		
Treated HH				196		
	2000-2001: Mid-Income Sample					
Treatment	**-578**	**-914**	**-669**	**-2331*****	**-2795*****	**-2518*****
	(687)	(693)	(700)	(894)	(894)	(943)
ΔHH Income		0.08***	0.09***		0.09***	0.10***
		(0.02)	(0.02)		(0.03)	(0.03)
HH Income 2000			0.05***			0.04
			(0.02)			(0.03)
Observations				625		
Treated HH				148		
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 5: Baseline – Skilled Workers

			2000-2001			
Treatment	**-3284*** **	**-3858*** **	**-3437*** **	**-2792** **	**-3382*** **	**-2881** **
	(1104)	(1094)	(1131)	(1252)	(1214)	(1309)
ΔHH Income		0.10***	0.10***		0.09***	0.10***
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.05**			0.04
			(0.02)			(0.03)
Observations			346			
Treated HH			100			
			1999-2000			
Treatment	**-345**	**191**	**75**	**750**	**1525**	**1450**
	(898)	(903)	(900)	(1081)	(1094)	(1080)
ΔHH Income		0.09***	0.09***		0.11***	0.11***
		(0.03)	(0.03)		(0.03)	(0.02)
HH Income 1999			-0.01			-0.01
			(0.02)			(0.03)
Observations			375			
Treated HH			88			
			2000-2001: Mid-Income Sample			
Treatment	**-2711** **	**-3248*** **	**-2903** **	**-4140*** **	**-4663*** **	**-4112*** **
	(1221)	(1196)	(1227)	(1427)	(1401)	(1480)
ΔHH Income		0.13***	0.14***		0.14***	0.16***
		(0.03)	(0.03)		(0.04)	(0.04)
HH Income 2000			0.06*			0.06
			(0.03)			(0.04)
Observations			285			
Treated HH			81			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as skilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as skilled worker.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 6: Baseline – Unskilled and Semi-skilled Workers

	2000-2001					
Treatment	**-521.44**	**-575.06**	**-460.64**	**194.61**	**262.79**	**396.21**
	(878)	(878)	(872)	(1170)	(1195)	(1229)
ΔHH Income		0.01	0.01		-0.01	-0.01
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.01			0.01
			(0.02)			(0.02)
Observations			317			
Treated HH			83			
	1999-2000					
Treatment	**-557**	**-278**	**-2**	**888**	**1140**	**1515**
	(922)	(915)	(924)	(952)	(962)	(998)
ΔHH Income		0.06*	0.06*		0.05	0.06
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 1999			0.03*			0.04
			(0.02)			(0.03)
Observations			312			
Treated HH			82			
	2000-2001: Mid-Income Sample					
Treatment	**530.55**	**333.9**	**420.73**	**1771.92**	**1607.51**	**2002.69**
	(979)	(980)	(982)	(1471)	(1506)	(1534)
ΔHH Income		0.04	0.05		0.02	0.04
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 2000			0.03			0.04
			(0.03)			(0.03)
Observations			259			
Treated HH			61			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as unskilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as unskilled worker.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 7: Log Specification

	2000-2001					
Treatment	**-0.02**	**-0.03**	**-0.03**	**-0.05**	**-0.06****	**-0.07****
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔlnHH Income		0.16**	0.14*		0.17**	0.16*
		(0.07)	(0.08)		(0.08)	(0.09)
lnHH Income 2000			-0.02			-0.02
			(0.04)			(0.07)
Observations			789			
Treated HH			196			
	1999-2000					
Treatment	**-0.02**	**-0.01**	**0.00**	**0.00**	**0.02**	**0.03**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
ΔlnHH Income		0.34***	0.36***		0.35***	0.38***
		(0.07)	(0.08)		(0.07)	(0.08)
lnHH Income 1999			0.05			0.08
			(0.04)			(0.06)
Observations			838			
Treated HH			196			
	2000-2001: Mid-Income Sample					
Treatment	**-0.01**	**-0.02**	**-0.02**	**-0.07****	**-0.10*****	**-0.09****
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
ΔlnHH Income		0.28***	0.32***		0.35***	0.42***
		(0.10)	(0.10)		(0.10)	(0.12)
lnHH Income 2000			0.08			0.12
			(0.06)			(0.09)
Observations			625			
Treated HH			148			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 8: Log Specification – Skilled Workers

	2000-2001					
Treatment	**-0.11****	**-0.14*****	**-0.13*****	**-0.10****	**-0.13*****	**-0.13*****
	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.37***	0.43***		0.31***	0.34***
		(0.09)	(0.10)		(0.10)	(0.12)
lnHH Income 2000			0.10			0.06
			(0.07)			(0.09)
Observations			346			
Treated HH			100			
	1999-2000					
Treatment	**-0.04**	**-0.02**	**-0.02**	**0.00**	**0.02**	**0.03**
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.45***	0.44***		0.42***	0.42***
		(0.12)	(0.13)		(0.12)	(0.12)
lnHH Income 1999			-0.03			0.01
			(0.06)			(0.10)
Observations			375			
Treated HH			88			
	2000-2001: Mid-Income Sample					
Treatment	**-0.11****	**-0.13*****	**-0.12****	**-0.17*****	**-0.20*****	**-0.19*****
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.55***	0.62***		0.59***	0.65***
		(0.15)	(0.16)		(0.14)	(0.18)
lnHH Income 2000			0.14			0.11
			(0.10)			(0.13)
Observations			285			
Treated HH			81			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as skilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as skilled worker.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 9: Log Specification – Unskilled and Semi-skilled Workers

			2000-2001			
Treatment	**0.02**	**0.02**	**0.01**	**0.06**	**0.06**	**0.05**
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.02	-0.04		-0.05	-0.08
		(0.11)	(0.11)		(0.11)	(0.11)
lnHH Income 2000			-0.11*			-0.05
			(0.06)			(0.09)
Observations			317			
Treated HH			83			
			1999-2000			
Treatment	**0.01**	**0.01**	**0.03**	**0.07**	**0.08**	**0.09***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.10465383	0.1513664		0.10193319	0.15246842
		(0.12)	(0.12)		(0.12)	(0.13)
lnHH Income 1999			0.10*			0.12
			(0.06)			(0.09)
Observations			312			
Treated HH			82			
			2000-2001: Mid-Income Sample			
Treatment	**0.04**	**0.03**	**0.03**	**0.08**	**0.06**	**0.07**
	(0.04)	(0.04)	(0.04)	(0.07)	(0.07)	(0.07)
ΔlnHH Income		0.25*	0.25*		0.22	0.28*
		(0.14)	(0.14)		(0.14)	(0.16)
lnHH Income 2000			0.00			0.10
			(0.09)			(0.12)
Observations			259			
Treated HH			61			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.
b. OLS estimation. Robust standard errors in parenthesis.
c. *** [**] (*) denote significance at 1, [5], and (10) percent level.
d. Treatment: N. of HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as unskilled workers.
e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as unskilled worker.
For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.
f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 10: Dummy Specification

	2000-2001					
Treatment	**-1509****	**-1772****	**-1378***	**-1967****	**-2312*****	**-2082****
	(753)	(763)	(780)	(828)	(837)	(889)
ΔHH Income		0.06***	0.06***		0.05***	0.06***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 2000			0.03**			0.02
			(0.01)			(0.02)
Observations			789			
Treated HH			196			
	1999-2000					
Treatment	**-1098**	**-749**	**-626**	**-369**	**42**	**163**
	(697)	(684)	(692)	(767)	(755)	(781)
ΔHH Income		0.08***	0.09***		0.09***	0.09***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 1999			0.01			0.01
			(0.01)			(0.02)
Observations			838			
Treated HH			196			
	2000-2001: Mid-Income Sample					
Treatment	**-704**	**-996**	**-605**	**-2056****	**-2471****	**-2133****
	(851)	(857)	(869)	(1017)	(1015)	(1071)
ΔHH Income		0.07***	0.09***		0.09***	0.10***
		(0.02)	(0.02)		(0.03)	(0.03)
HH Income 2000			0.05***			0.04
			(0.02)			(0.03)
Observations			625			
Treated HH			148			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 11: Dummy Specification – Skilled Workers

	2000-2001					
Treatment	**-3458*** **	**-3960*** **	**-3423*** **	**-2514***	**-3135*** **	**-2536***
	(1224)	(1229)	(1272)	(1323)	(1316)	(1418)
ΔHH Income		0.10***	0.10***		0.09***	0.10***
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.05**			0.04
			(0.02)			(0.03)
Observations			346			
Treated HH			100			
	1999-2000					
Treatment	**-271**	**311**	**168**	**928**	**1789**	**1716**
	(1032)	(1031)	(1037)	(1243)	(1245)	(1221)
ΔHH Income		0.10***	0.09***		0.11***	0.11***
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 1999			-0.01			-0.01
			(0.02)			(0.03)
Observations			375			
Treated HH			88			
	2000-2001: Mid-Income Sample					
Treatment	**-2903** **	**-3292** **	**-2862** **	**-3893** **	**-4368*** **	**-3757** **
	(1349)	(1341)	(1375)	(1511)	(1508)	(1586)
ΔHH Income		0.13***	0.14***		0.14***	0.16***
		(0.03)	(0.03)		(0.04)	(0.04)
HH Income 2000			0.06*			0.06
			(0.03)			(0.04)
Observations			285			
Treated HH			81			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as skilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as skilled worker.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 12: Dummy Specification – Unskilled and Semi-skilled Workers

	2000-2001					
Treatment	**-769.08**	**-823.24**	**-639.19**	**237.62**	**318.31**	**489.12**
	(1017)	(1017)	(1020)	(1349)	(1386)	(1450)
ΔHH Income		0.01	0.01		-0.01	-0.01
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.01			0.01
			(0.02)			(0.02)
Observations			317			
Treated HH			83			
	1999-2000					
Treatment	**-959**	**-658**	**-335**	**465**	**693**	**1075**
	(1005)	(1006)	(1036)	(1026)	(1034)	(1071)
ΔHH Income		0.06*	0.06*		0.05	0.06
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 1999			0.03			0.04
			(0.02)			(0.03)
Observations			312			
Treated HH			82			
	2000-2001: Mid-Income Sample					
Treatment	**219.88**	**17.71**	**210.17**	**1787.08**	**1606.43**	**2120.72**
	(1111)	(1114)	(1134)	(1663)	(1698)	(1759)
ΔHH Income		0.04	0.05		0.02	0.04
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 2000			0.03			0.04
			(0.03)			(0.03)
Observations			259			
Treated HH			61			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as unskilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as unskilled worker.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 13: Dummy Treatment – Log Specification

	2000-2001					
Treatment	**-0.01**	**-0.03**	**-0.03**	**-0.04**	**-0.06***	**-0.06***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)
ΔlnHH Income		0.16**	0.14*		0.17**	0.16*
		(0.07)	(0.08)		(0.08)	(0.09)
lnHH Income 2000			-0.02			-0.02
			(0.04)			(0.07)
Observations			789			
Treated HH			196			
	1999-2000					
Treatment	**-0.04**	**-0.03**	**-0.02**	**-0.02**	**0.00**	**0.01**
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
ΔlnHH Income		0.33***	0.36***		0.34***	0.37***
		(0.07)	(0.08)		(0.07)	(0.08)
lnHH Income 1999			0.05			0.07
			(0.04)			(0.06)
Observations			838			
Treated HH			196			
	2000-2001: Mid-Income Sample					
Treatment	**-0.01**	**-0.02**	**-0.02**	**-0.07***	**-0.09****	**-0.08***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
ΔlnHH Income		0.28***	0.32***		0.34***	0.41***
		(0.10)	(0.10)		(0.10)	(0.12)
lnHH Income 2000			0.08			0.13
			(0.06)			(0.09)
Observations			625			
Treated HH			148			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,

with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 14: Dummy Treatment – Log Specification – Skilled Workers

	2000-2001					
Treatment	**-0.12****	**-0.15*****	**-0.14*****	**-0.10****	**-0.13****	**-0.12****
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.36***	0.42***		0.31***	0.34***
		(0.09)	(0.10)		(0.10)	(0.12)
lnHH Income 2000			0.1			0.06
			(0.07)			(0.09)
Observations			346			
Treated HH			100			
	1999-2000					
Treatment	**-0.05**	**-0.02**	**-0.03**	**0.00**	**0.03**	**0.03**
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
ΔlnHH Income		0.45***	0.44***		0.42***	0.42***
		(0.12)	(0.13)		(0.12)	(0.13)
lnHH Income 1999			-0.03			0.01
			(0.06)			(0.10)
Observations			375			
Treated HH			88			
	2000-2001: Mid-Income Sample					
Treatment	**-0.11****	**-0.14****	**-0.13****	**-0.16*****	**-0.19*****	**-0.18*****
	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
ΔlnHH Income		0.54***	0.60***		0.58***	0.65***
		(0.14)	(0.16)		(0.14)	(0.18)
lnHH Income 2000			0.13			0.12
			(0.10)			(0.13)
Observations			285			
Treated HH			81			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as skilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ ***as skiiled workers.***

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 15: Dummy Treatment – Log Specification – Unskilled/Semi-Skilled Workers

	2000-2001					
Treatment	**0.03**	**0.02**	**0.00**	**0.07**	**0.08**	**0.07**
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
ΔlnHH Income		0.02	-0.04		-0.06	-0.08
		(0.11)	(0.11)		(0.11)	(0.11)
lnHH Income 2000			-0.11*			-0.04
			(0.06)			(0.09)
Observations			317			
Treated HH			83			
	1999-2000					
Treatment	**-0.02**	**-0.01**	**0.01**	**0.05**	**0.05**	**0.07**
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)
ΔlnHH Income		0.0990745	0.14377155		0.09363127	0.13828577
		(0.12)	(0.12)		(0.12)	(0.13)
lnHH Income 1999			0.10			0.11
			(0.06)			(0.09)
Observations			312			
Treated HH			82			
	2000-2001: Mid-Income Sample					
Treatment	**0.04**	**0.02**	**0.02**	**0.10**	**0.08**	**0.09**
	(0.05)	(0.05)	(0.05)	(0.07)	(0.08)	(0.08)
ΔlnHH Income		0.25*	0.25*		0.22	0.29*
		(0.14)	(0.14)		(0.14)	(0.16)
lnHH Income 2000			0.00			0.11
			(0.09)			(0.13)
Observations			259			
Treated HH			61			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in log food consumption (excluding own production); monthly.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Treatment: =1 if there are HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as unskilled workers.

e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ ***as unskiiled workers.***

For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 16: Continuous Treatment

			2000-2001			
Treatment	**-0.12***	**-0.14****	**-0.12***	**-0.17****	**-0.20*****	**-0.18****
	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)	(0.08)
ΔHH Income		0.06***	0.06***		0.05**	0.06***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 2000			0.03***			0.02
			(0.01)			(0.02)
Observations				789		
Treated HH				196		
			1999-2000			
Treatment	**-0.01**	**0.02**	**0.03**	**0.08**	**0.13****	**0.14****
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
ΔHH Income		0.09***	0.09***		0.09***	0.10***
		(0.02)	(0.02)		(0.02)	(0.02)
HH Income 1999			0.01			0.02
			(0.01)			(0.02)
Observations				838		
Treated HH				196		
			2000-2001: Mid-Income Sample			
Treatment	**-0.03**	**-0.06**	**-0.04**	**-0.20****	**-0.23*****	**-0.21****
	(0.07)	(0.07)	(0.07)	(0.09)	(0.09)	(0.09)
ΔHH Income		0.07***	0.09***		0.08***	0.10***
		(0.02)	(0.02)		(0.03)	(0.03)
HH Income 2000			0.05***			0.04*
			(0.02)			(0.03)
Observations				625		
Treated HH				148		
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.
b. OLS estimation. Robust standard errors in parenthesis.
c. *** [**] (*) denote significance at 1, [5], and (10) percent level.
d. Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH for members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector.
e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.
For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.
f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 17: Continuous Treatment – Skilled Workers

	2000-2001					
Treatment	**-0.23****	**-0.28*****	**-0.26*****	**-0.27****	**-0.31*****	**-0.28****
	(0.10)	(0.10)	(0.10)	(0.12)	(0.11)	(0.12)
ΔHH Income		0.09***	0.10***		0.09***	0.10***
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.05***			0.05*
			(0.02)			(0.02)
Observations	346					
Treated HH	100					
	1999-2000					
Treatment	**0.05**	**0.08**	**0.07**	**0.09**	**0.13**	**0.12**
	(0.09)	(0.08)	(0.08)	(0.10)	(0.10)	(0.10)
ΔHH Income		0.10***	0.09***		0.11***	0.10***
		(0.02)	(0.02)		(0.03)	(0.02)
HH Income 1999			-0.01			-0.01
			(0.02)			(0.03)
Observations	375					
Treated HH	88					
	2000-2001: Mid-Income Sample					
Treatment	**-0.17**	**-0.22****	**-0.21***	**-0.30****	**-0.34*****	**-0.31****
	(0.11)	(0.11)	(0.11)	(0.13)	(0.13)	(0.13)
ΔHH Income		0.13***	0.14***		0.13***	0.16***
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 2000			0.06**			0.07*
			(0.03)			(0.04)
Observations	285					
Treated HH	81					
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.
b. OLS estimation. Robust standard errors in parenthesis.
c. *** [**] (*) denote significance at 1, [5], and (10) percent level.
d. Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH for members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as skilled workers.
e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as skilled workers.
For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.

Table 18: Continuous Treatment – Unskilled/Semi-Skilled Workers

	2000-2001					
Treatment	**-0.05**	**-0.06**	**-0.04**	**0.00**	**0.00**	**0.02**
	(0.09)	(0.09)	(0.10)	(0.13)	(0.13)	(0.14)
ΔHH Income		0.01	0.01		-0.01	-0.01
		(0.03)	(0.03)		(0.03)	(0.03)
HH Income 2000			0.01			0.01
			(0.02)			(0.02)
Observations			317			
Treated HH			83			
Treatment	**-0.04**	**0.00**	**0.03**	**0.08**	**0.11**	**0.15**
	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)	(0.10)
ΔHH Income		0.06*	0.06*		0.05	0.06
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 1999			0.03*			0.04
			(0.02)			(0.03)
Observations			312			
Treated HH			82			
	2000-2001: Mid-Income Sample					
Treatment	**0.06**	**0.04**	**0.05**	**0.11**	**0.09**	**0.13**
	(0.12)	(0.12)	(0.12)	(0.18)	(0.18)	(0.18)
ΔHH Income		0.04	0.05		0.03	0.04
		(0.04)	(0.04)		(0.04)	(0.04)
HH Income 2000			0.03			0.03
			(0.03)			(0.03)
Observations			259			
Treated HH			61			
Additional controls:						
Month dummies	X	X	X	X	X	X
Employee characteristics				X	X	X
Geographical dummies				X	X	X
Demographic characteristics				X	X	X

a. Dependent variable is change in food consumption (excluding own production); monthly.
b. OLS estimation. Robust standard errors in parenthesis.
c. *** [**] (*) denote significance at 1, [5], and (10) percent level.
d. Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH within HH for members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector as unskilled workers
e. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period,
with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$ as unskilled workers.
For the mid-income sample, the income limits are 50,000-150,000 HUF at 2000 prices.
f. Δ: change; HH: Household; ϖxx: minimum wage in xx; wxx: wage in xx.

Table 19: Consumption-Income Gap – Whole Sample

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-4855**	-4375*	-4833**	-4352*
	(2163)	(2351)	(2205)	(2387)
Full controls	-4816**	-3927	-5189**	-4299
	(2414)	(2660)	(2474)	(2706)
	Dummy Treatment			
Time controls	-4010	-3481	-3955	-3425
	(2533)	(2794)	(2571)	(2821)
Full controls	-3437	-2414	-3774	-2751
	(2773)	(3085)	(2832)	(3125)
	Continuous Treatment			
Time controls	-0.42*	-0.42*	-0.43*	-0.43*
	(0.23)	(0.24)	(0.23)	(0.24)
Full controls	-0.36	-0.36	-0.42*	-0.41
	(0.23)	(0.25)	(0.24)	(0.26)

	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.051**	-0.047**	-0.054**	-0.050**
	(0.022)	(0.023)	(0.022)	(0.023)
Full controls	-0.062**	-0.055**	-0.067***	-0.060**
	(0.026)	(0.027)	(0.026)	(0.026)
	Dummy Treatment			
Time controls	-0.050*	-0.045	-0.052*	-0.048*
	(0.027)	(0.028)	(0.027)	(0.028)
Full controls	-0.057*	-0.048	-0.061**	-0.052*
	(0.031)	(0.031)	(0.030)	(0.031)
Observations	789			
Treated HH	196			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.

Table 20: Consumption-Income Gap – Mid-Income Sample

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-3484	-2191	-3667	-2374
	(2379)	(2549)	(2428)	(2602)
Full controls	-5156*	-2713	-6291**	-3848
	(2660)	(2825)	(2761)	(2937)
	Dummy Treatment			
Time controls	-2292	-707	-2570	-985
	(2664)	(2856)	(2704)	(2901)
Full controls	-3339	-489	-4493	-1643
	(2930)	(3090)	(2973)	(3151)
	Continuous Treatment			
Time controls	-0.22	-0.16	-0.25	-0.19
	(0.25)	(0.26)	(0.26)	(0.27)
Full controls	-0.3	-0.21	-0.41	-0.33
	(0.26)	(0.27)	(0.27)	(0.29)

	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.033	-0.025	-0.039	-0.03
	(0.023)	(0.024)	(0.024)	(0.024)
Full controls	-0.054**	-0.037	-0.065**	-0.049*
	(0.027)	(0.027)	(0.028)	(0.028)
	Dummy Treatment			
Time controls	-0.025	-0.015	-0.031	-0.021
	(0.027)	(0.028)	(0.027)	(0.028)
Full controls	-0.04	-0.021	-0.051*	-0.032
	(0.031)	(0.031)	(0.030)	(0.030)
Observations	625			
Treated HH	148			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.

Table 21: Consumption-Income Gap – Skilled Workers

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-10404***	-10826***	-10457***	-10879***
	(3450)	(3635)	(3471)	(3637)
Full controls	-8593**	-9625**	-8267**	-9300**
	(3824)	(4167)	(3853)	(4171)
	Dummy Treatment			
Time controls	-10471***	-10988***	-10585***	-11102***
	(3843)	(4074)	(3824)	(4035)
Full controls	-8796**	-10145**	-8564**	-9914**
	(4268)	(4630)	(4285)	(4607)
	Continuous Treatment			
Time controls	-0.73**	-0.77**	-0.74**	-0.79**
	(0.35)	(0.37)	(0.35)	(0.37)
Full controls	-0.63*	-0.71*	-0.61*	-0.69*
	(0.36)	(0.40)	(0.37)	(0.40)

	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.114***	-0.114***	-0.114***	-0.115***
	(0.033)	(0.033)	(0.033)	(0.033)
Full controls	-0.101***	-0.105***	-0.098***	-0.102***
	(0.034)	(0.035)	(0.034)	(0.035)
	Dummy Treatment			
Time controls	-0.120***	-0.122***	-0.121***	-0.122***
	(0.036)	(0.037)	(0.036)	(0.037)
Full controls	-0.108***	-0.113***	-0.106***	-0.111***
	(0.038)	(0.039)	(0.038)	(0.039)
Observations	346			
Treated HH	100			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.

Table 22: Consumption-Income Gap – Skilled Workers – Mid-Income Sample

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-6811*	-6438*	-6928*	-6555*
	(3544)	(3550)	(3603)	(3607)
Full controls	-8777**	-8447**	-9063**	-8733**
	(4258)	(4246)	(4323)	(4322)
	Dummy Treatment			
Time controls	-6781*	-6354	-6995*	-6569*
	(3923)	(3928)	(3950)	(3954)
Full controls	-8948**	-8729*	-9338**	-9119**
	(4489)	(4458)	(4542)	(4520)
	Continuous Treatment			
Time controls	-0.4	-0.39	-0.43	-0.42
	(0.33)	(0.34)	(0.34)	(0.34)
Full controls	-0.49	-0.47	-0.55	-0.54
	(0.41)	(0.42)	(0.42)	(0.43)

	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.080**	-0.077**	-0.080**	-0.078**
	(0.034)	(0.034)	(0.034)	(0.034)
Full controls	-0.101**	-0.098**	-0.102**	-0.100**
	(0.040)	(0.040)	(0.040)	(0.040)
	Dummy Treatment			
Time controls	-0.085**	-0.082**	-0.086**	-0.083**
	(0.038)	(0.038)	(0.038)	(0.038)
Full controls	-0.106**	-0.104**	-0.107**	-0.106**
	(0.043)	(0.043)	(0.043)	(0.043)
Observations	285			
Treated HH	81			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.

Table 23: Consumption-Income Gap – Unskilled/Semi-Skilled Workers

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-2424	-93	-3025	-693
	(3587)	(4234)	(3544)	(4220)
Full controls	791	3863	801	3872
	(4215)	(4569)	(4261)	(4626)
	Dummy Treatment			
Time controls	-1567	1235	-2535	267
	(3952)	(4690)	(4049)	(4792)
Full controls	1217	5092	1165	5040
	(4922)	(5327)	(4959)	(5385)
	Continuous Treatment			
Time controls	-0.51	-0.4	-0.58*	-0.47
	(0.34)	(0.39)	(0.34)	(0.39)
Full controls	-0.29	-0.24	-0.31	-0.25
	(0.41)	(0.43)	(0.42)	(0.44)

	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.035	-0.02	-0.043	-0.028
	(0.039)	(0.041)	(0.037)	(0.039)
Full controls	-0.011	0.008	-0.015	0.004
	(0.050)	(0.049)	(0.048)	(0.047)
	Dummy Treatment			
Time controls	-0.035	-0.017	-0.048	-0.03
	(0.045)	(0.047)	(0.044)	(0.046)
Full controls	-0.016	0.008	-0.022	0.001
	(0.058)	(0.057)	(0.056)	(0.055)
Observations	317			
Treated HH	83			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.

Table 24: Consumption-Income Gap – Unskilled/Semi-Skilled Workers – Mid-Income Sample

	C1-Y1	C1-Y2	C2-Y1	C2-Y2
	Baseline Treatment			
Time controls	-3420	440	-4635	-775
	(4257)	(5550)	(4069)	(5439)
Full controls	3612	10335*	3048	9772
	(4951)	(6248)	(4957)	(6289)
	Dummy Treatment			
Time controls	-2437	1944	-4275	106
	(4259)	(5687)	(4300)	(5756)
Full controls	4067	11898*	3308	11138
	(5595)	(7008)	(5619)	(7070)
	Continuous Treatment			
Time controls	-0.50	-0.28	-0.57	-0.36
	(0.46)	(0.57)	(0.46)	(0.58)
Full controls	0.2	0.31	0.18	0.29
	(0.49)	(0.62)	(0.52)	(0.64)
	lnC1-lnY1	lnC1-lnY2	lnC2-lnY1	lnC2-lnY2
	Baseline Treatment			
Time controls	-0.032	-0.007	-0.048	-0.023
	(0.043)	(0.048)	(0.041)	(0.046)
Full controls	0.029	0.072	0.015	0.058
	(0.053)	(0.055)	(0.052)	(0.054)
	Dummy Treatment			
Time controls	-0.026	0.002	-0.05	-0.022
	(0.045)	(0.050)	(0.045)	(0.050)
Full controls	0.029	0.078	0.01	0.06
	(0.060)	(0.062)	(0.058)	(0.061)
Observations	259			
Treated HH	61			

a. C1: consumption of nondurable goods, C2: C1+transfers, Y1: regular income + home production, Y2: Y1+irregular payments. See Appendix for details.

b. OLS estimation. Robust standard errors in parenthesis.

c. *** [**] (*) denote significance at 1, [5], and (10) percent level.

d. Baseline Treatment (Dummy Treatment): N. of (=1 if there are) HH members employed for the whole period s.t. $\varpi_{2000} \leq w_{2000} \leq \varpi_{2001}$ in the private sector. Continuous Treatment: $\sum (w_{2000} - \varpi_{2000})$ within HH.

e. Time controls include month dummies. Full controls adds Employee characteristics, Geographical dummies, Demographic characteristics. See Appendix for details.

f. Sample: HH with constant family structure and positive income below 200,000 HUF at 2000 prices for the whole period, with at least one member employed for the whole period, s.t. $\varpi_{2000} \leq w_{2000} \leq 2*\varpi_{2001}$.

g. Δ: change; HH: Household; ϖ_{xx}: minimum wage in xx; w_{xx}: wage in xx.