INSIDERS, OUTSIDERS, AND THE UNDERGROUND ECONOMY

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Abstract

This paper considers whether labour market rigidities lead to more underground economic activities. This is suggested by aggregate cross-country data which show that underground economic activities are more strongly correlated with a commonly used index of employment protection than with effective tax rates. A simple theoretical model is constructed to support this finding. The model, contrary to many models of equilibrium unemployment in the literature, also has the feature that a rise in a proportional tax affects employment (in addition to underground economic activities). Finally affect employment, incentives, and underground economic activities.

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I Introduction

In the popular debate labour taxes are often blamed for two things: destroying employment opportunities and encouraging tax dodging. Both questions have been examined empirically. The empirical literature linking employment to taxes have produced rather mixed results, with some contributions finding a negative relation, and others finding no such relation.[1] The same literature, however, generally places more emphasis on other labour market institutions, not least the unemployment benefit regime and labour market rigidities.[2]

Looking at the relationship between taxation and the shadow economy, Schneider (2000) reports a positive correlation between a calculated measure of overall tax and social security contributions and underground economic activity as percent of GDP for 18 OECD countries.[3] However, some authors have stressed that other institutional factors such as corruption, bureaucracy, weak legal systems and regulation tend to drive entrepreneurs underground. E.g. Friedman et al. (2000) investigating 69 countries, including transition countries and developing countries, find no significant effect of taxes, but a significant effect of various measures of the business environment reflecting corruption and the legal environment.[4] Thus it would appear that institutional factors other than taxes appear to play an important role in determining the size of the underground economy.

In order to understand what these factors may be it is useful to consider the identities of those individuals who supply labour to the underground economy. In a particularly illuminating study using a specialized data set from Quebec, Lemieux et al. (1994) find, among other things, that the supply of labour to the underground economy comes to a large extent from individuals with relatively weak attachment to the regular labour market, such as unemployed, students, and low-skilled workers.

This pattern raises the question of whether there may be a link between labour market institutions and the level of underground economic activity. Suppose e.g. that various forms

[1] See e.g. Gruber (1997), Nickell (1998), Layard, Jackman and Nickell (1999), Madsen (1998) and Daveri and Tabellini (2000).

[2] See e.g. Nickell (1997).

[3] See Andreoni et al. (1998) for a survey of theory and empirical evidence and Schneider and Enste (2000) for estimates of the shadow economy in large set countries, and for a discussion of various causes, including taxation, regulation and corruption.

[4] See also Johnson, Kaufman and Zoido-Lobaton (1998)

of labour market rigidities reinforce the dichotomy between "insiders" and "outsiders"; by worsening the job prospects for outsiders such rigidities may then affect their incentives to seek alternative sources of income on the fringe of the economy.

The question is thus if there is any indication that rigid labour markets are associated with widespread underground economic activities. Consider Table 1 which shows, for 15 OECD countries, the partial correlation between underground economic activity with a commonly used index of employment protection on the one hand and overall tax wedge. The table highlights a surprisingly strong relationship between underground economic activity and OECD's measure of employment protection (OECD, 1999). Indeed, underground economic activity is even more strongly related to employment protection than to taxes.

Shadow Economy/GDP	Partial Correlation	Significance
Employment Protection	0.486	0.078
Overall Tax Wedge	0.136	0.642

Table 1: Partial Correlation between underground economic activity in 1995 for 16 OECD countries with OECD index of employment protection and with overall tax wedge. For data and sources, see Table 4 in the Appendix.

Why more exactly might underground economic activity be related to labour market rigidities in general and employment protection in particular? One simple intuition is that labour market rigidities tend to worsen the employment prospects for current "outsiders" by slowing down the flows in the labour market, making it more difficult to make it into a regular job. In order to explore this intuition this paper builds a small model of underground trade, regular employment, taxation and employment protection. The model focuses on the supply of labour to the underground economy by unemployed, and shows how employment protection and taxes may increase underground economic activity.[5]

The main effect of employment protection is to reduce the rate of transition in and out of regular employment. This means that the number of jobs that are created (per unit of time) is reduced. In so far as this also reduces equilibrium employment, it directly increases underground

[5]Anderberg, Balestrino and Galmarini (2003) examine a model (without unemployment) with heterogeneity in terms of earnings capacity. They show that workers with relatively low earnings capacity are more likely to be engaged in underground activities; they also endogenize tax policy and enforcement policy by modelling a political process and show that more high taxes need not be associated with more underground economic activities since they are likely to be combined with more tax enforcement.

activities. However, more importantly, the slower rate of job creation also reduces the average job-finding rate among current outsiders and thus increases their incentives to participate in irregular activities at the expense of regular job search. Taxation interacts with this process; on the one hand it directly encourages trading in the (untaxed) underground economy. This increased relative attractiveness of trading in the underground economy in turn affects job creation through the wage setting process.

The model thus also provides a theoretical foundation for an endogenous negative relation between taxes and employment. This is interesting since most standard models predict that, conditional on unemployment benefits being a fixed proportion of net earnings, labour taxes are neutral with respect to unemployment. This results (which holds both in standard matching-models and efficiency wage models) is intuitive: given the structure of unemployment benefit, taxation doesn't affect the relative attractiveness of being in and out of work. This property does not hold in the current model, however, since workers who out unemployed can engage in underground economic activities, which becomes relatively more attractive at high levels of taxation.[6]

The paper is organized as follows. Section II sets up the model. Section III characterizes the equilibrium and derives the main analytical results. Section IV presents some simple simulations of the model which illustrate the interaction between taxes and employment protection. Section V concludes.

II The Model

Consider an economy with a continuum (of unit size) of identical workers. Time is continuous and each worker can be either employed or unemployed. There is a single numeraire consumption good. Employed workers work full time in regular employment. Unemployed workers divide their time to two activities: search for a regular job and underground economic activity. There is a single numeraire good and the workers maximize expected discounted lifetime income. The government taxes regular incomes at the rate θ and pays out unemployment benefits b to unemployed workers. The benefit is a fixed fraction of the average net wage during a typical employment relation, $b = \beta(1-\theta)\overline{w}$, where $\beta \in [0,1)$ is the replacement ratio.

[6] A similar argument has recently been made by Holmlund (2001) who, rather than looking at underground economic activity, assumes that unemployed workers can engage in household production. Holmlund however does not consider employment protection.

Underground Activities

A simple way of thinking about the underground economy is as a "backyard" activity; every worker is assumed to have available a simple constant returns to scale technology: one hour devoted to production generates one unit of output. We model diversity of goods implicitly by assuming that no worker consumes his own output. Instead, unemployed workers swap goods with each other at S exogenously given "trading spots".[7] In order to trade at one of these trading spots a worker must bring his output; however, he can only bring one unit at a time. Hence, in order to trade ξ_i units agent i must make ξ_i visits.[8] The time it takes to travel to a trading spot is $m > 0$. (Trading on the other hand is instantaneous). Thus, an unemployed agent who wishes to swap ξ_i units of goods must devote $(1+m)\,\xi_i$ to the underground activity, ξ_i hours to production and $m\xi_i$ hours to travelling.

The parameter m can be viewed as capturing tax enforcement; suppose that the tax authorities randomly inspect a fraction of the S trading places. A worker who arrives at a place that is currently being inspected cannot trade there, but must travel elsewhere. Thus, the more frequent are inspections, the larger is the average travelling cost per unit traded. Thus attempts to crack down on the underground economy can be represented in the model with a larger value of m.

The alternative use of time is in search for regular employment. Let this search effort be denoted σ_i, and let total hours per period be normalized to 1. The time constraint per period facing agent i when unemployed is therefore $\sigma_i + (1+m)\,\xi_i = 1$.

Search for Regular Employment

The unemployed workers search for the regular jobs that are being created (see below). We model this competition among the unemployed as a simple version of the game of "musical chairs". By searching more (less) than the other unemployed workers, an agent obtain a higher

[7] An equivalent alternative to characterizing the underground economy as a "backyard activity" is to assume that an officially unemployed worker can take a number of unofficial short-run part-time jobs (each part-time job lasting exactly one period). In that case ξ_i can be the time the worker spends searching for unofficial jobs and m is the number of odd jobs located. In each case we assume that the worker obtains the entire surplus from the underground activity; this simplifying assumption allows us to ignore the identity of underground buyers (alt. employers).

[8] Note that trade need not be bilateral; hence it is no problem even if an odd number of workers arrive at the same time; as long as at least two persons arrive at the same time everyone can trade instantaneously.

(lower) than average hiring probability. Let α denote the baseline job-finding hazard, the job finding rate of a worker who searchers as hard as the average unemployed worker. (The determination of α is outlined below.) Then let f be a continuously differentiable "contest-function" f with the following properties: $f(0)=0$, $f(1)=1$, $f'(\cdot)>0$, and $f''(\cdot)<0$. Let $\overline{\sigma}$ denote the average search intensity among the unemployed. We will then assume that the job-finding rate of agent i is $\alpha f(\sigma_i/\overline{\sigma})$, which is clearly increasing and concave in σ_i. Since we will focus on symmetric equilibria, $f'(1)$ will be of particular interest; given the above assumptions, $f'(1)$ is a real number in the interval $(0,1)$. Thus let γ denote this value.

The Behaviour of Unemployed Workers

Consider the behaviour of a typical unemployed worker. Let U denote the value, i.e. the expected discounted future consumption, to an unemployed worker, and let $V(0)$ be the value of being newly employed (where the 0 indicates that that the duration of the employment is zero). Since the worker behaves optimally, taking $\overline{\sigma}$ as given, U must satisfy the asset equation

$$rU=\max_{\xi_i,\sigma_i}\left\{\xi_i+b+\alpha f\left(\frac{\sigma_i}{\overline{\sigma}}\right)(V(0)-U)\,|1=\sigma_i+(1+m)\,\xi_i\right\}, \tag{1}$$

where r is the interest rate. The first order conditions for an interior solution imply that

$$\frac{1}{(1+m)}=\alpha f'\left(\frac{\sigma_i}{\overline{\sigma}}\right)\frac{(V(0)-U)}{\overline{\sigma}}. \tag{2}$$

We will be looking for a symmetric steady state equilibrium, $\sigma_i=\overline{\sigma}$ for all i. Equation (2) then yields the following equilibrium condition (dropping the subscript i)

$$\xi+\alpha\gamma(V(0)-U)=\frac{1}{(1+m)}, \tag{3}$$

where we used that $\sigma=1-(1+m)\,\xi$ and $f'(1)=\gamma$.

The Regular Sector

The model captures two important aspects of employment protection. On the one hand it generates job-security to the currently employed workers. On the other hand it also reduces the employers' flexibility; this is captured by the fact the employment protection does not allow the firm to fire a worker even though the productivity of the match is deteriorating (see below). This latter effect makes it less attractive for entrepreneurs to create regular jobs.

While underground trade is the outcome of short-run connections, regular jobs have longer duration. The quality of a job-match between a worker and an employer deteriorates deterministically over time. However, employment protection prohibits an employer from firing a worker until after a certain duration T.[9] An early closure will be penalized with a fine which we assume is so large that early closure is never optimal for an employer. Jobs are created at the highest possible productivity of one unit of output per hour.[10]

The output of a match $y(t)$ deteriorates exponentially with the duration of the employment, $y(t) = e^{-\delta t}$ where $\delta > 0$. Let $J(t)$ denote the discounted future profits of a employment with current duration t,

$$J(t) = \int_t^T (y(\tau) - w(\tau)) e^{-r(\tau - t)} d\tau. \tag{4}$$

Free entry implies a zero-profit condition: discounted profits at entry is zero, $J(0) = 0$. Once in an employment relationship there is a surplus to be shared by the worker and the employer. The wage given to the worker to reflect output and the worker's outside option. Let $S(t)$ denote the discounted future output of a employment with current duration t. Following Saint-Paul (2002) we assume that wage bargaining generates a gain to the worker that is a fraction of the net of tax discounted output[11]

$$V(t) - U = \phi(1 - \theta) S(t) \tag{5}$$

where $\phi \in (0, 1)$ represents the bargaining strength of the worker and where $V(t)$ is the discounted future consumption for a worker who is in a job with current duration t. The value $V(t)$ satisfies the asset equation,

$$rV(t) = (1 - \theta) w(t) + V'(t), \tag{6}$$

with boundary condition $V(T) = U$.

Wage Determination

The wage paid to the worker declines over the employment.[12] To derive the equilibrium wage we can eliminate the values from the asset equations; first we eliminate V from (6) using (5),

[9] Our modelling of employment protection is deliberately kept to a minimum. For more detailed theoretical analysis of employment protection see Pissarides (2001), Saint-Paul (2002), and Blanchard (2003).

[10] The assumption that the underground technology is "state-of-the-art" is made simply to save notation.

[11] See Saint-Paul (2002) for a microfoundation for this formulation.

[12] A more realistic model would assume exogenous technological growth, in which case the wage paid could be constant or even increasing with tenure.

and using the fact that $S'(t) - rS(t) = -y(t)$. The value U can then be eliminated from the resulting equation by using (1) evaluated at the equilibrium. Doing so yields the equilibrium wage equation

$$w(t) = \phi y(t) + \beta\overline{w} + (1-\theta)^{-1}\xi + \alpha\phi S(0), \tag{7}$$

where $\overline{w}$ is the average wage (in the population, or equivalently, or an employment spell). Note that the wage decreases more slowly than output. Hence flow profits are positive at the beginning of the employment and negative towards the end. Integrating (7) over t yields the following expression for the average wage,

$$\beta\overline{w} = \frac{\beta}{(1-\beta)}\left(\frac{\phi}{T}\int_0^T y(t)\,dt + (1-\theta)^{-1}\xi + \alpha\phi S(0)\right). \tag{8}$$

III Equilibrium

There are two endogenous variables, the job-finding rate α and the time-allocation ξ, determined by free-entry and optimal search/underground activity. Thus consider the free entry condition $J(0) = 0$. Using (7) to replace $w(t)$ in (4), evaluating at $t = 0$, and using (8) to eliminate $\beta\overline{w}$ this condition can be written as

$$(1-\theta)^{-1}\xi + \alpha\phi S_0(T) = \Lambda(T,\beta), \tag{FE}$$

where

$$\Lambda(T,\beta) \equiv (1-\beta)\left(\frac{1-e^{-rT}}{r}\right)^{-1}(1-\phi)S_0(T) - \beta\frac{\phi}{T}\left(\frac{1-e^{-\delta T}}{\delta}\right), \tag{9}$$

and where the notation $S_0(T) \equiv S(0)$ is used to emphasize the dependence of the discounted output of an employment on T. The second equilibrium condition is the optimal time allocation (3) which, using (5), can be written as

$$\xi + \alpha\gamma(1-\theta)\phi S_0(T) = \frac{1}{(1+m)}. \tag{TA}$$

When depicted in (α,ξ)-space, the free-entry condition (FE) is linear with slope

$$\left.\frac{d\xi}{d\alpha}\right|_{FE} = -\phi S_0(T)(1-\theta) < 0.$$

The negative slope indicates that more underground activity induces less job-creation. Similarly, when depicted in (α,ξ)-space, the time allocation condition (TA) is linear with slope

$$\left.\frac{d\xi}{d\alpha}\right|_{TA} = -\gamma\phi S_0(T)(1-\theta) < 0.$$

This says that, the lower is the average job-finding rate α, the more the unemployed workers will engage in underground activities. Note that the slope of (TA) is γ times the slope of (FE); hence (TA) is less steep than (FE). The fact that α and ξ are negatively related in both conditions suggests that there could potentially be multiple equilibria; this is however ruled out by the fact that both equilibrium conditions are linear. Even though there will not be any multiple equilibria, the strategic complementarity between α and ξ is likely to give rise to large comparative static effects (snowball effects): a change in a policy parameter that e.g. strengthens the incentives for underground activity indirectly reduces the incentives for the creation of regular jobs, which further strengthens the incentives for underground activity etc.

PROPOSITION 1 *If a symmetric steady state equilibrium exists, it is unique and satisfies (FE) and (TA).*

FIG 1 HERE

Comparative Statics

The parameters of interest to perform comparative statics on are the tax rate θ, the replacement ratio β, and employment protection T. We will restrict our attention to the limiting case where $r \to 0$; doing so simplifies the expression for $\Lambda(T, \beta)$ considerably; in the limit

$$\Lambda(T, \beta) = \frac{S_0(T)}{T}(1 - \phi - \beta), \tag{10}$$

with $S_0(T) \equiv \left(1 - e^{-\delta T}\right)/T$.[13]

Consider then the impact of the replacement ratio β. β only affect the free entry condition; in terms of Figure 1 an increase in β simply shifts (FE) downwards, thus reducing job-creation for any given ξ. The equilibrium effect is thus to increase ξ and decrease α; indeed, it is easy to see that the effect on ξ is particularly strong when γ is large (close to unity). Since β decreases α (with T being constant) it also increase the equilibrium unemployment rate: note that the steady state unemployment rate is simply equal to $1/(1 + \alpha T)$.

Turning to the tax rate θ, we should recall that unemployment is neutral w.r.t. taxation in most equilibrium models of unemployment (and indeed would be so in the current model if

[13] We assume that $\phi + \beta < 1$ in order to ensure some job-creation.

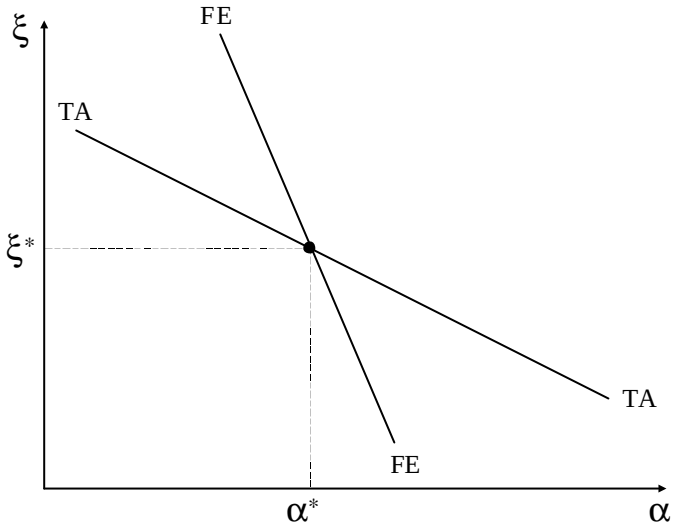

Figure 1: The symmetric steady state equilibrium.

there was no option of underground economic activity).[14] In contrast to β, θ affects both the free entry and the time allocation condition. Simple comparative statics on (FE) and (TA) show that α (and thus equilibrium employment) decreases in θ while ξ increases in θ. Intuitively, since underground trading is untaxed, taxation increases the attractiveness of this activity relative to search for regular employment. The direct effect of θ on incentives for underground trading is then compounded by a negative effect on job-creation. Since increased taxation increases both the number of unemployed and also the amount of underground trading for each unemployed individual, it obviously also increases the shadow economy's share of GDP.

Turning to the effect of T on ξ, it is important to recognize that there are likely to be effects going in opposite directions. One the one hand, an increase in T makes regular jobs more attractive by making them last longer. This effect boosts search incentives. On the other hand, an increase in T constrains employers' choices further, and will hence reduce the incentives for job creation. Thus while the value of each "prize" in the job-searching contest increases, the number of prizes to be won decreases. The question is which effect will dominate. From (TA) we can see that T's effect on ξ and on $\alpha S_0(T)$ will have opposite signs; this makes sense since α is the baseline-job finding rate and $S_0(T)$ is proportional to the gain in value from finding a job. Eliminating ξ between (FE) and (TA) reveals that the effect of T on $\alpha S_0(T)$ has the same sign as $\partial\Lambda/\partial T$. Hence we can differentiate (10) which yields,

$$\frac{\partial \Lambda}{\partial T} = \frac{\left[(1+\delta T)\, e^{-\delta T} - 1\right]}{\delta T^2} (1 - \phi - \beta) < 0.$$

where the sign follows from the fact that $(1+z)\, e^{-z} \in (0,1)$ for all $z > 0$. Thus we can conclude that an increase in T, just like an increase in taxation or the replacement ratio, increases ξ and decreases α. Hence while increasing T makes regular jobs more attractive by making them last longer, it decreases the number of job created even faster, leading to the overall conclusion that an increase in T erodes the incentives for job search and, conversely, increases the incentives for trading in the underground economy.[15]

PROPOSITION 2 *Comparative statics on the symmetric steady state equilibrium. An increase*

[14] To see this let $\xi = 0$; the only endogenous variable is then α which must satisfy the free entry condition $\alpha\phi S_0(T) = \Lambda(T, \beta)$. Thus while employment protection T and generous benefits β is still detrimental to employment, θ has no effect on employment.

[15] Employment protection typically has an ambiguous effect on employment; however, in the current model it can easily be shown that employment protection also reduces equilibrium employment. The steps are similar to those showing the impact on $\alpha S_0(T)$.

in either (i) the replacement ratio β, (ii) the labour income tax rate θ, or, (iii) employment protection T, increases amount of underground trading ξ and reduces the equilibrium job finding rate α.

By solving the equilibrium equations it can also easily be shown that $\partial^2\xi/\partial\theta\partial T > 0$; intuitively, smaller flows in the labour market makes the underground activities more responsive to taxation.

IV A Numerical Example

The purpose of this short section is to numerically illustrate the model in order to highlight how two very different policy regimes can generate similar behaviour. The parameters in the model are set as follows. The time period is taken to be the month. The replacement ratio β is set to 0.35 which is reasonable in an OECD context, taking into account benefit expiration and the non-eligibility. The technology-deterioration rate δ is varied between 0.002 and 0.004.[16] The workers are assumed to capture three percent of the value of output, $\phi = 0.03$. Finally, the curvature γ and the cost of trading in the shadow economy m are set so as to obtain reasonable values for the monthly exit rate from unemployment at high taxes/low employment protection and vice versa; this leads us to choose $\gamma = 0.35$ and $m = 5$.[17]

Since the main mechanism stressed in the model is that of small flows on the incentives to participate in underground economic activity, we choose values of T that are correspond to observed average completed job tenures. Average completed job tenure varies substantially across the OECD countries. Looking at Table 4 (in the Appendix) we can spot some patterns. Shortest average tenure is in the U.S. and the U.K.; after these countries come the Nordic countries, followed by countries in continental Europe, with the South-European countries exhibiting the longest average completed tenures. Based on these observed completed tenures, we choose to vary T from four years to sixteen years; thus we let T be 48, 120 and 192 months. Similarly,

[16]The years until the productivity is halved is $\ln(2)/(12\delta)$; thus e.g. $\delta = 0.002$ implies that productivity is down to half after about 29 years, while with $\delta = 0.004$ the corresponding time is only about 14 years.

[17]This value of m may seem high. However, this partially reflects the assumption that underground activity uses state-of-the-art technology (and is obviously untaxed). Indeed, the important term is $1/(1+m)$ in (3) which, in order to generate interior time allocations, must be sufficiently below the net of tax wage. Hence, given our simpligying assumption regarding technology, the value of m needs to be set quite high in order to generate realistic endogenous values.

	Exit Rate			Unemp. Rate		
$T \setminus \theta$	0.4	0.5	0.6	0.4	0.5	0.6
48	34.4	28.0	18.4	5.7	6.9	10.1
120	12.4	9.5	5.3	6.3	8.0	13.6
192	6.8	4.8	1.9	7.1	9.7	21.3

Table 2: Simulated average monthly exit rate from unemployment and unemployment rate.

	$\delta = .002$			$\delta = .004$		
$T \setminus \theta$	0.4	0.5	0.6	0.4	0.5	0.6
48	39.2	58.4	77.4	44.5	62.7	80.9
120	47.0	64.8	82.6	58.4	74.3	90.2
192	54.1	70.7	87.3	70.0	83.9	97.9

Table 3: Simulated fraction of time devoted to underground economic activities by unemployed workers.

we vary the labour income tax rate between 40 and 60 percent, setting θ equal to 0.4, 0.5 and 0.6. (See Table 4.)

Table 2 shows the simulated values of average monthly exit rate from unemployment and the unemployment rate (given the intermediate value $\delta = 0.003$). Comparing with Table 4, if we attempt to map countries to cells in the Table 2, we would say that the South-European countries correspond to the lower left corner of the table, the Nordic countries to the upper right corner, and U.S. and the U.K. to the upper left corner, and other continental European countries, such as France and Germany, to the middle of the table.

Table 3 gives the simulated fraction of time, $(1+m)\,\xi$, devoted to underground economic activities, for two different values of δ. What is striking is how similar underground economic activities are along the opposite diagonal (in particular at high levels of δ). This suggests that one reason why e.g. the Nordic countries can have surprisingly low levels of underground economic activities given their comparatively high levels of taxation, is that they also have relatively fluid labour markets (compared to e.g. the South-European countries). Thus, while high taxes do indeed induce underground economic activity, the fact that the average exit rate of transition into regular employment is comparatively large strongly works in the opposite direction.

The table also illustrates the role of the productivity depreciation rate δ. The larger is δ,

the more inefficient are long tenures; hence when δ is large, increasing T has a larger effect of choking job-creation and thus reducing the average exit rate from unemployment. Hence underground activities are also more responsive to T when δ is large.

Finally, the table illustrates the impact of taxation in the current model. Note in particular how taxes have a much larger impact on underground economic activity when there is also substantial employment protection; this reflects the aforementioned complementarity between taxes and slow-moving labour markets in generating incentives for underground trade.

V Conclusions

In the literature on underground economic activities, attempts to explain such activities have focused primarily on taxes, bureaucracy, and corruption. In this paper we raise the question if labour market institutions may also play an important role. A finding that labour supply to the underground economy comes disproportionately from workers with a weak status in the regular labour market, e.g. unemployed, young, etc. clearly suggest that the functioning and the fluency of the labour market may be a key factor; we also report that (for 15 OECD countries) a standard index of employment protection is considerably more correlated with the size of the shadow economy than are taxes.

Employment protection has been very much in focus in the literature on unemployment. Attempts to measure employment protection have revealed significant cross-country differences. The jury is still out regarding the empirical question of whether or not employment protection increases unemployment. However, there seems to be consensus that a key effect of employment protection is to slow down the flows in the labour market. In this short paper we have set out to link employment protection to underground economic activity, stressing exactly the slowing down of labour market flows.

The model focused on participation in underground activities by currently unemployed and showed that slower flows have, in general two effects on incentives that go in opposite direction. On the one hand, when jobs last longer they are more attractive, hence increasing the incentives for job search (and, conversely, reducing the incentives for participation in the underground economy). On the other hand, employment protection also reduces the attractiveness for employers to create regular jobs; hence the average re-entry rates into employment are reduced which reduces the incentives for job search. We showed that the second effect dominates, whereby we concluded that institutions that prolong job tenure also tends to increase

the incentives for current outsiders to seek alternative sources of income on the fringe of the economy.

Higher labour taxation also encourages underground economic activities for standard reasons. We argued that differences in labour market institutions and the functioning of labour markets may help to explain the pattern of underground economic activities across OECD countries. Focusing only on taxes as a determinant of the shadow economies, it is somewhat puzzling that e.g. the Nordic countries do not have larger shadow economies. We argue that a partial explanation for this may be that the labour markets are relatively fluid in these countries (compared to e.g. the South-European countries) with substantially higher re-entry rates into regular employment.

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Country	ShadowEc	EmpProt	Tax Wedge	Exit Rate	ACJT
Austria	7.3	2.3	0.60	NA	NA
Belgium	21.6	2.5	0.50	0.05	17.5
Canada	15.0	1.1	0.52	0.28	2.8
Denmark	18.1	1.5	0.60	0.12	8.2
France	14.8	2.8	0.68	0.05	16.7
Germany	13.9	2.6	0.54	0.08	17.8
Ireland	15.6	1.1	0.42	NA	NA
Italy	26.2	3.4	0.71	0.04	NA
Netherlands	14.1	2.2	0.45	0.06	14.4
Norway	18.5	2.6	0.60	0.29	7.5
Spain	22.6	3.1	0.46	0.02	23.8
Sweden	18.9	2.6	0.74	0.29	8.9
Switzerland	6.9	1.5	0.37	NA	NA
Portugal	NA	3.7	0.39	0.04	30.7
UK	12.6	0.9	0.47	0.19	4.3
USA	9.0	0.7	0.46	0.4	2.8

Table 4:

ShadowEc: The size of the shadow economy in 1995 (as percent of GDP); the data are taken from Schneider (2000), Table 1.

EmpProt: OECD employment protection index. From OECD Employment Outlook, June 1999, Table 2.2 (Overall employment protection legislation strictness, Version 2, Late 1990s).

Tax Wedge: The sum of the employment tax rate, the direct tax rate, and the indirect tax rate in 1995. Obtained from Nickell et al. (2002). Data together with detailed documentation is available at http://cep.lse.ac.uk/.

Exit Rate: Average monthly exit rate from unemployment. Derived from data on monthly inflow rates to unemployment and unemployment rates, 1980-1995, obtained from Nickell et al. (2002). (Exit rate for Italy is from Dell'Arringa and Lucifora).

ACJT: Average complete job tenure (years). Derived from data on monthly inflow rates to unemployment, 1980-1995, obtained from Nickell et al. (2002).

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