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FISCAL AND REGULATORY CAUSES OF UKRAINE'S SHADOW ECONOMY

Summary

A model of Ukrainian shadow economy money demand is estimated that includes new regulatory burden, tax complexity, and soft-budget constraint variables. This model is analyzed to determine the causes and dynamics of the Ukrainian shadow economy and to assess the effectiveness of state measures undertaken to reduce its size. We find the direct tax burden including social security contributions, the regulatory burden on enterprises, the complexity of the tax system, and soft-budget constraints for enterprises to be important causes for unofficial activity. We conclude that the lowering of the social security burden, the introduction of a presumptive tax for small and medium-sized businesses, and some hardening of budget constraints for enterprises are the main explanatory factors for the estimated decline of the shadow economy since recently. We also conclude that the government could do more to reduce the shadow economy foremost by lowering the effective regulatory burden on enterprises but also by reducing the complexity of the tax system and the personal income tax burden, and by hardening further the budget-constraints for enterprises.

1. Introduction

During the second half of the 1990s Ukraine has implemented considerable changes with regard to taxation, social security contributions and the regulatory regime for enterprises. Some of these measures were aimed particularly at reducing the size of the shadow economy as, for instance, the lowering of the social security contributions and the introduction of the presumptive tax for small businesses. It is therefore necessary to analyze their effects on the shadow economy. We study the causes of the shadow economy on the basis of an estimated demand for currency function. From that we also examine the dynamics of the shadow economy. Unlike other estimates of it, based on electricity consumption, surveys and

household expenditures, a money demand model can provide answers not only regarding the evolution of its size but also regarding the effect of particular policies.

Section 2 describes briefly the reform background, section 3 presents our currency demand model, section 4 explains the results from this model and evaluates policy simulations. Section 5 compares the results with those obtained from using electricity consumption measures. Section 6 summarizes the policy implications.

2. Reform background

Already in 1995 the "income" tax for enterprises was replaced by a corporate profit tax with a moderate tax rate of 30%. Taxes and levies on exports were abolished.[1] The top marginal personal income tax rate was reduced from very high rates during 1993 and 1994 to 50% in late 1994 and further to 40% in fall 1995. Social security contributions were drastically lowered in steps during 1997-1999 from 52 percent of the gross wage to around 40 percent. The regulatory burden on enterprises was supposed to be lowered by way of orders to state agencies in 1998 to coordinate and reduce their inspections of enterprises. Also during this year a very moderate and optional presumptive tax for small and medium sized businesses was introduced. These measures may have considerable importance in dampening shadow economic activity since the tax burden has been identified as the most important problem for enterprises irrespective of their size. In addition, it was also thought that the large share of transactions carried out using non-monetary forms of payment such as barter operations and inter-enterprise arrears was to some extent associated with unofficial transactions and at least partly attributable to relatively soft budget constraints for enterprises. Therefore an attempt was made to "harden" these budget constraints by way of reducing the share of subsidies in GDP on the expenditure side of the budget during the latter half of the 1990s (although the quantitatively more important subsidies to enterprises in the form of tax exemptions as a share of GDP remained relatively stable). In addition, measures were taken especially in early 2000 to increase transparency and simply forbid non-monetary transactions in the energy sector.

3. Estimation of a model for currency demand

The basic idea is to use the fact that transactions in the shadow economy are usually carried out by using cash and not deposits. One needs to estimate an equation that explains currency holdings where the explanatory variables are separated into those which explain „legal" cash holdings and those, which explain cash holdings for the purpose of shadow economic activity („illegal" currency). Then this „illegal" cash has to be multiplied by some assumed velocity so as to obtain the shadow economy GDP. For statistical reasons the dependent variable in the estimated currency demand equation is often not currency itself but the ratio of currency to some money aggregate like M2 (currency plus deposits). Our model is an equation where the ratio of currency to M2 is explained by traditional factors and by causes for unofficial transactions. (A detailed explanation of our model and of all variables is contained in Institute of Economic Research and Policy Consulting (IER), Working Paper No. 9. The construction of indices for the regulatory burden and tax system complexity is also explained there). We use only currency and deposits denominated in Hrivnia, because a broader definition of money to include foreign currency and foreign currency deposits did not yield statistically satisfying results. Therefore, the shadow economy which is financed by using foreign

[1] Transitory export taxes on livestock, oilseeds and a few other goods were, however, introduced in the late 1990s. These are examples of many minor and some more substantial setbacks to a consistent reform strategy that occurred in almost every policy area making an objective assessment of the reform progress difficult.

currency (especially US-Dollars) has to be estimated separately (IER, Working Paper No. 9, appendix C).

In our model we assume the following causes for the shadow economy:
- the direct tax burden,
- the indirect tax burden,
- the social security burden,
- the effective regulatory burden,[2]
- the complexity of the tax system, and
- we consider in the model real overdue inter-enterprise arrears, which can be assumed to represent soft budget constraints for enterprises, because in the absence of soft budget constraints the arrears would very likely be much lower. But it is not clear whether these arrears are associated with unofficial transactions. Therefore, we calculate two scenarios. In one scenario the arrears are assumed to be associated with unofficial transactions. In another scenario the arrears are assumed not to be related to unofficial transactions.

Finally, we consider in the model a variable that represents the influence of the introduction of the presumptive tax for small and medium-sized businesses in 1998 in order to test what effect it had on the shadow economy.

Given the lack of knowledge about the velocity of currency in the shadow economy, one needs to make an assumption. We use actual currency velocity.[3]

4. Results

Our estimations show that statistically significant determinants of the currency-M2 ratio and thus causes of the shadow economy are:
- the direct tax burden, with or without social security contributions. In particular, among the tax variables, the personal income tax has always been the most significant explanatory variable;
- the effective regulatory burden on enterprises;
- the complexity of the tax system.

Real overdue inter-enterprise arrears are also a significant explanatory variable. Their increase reduces the currency-M2 ratio. This effect can mean that they are a cause for the shadow economy, if arrears are used for unofficial transactions. Or it can mean that arrears replace currency and there is no relationship with the shadow economy. These two possibilities result in two scenarios.
The introduction of the presumptive tax for small and medium-sized businesses in 1998 had a statistically significant negative effect on the shadow economy.
The indirect tax burden was not found to be a statistically significant explanatory variable and thus not a significant cause for shadow economic activity.

Table 1 provides an index of the shadow economy's share in GDP for the two scenarios concerning inter-enterprise arrears (column 2, panel A and B). We present an index of the shadow economy's share in official GDP and not its estimated levels, because we are

[2] See: Institute of Economic Research and Policy Consulting, Working Paper No. 9, for an explanation of the construction of this index and the index for complexity of the tax system.
[3] Different velocity assumptions influence the estimates of changes in the shadow economy not with regard to the most recent years 1999 and 2000 because the annual averages of all velocities remained nearly constant during this period. They influence the estimates for the earlier period 1993-1998 such that when using other velocities than actual currency velocity, the shadow economy would grow more rapidly until 1997 than shown in our scenarios (see IER, Working Paper No. 9).

interested in the effects of changes of economic policies and can avoid assumptions about the level of shadow economy velocity, since only the velocity trend is needed.

The estimates in the second column suggest that the shadow economy's share reached a peak in 1997. Between 1997 and 1999 it declined considerably but rose again during 2000.

Table 1
Evolution of the shadow economy
(Estimates based on an equation explained in Institute of Economic Research and Policy Consulting (IER), Working Paper No. 9, 2001)

Year	Index of Shadow Economy share of GDP	Simulation 1: Tax burden at average level of 1993-94 (prior to reforms) and no presumptive tax	Simulation 2: No introduction of presumptive tax for small and medium sized enterprises	Simulation 3: Regulatory burden constant at level of 1993	Simulation 4: Complexity of tax system constant at level of 1993	Simulation 5: Regulatory burden and complexity of tax system at level of 1993	Simulation 6: Real overdue inter-enterprise arrears at level of 1993	Simulation 7: Avoidance of policy mistakes (Regulatory burden, complexity of tax system, and inter-enterprise arrears at level of 1993)
Panel A: Assuming inter-enterprise arrears are associated with unofficial economic activity								
1993	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
1994	1,06	1,06	1,06	0,86	0,99	0,79	1,06	0,80
1995	1,24	1,32	1,24	0,82	0,98	0,64	1,23	0,64
1996	1,45	1,55	1,45	0,84	1,09	0,62	1,42	0,59
1997	1,59	1,68	1,59	0,85	1,20	0,63	1,55	0,59
1998	1,55	1,69	1,55	0,85	1,10	0,59	1,52	0,55
1999	1,37	1,66	1,52	0,72	1,03	0,53	1,33	0,50
2000	1,48	1,86	1,64	0,73	1,09	0,53	1,44	0,49
Panel B: Assuming inter-enterprise arrears are not associated with unofficial economic activity								
1993	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
1994	1,12	1,12	1,12	0,91	1,04	0,83	1,10	0,81
1995	1,25	1,34	1,25	0,83	0,97	0,63	1,28	0,65
1996	1,36	1,46	1,36	0,78	0,97	0,55	1,49	0,60
1997	1,41	1,50	1,41	0,75	1,00	0,52	1,63	0,59
1998	1,38	1,51	1,38	0,74	0,91	0,48	1,60	0,55
1999	1,21	1,50	1,36	0,63	0,85	0,43	1,38	0,49
2000	1,31	1,70	1,47	0,64	0,90	0,43	1,48	0,48

Source: Authors calculations.

The impact of various factors on the shadow economy is demonstrated by simulations (columns 3-9, Table 1). They show how the shadow economy would have evolved had particular policies been different while leaving the other variables unchanged. Simulation 1 shows that without the implemented tax reforms, the shadow economy would have increased nearly continuously and reached a much higher level by 2000.

The presumptive tax for small and medium-sized businesses (simulation 2) is estimated to have reduced the shadow economy's total size during 1999 and 2000 by about 11 and 12 percent in panel A, and by 12 and 14 percent in panel B.[4] Apparently, the dampening effect of the presumptive tax on the shadow economy became stronger. This may be judged to be a very respectable success. The estimate is qualified by the fact that the dummy could also capture other effects.

By contrast, had it been possible to prevent the regulatory burden from rising, the shadow economy would have declined nearly continuously (simulation 3). Had the government not increased the complexity of the tax system, the shadow economy would have remained

[4] To obtain these percentages, the difference between the figures in columns 4 and 2 has to be divided by the figures of column 2.

relatively stable at its initial level (simulation 4). Had both the regulatory burden and the complexity not increased over time, the shadow economy would have declined continuously (simulation 5). Had enterprise arrears not increased, growth of the shadow economy would have been considerably dampened (simulation 6). Simulation 7 captures the effect of "avoidance of policy mistakes": Had the regulatory burden and tax system complexity not increased and had the government even hardened budget constraints for enterprises and thus prevented the rise of their overdue arrears, the shadow economy would have been reduced by more than half in 2000.

The simulations also explain shadow economy dynamics. Growth of the shadow economy's share during 1993-97 was caused by three factors: increases of the regulatory burden, of tax system complexity and of overdue inter-enterprise arrears. Factors that reduced it since then were reduced tax system complexity during 1998-99, the introduction of the presumptive tax, less overdue inter-enterprise arrears, and a continuation of the decrease of the tax burden, especially lower social security contributions. Despite continued decreasing tax pressure, growing acceptance of the presumptive tax and lower real overdue inter-enterprise arrears, the shadow economy's decline appears to have been halted in 2000. This is due to increases in the regulatory burden and tax system complexity.[5] The results from 2000, while only one year, caution policy makers concerning the importance of consistent policies to reduce the size of the shadow economy.

Finally, the simulations reveal that the single most important contributor to unofficial activity is the regulatory burden, followed by tax system complexity, the tax burden and inter-enterprise arrears.

5. Comparison with estimates based on electricity consumption

Our results are based upon "shadow" money demand estimation combined with actual velocity. The approach most used in estimating shadow economies in transition countries is based on comparisons of real GDP growth with electricity consumption.[6] We have performed such calculations using Ukraine's official data on total electricity consumption, real output growth, using two elasticity assumptions to yield two scenarios.[7]

Table 2 contrasts these scenarios with the results from our monetary approach scenarios. To facilitate the comparison both sets of indices are set to 100 in 1993, the first year of our data. According to the electricity approach the shadow economy's share in GDP jumped upwards in 1994, grew until 1996 and then fell off very rapidly. By contrast, the monetary approach

[5] Does consideration of unofficial transactions financed by money substitutes and foreign currency alter the conclusion suggested by table 1 that the shadow economy reached a peak in 1997 and shows a trend decline since then? To the extent that the variable overdue inter-enterprise arrears is a good proxy for money substitutes such as barter and other non-monetary transactions, our estimates shown in panel A of table 1 already consider their effect on currency holdings and on the shadow economy. Regarding use of foreign currency as a financing means, the discussion in IER, Worlking paper No.9, appendix C, suggests that indicators of this use are not in conflict with concluding that there is a trend decline of the shadow economy.

[6] All what is needed to estimate the shadow economy's evolution in this approach is the growth rate of electricity consumption, the growth rate of real official GDP and an assumption about the elasticity of electricity consumption with respect to total GDP. The gap between estimated total output and official GDP can then be taken as an indicator of the size of the unofficial economy.

[7] In the first we assume that elasticity equals .85 during the downturn (on the assumption that much energy is wasted when output declines) to obtain a lower bound estimate for the shadow economy. This assumption is equivalent to an elasticity of 1.18, the inverse of .85, during the economic upswing, which occurred since 2000. The second scenario uses a unitary elasticity. Consequently, scenario 2 yields higher shadow economy estimates than scenario 1.

shows a relatively smooth increase until 1997 and since then a moderately declining trend interrupted in 2000. Another major difference between these results is that according to the first electricity scenario 1 (which reasonably argues that some energy is wasted during the economic downturn), the Ukrainian shadow economy was 3% lower than in 1993 whereas according to the monetary approach it was 30-50% higher!

Table 2
Comparison of indices of the shadow economy

	Index of the shadow economy share in official GDP (1993=100)			
	Electricity consumption approach		Monetary approach	
Year	Scenario 1 Assuming an output elasticity of electricity consumption of .85 when output falls 1/	Scenario 2 Assuming an output elasticity of electricity consumption of unity	Assuming inter-enterprise arrears are associated with unofficial economic activity	Assuming inter-enterprise arrears are not associated with unofficial economic activity
1993	100	100	100	100
1994	138	145	106	112
1995	154	166	124	125
1996	159	177	145	136
1997	152	173	159	141
1998	136	161	155	138
1999	125	152	137	121
2000	97	122	148	131

1/ This is equivalant to an elasticity of 1.18 when output increases.
Source: Authors calculations.

We suggest that the money demand results are more reliable because they are based on an empirical model that yields good results, while the electricity model appears based on business cycle features.[8] Moreover, only the monetary method can estimate the causes of the shadow economy and identify the impact of individual policies. Unlike the electricity method, policy conclusions can be drawn, and our results show that policy reversals can have immediate negative consequences.

6. Conclusions

Money-demand estimations provide new evidence on the evolution and causes of Ukraine's shadow economy and on the effectiveness of policies implemented to dampen it. The effective regulatory burden appears to be quantitatively more important than the tax and social security burden.

The estimations concur with previous estimates that Ukraine's shadow economy has been attenuating in recent years. But our results suggest growth and decline of the shadow economy's share in official GDP were much more modest than suggested by electricity. Most importantly, our approach provides particular policy reasons for the decline: The factors that contributed to the reduction of the shadow economy's share since its peak in 1997 have been

[8] In the electricity approach the decline of the shadow economy since about 1995 is simply the result of the bottoming out of the recession which is associated with some improvement in energy efficiency. (The negative growth rates of electricity consumption declined much less than those of real GDP in absolute terms). But the improvement in energy efficiency could have been expected when considering the row of energy price shocks since about the early 1990s, which hit especially industrial consumers but since recently also private households. Soft budget constraints certainly dampened these effects but did not eliminate them. Also the substitution effects from one energy source to another one may have been minor because over the longer term relative price changes among different types of energy were not pronounced and investment was relatively low, which would have been required to replace one energy type by another one.

the decrease of the tax burden, especially lower social security contributions and the introduction of the presumptive tax, reduced tax system complexity (until 1998), and a decline in real overdue inter-enterprise arrears (suggesting a hardening of budget constraints). In Ukraine, the regulatory burden appears to be the prime cause. Despite efforts to reduce it, we do not find evidence of success.

Based on these findings, policies that could contribute to reducing Ukraine's shadow economy would be first and foremost a serious reduction in the effective regulatory burden on enterprises. The institution of a central agency responsible for deregulation may be meaningless as long as any other government organs are not coordinating seriously their regulatory plans and actions with this agency.
Second, a tax reform that simplifies the tax system, including a reduction of the number of taxes and exemptions and that reduces particularly the personal income tax burden could reduce the shadow economy.[9] Among the direct taxes, we found that the personal income tax is a highly significant explanatory factor for unofficial activity. This may not be surprising because there has been a continuous increase of income taxation in real terms given that the personal income tax has not been reformed since 1994 while inflation was high.
Third, social security contributions should not be increased again if the shadow economy is to be lowered.
Fourth, given that indirect taxes appear not to be a significant explanatory factor, it could be argued that the VAT rate can be set relatively high. Considering also that income earned in the shadow economy tends to be spent on official markets where VAT is paid, and that VAT is a tax on consumption and not on savings and investment, maintaining a relatively high VAT could be a reasonable way of taxing some unofficial income without being a major cause for it.[10]

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[9] However, there is one qualification. Those minor taxes on purchases on foreign currency, homes and jewelry that were introduced in 2000 to improve the financing of the pension fund are meant to contain the social security contribution rate while improving the credibility of the pension system at relatively low additional administrative costs. We do not want to argue that for the purpose of simplification these taxes should be withdrawn again. We believe that indeed the social security contribution rate should be contained, the credibility of the system should be improved, and there are tasks and responsibilities of the pension system, which should be financed by taxpayers and not only by wage earners (such as pensions for former unelected officials etc.). This may justify those special taxes.

[10] However, we do not want to overlook that high indirect taxes can be strong incentives for unofficial activity, especially in the services sector and with regard to goods that can be smuggled easily and are subject to high excise taxes. High excise taxes on such goods provide incentives for bribery and smuggling. Therefore, our view that the VAT rate could be relatively high is conditioned by the paramount goal of moderate taxation at all levels.