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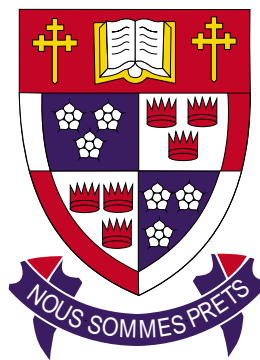
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Why Most Measures of the
“Unofficial Economy” are
Systematically Wrong

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Why Most Measures of the “Unofficial Economy” Are Systematically Wrong¹ With illustrations from Ukraine

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Abstract

This paper argues that the conceptually correct measure of informal economic activity is that which is *unreported* to the authorities. However conventional measures of informal activity are based on that which is *unrecorded* by the authorities. The paper shows that this seemingly innocuous distinction can make a substantial difference to both measurement and policy. Ukrainian data are used to illustrate.

Prelude

As is well known, conventional definitions of “unofficial economic activity” vary widely, as do the terms typically used to describe it. In this paper I will define it as “unreported production and exchange that is normally effected via monetary transactions”. I recognize that the word “normally” is ambiguous, especially in the context of transition economies that often use barter where money would “normally” be used. But my intention is simply to exclude intra-household production and exchange, activity that is normally, in any society, non-money-based (except in some households that are run by hardnosed economists!). Moreover, the empirical studies I will cite most approvingly explicitly assume that all unofficial activity is consummated with cash; hence they exclude barter activity by definition.

¹ I am indebted for comments to Ed Feige and Tatiana Andreyeva.

More contentiously, I intend to distinguish between two types of unofficial activity: those that are *unreported* and those that are *unrecorded*. Unreported activities are those that are not reported to the official statistical authority. Unrecorded activities are those that are not recorded by the official statisticians. The point is that, under pressure and guidance from Eurostat and other agencies, many if not most statistical authorities impute unreported activity into their recorded GDP data; that is, they adjust reported data upward in an effort to capture at least some unreported activity. In other words GDP recorded by official statisticians usually exceeds that which is reported to them. Indeed, if the official statisticians capture *all* unreported, market-based activity, “unofficial economic activity” does not, by definition, exist!

In the previous paragraph I wrote “contentiously”, but after discussing this issue with Ed Feige, an undisputed guru among scholars of unofficial activity, I learned that he has long emphasized the distinction between unreported and unrecorded activity. Feige (1990) proposes a “critical criterion” for distinguishing between formal and informal activity: whether or not the activity adheres to prevailing institutional rules. Under this criterion, he distinguishes between four types of informal activities according to the particular institutional rules they violate: *the illegal economy, the unreported economy, the unrecorded economy and the informal economy*. In this paper, I subsume the illegal economy in the unreported economy. Moreover I do not distinguish between the informal economy and the unreported economy. I simply define informal activity to be one and the same as unreported activity: money-based activity that is not reported to the authorities. The probable motive for not reporting is either to avoid taxes or time-consuming red-tape, to avoid penalties for illegal activity, or both. I define the recorded economy as measured GDP: that is, measured by the statistical authorities.

Finally, I follow Feige (1998) in defining “official” GDP (hereinafter called National Income or just Income) conceptually rather than pragmatically. Feige uses the adjective “official” conceptually in the same sense as he defines “formal”: to describe activity that adheres to prevailing institutional rules and hence is reported to the authorities. The alternative, more common definition of “official” is pragmatic: it refers to activity that is recorded officially by the statistical bureau. Such a definition includes some non-reported activity if the official statisticians adjust reported data upward.

In short, I am assuming that

Official (National) Income = Formal Income = Reported Income

Unofficial Income = Informal Income = Unreported Income

Also I assume that

Total or “true” Income = Official Income + Unofficial Income = Reported Income + Unreported Income.

But because most countries' statistical authorities adjusted reported Income upward to account for unreported activity, I do NOT assume that Measured Income = Reported Income. In general

Measured or Recorded Income = Reported Income + Some Unreported Income, and

Unmeasured or Unrecorded Income = Unreported Income not already included in Measured Income = Total Unreported Income minus Measured Income.

A central conclusion of this paper will be that under plausible circumstances, the conventional estimates we call “unofficial GDP” are substantial underestimates of the informal economy, both of its level and of its growth. This conclusion follows directly from the above seemingly innocuous assumptions. In short, the conceptually meaningful measure of informal activity is:

Unreported income / Reported income

NOT the usual measure of “unofficial” activity, which is

Unrecorded income / Recorded income.

Ukrainian data and estimates will be used to illustrate.

Already included in measured GDP?

If unreported activity is nevertheless recorded in measured GDP, much concern over macroeconomic informal activity is misplaced. If, after all, measured GDP data is credible, it provides a generally adequate guideline for most economic policy that is strictly *macroeconomic*: decisions about monetary growth, interest rates, aggregate expenditure and tax policy. Only policies that hurt or help particular sectors of the economy will be misguided by measured GDP data that includes unreported activity, and then only if such activity is concentrated in certain sectors and if, in addition, policymakers are agreed that such activity is to be discouraged or encouraged relative to reported activity. Of course it is possible to argue that many so-called “macro” tools, particularly taxes, impinge by definition on particular sectors: for example, personal income taxes on households or corporate taxes on businesses. Expenditure levies such as sales or VAT taxes have less sector-specific impacts. While “correctly” measured GDP would not provide a wholly adequate guideline for macro policy, it would nevertheless be reassuring.

Mel'ota and Gregory (2001) provide evidence that for Ukraine, at least, much unreported activity is indeed recorded in official GDP. Ukraine's state statistical agency, Derzhkomstat (DKS) has adjusted for such activity since 1995, following recommendations of such international agencies as Eurostat. DKS adjusts for two types of unreported activity: household and enterprise. For the former they

adjusted GDP upward by 15.6 percent in 1999, and for the latter by 3.6 – 4.6 percent, for a total adjustment of about 20 percent.

The biggest contributions to this 20 percent are from agriculture (9 percent), followed by trade (4 percent) and industry (3 – 4 percent). The entire contribution from agriculture is attributed to households as opposed to enterprises (“non-financial corporations”). Likewise, households are credited with substantial unreported activity in construction, the fishery, consumer services and “housing and communal”, whereas unreported activity in enterprises is assumed in all those sectors to be zero. Moreover households are credited with double the enterprises’ unreported contribution to trade. In sum, DKS attributes more than three quarters of unreported value-added to households and only one-quarter to non-financial enterprises.

Mel’ota and Gregory take issue with the DKS’s assumptions that the bulk of unreported activity takes place in households as opposed to enterprises. In their words, “The Ukrainian stereotype suggests, to the contrary, that a special feature of Ukraine’s [informal economy] is that it is carried out by large enterprises” (p. 3). As examples they cite newspaper and anecdotal reports of illegal expenditures and asset stripping in the state-controlled energy and fuel enterprises. While it is true that households play a dominant role in unreported agriculture and trade, the DKS adjustments fail to account for the likely substantial unreported enterprise activity in industry. It is likely that their upward adjustments for enterprises in construction and in trade (7 percent and 14 percent, respectively) are also too low.

To buttress their argument, Mel’ota and Gregory compare Ukraine’s adjustments with those made by 10 other transition economies plus Cyprus, all of them candidate countries for membership in the European Union, and all of which used the same adjustment methodology. As suspected, Ukraine’s adjustments in both agriculture and industry are outliers. Ukraine’s DKS adds 70 percent to agriculture versus a 13 percent average for the 11 comparison economies, and only 6 – 9 percent to industry versus an average of 10 percent for the comparison group. Given that the industrial sector accounts for 33 percent of Ukraine’s GDP, versus only 13 percent for agriculture, removing these discrepancies by assuming unreported shares closer to the comparison-group average would increase the appropriate upward adjustment to Ukraine’s GDP: for example raising the industrial estimate to 10 percent would raise Ukraine’s overall GDP by 2.5 percent.

As a second check on the DKS numbers, Mel’ota and Gregory compare household expenditures and incomes as documented by a household budget survey conducted in 1999. Expenditures reported on this survey exceeded reported incomes by almost 50 percent. This translates into some 17 percent of GDP. If, moreover, a plausible savings rate is attributed to Ukrainian households – they attribute 16 percent rather than the implausible 1.4 percent declared by respondents to the survey – the excess of expenditure over GDP increases from 17 percent to 22 percent of GDP. In short, these survey-based expenditure and income data point to a level of unreported

economic activity consistent with DKS's sector-based upward adjustment of GDP by 20 percent.

As a third and final check on the DKS numbers, Mel'ota and Gregory compare 1999 Ukrainian data on GDP-by-end-use with GDP-by-sector-of-origin. Given the remarkable consistency between these two figures, they conclude that the DKS must calculate its end-use figure for consumption as a residual, on the assumption that its sector-of-origin figure is accurate. If the (much larger) household budget survey figure for consumption is substituted for the DKS figure, official GDP is increased by 11.6 percent. In short, Mel'ota and Gregory suggest that the DKS upward adjustment of GDP by 20 percent for unofficial activity should be increased to 32 percent.

Double counting?

If we are to accept the Mel'ota and Gregory argument and evidence, Ukraine's recorded GDP figures already account for about two thirds of unofficial activity by adjusting reported activity upwards by 20 percent. Their implication is that adjusting recorded GDP upward by another 12 percent would capture all unreported activity. But this 12 percent figure seems grossly at odds with other estimates of unrecorded activity.

Since 1995, other estimates of the size of Ukraine's unrecorded economy have hovered around 50 – 60 percent of recorded GDP. But the DKS has been applying its roughly 20 percent upward adjustment of GDP since 1995. Does this imply that other estimates are double counting: i.e. that an estimate of 50 percent should be reduced by 20 percent?

Consider estimates based on "physical input", usually electricity consumption. They compare GDP based on actual electricity consumption with the DKS's reported GDP. In fact they should compare the input-based estimate with GDP *net of* the DKS's adjustment. For example if the DKS records measured (reported plus 20 percent extra to account for unreported) GDP at 120 and the input-based estimate is 180, informal GDP is said to be 60/120 or 50 percent of measured GDP. However this measure captures only that part of unreported GDP which is also unrecorded. In fact, reported GDP is only 100 and hence total unreported GDP (recorded plus unrecorded) is 80, or 80 percent of reported! Recall that

measured = recorded = reported plus recorded unreported
unmeasured = unrecorded = both unreported and unrecorded.

What about estimates based on currency demand? Stripped to its basics, this method estimates a "normal" currency demand assuming no unreported activity, and then attributes excess currency holdings to unreported activity, translating stocks of currency into flows of income via a "normal" estimate of velocity. Such measures, like input-based estimates, are conventionally expressed as a fraction of

measured GDP; to the extent that the latter already includes at least some unreported activity, currency demand measures also underestimate the fraction of GDP that is unreported. In fact *any measure of informal activity that wrongly assumes that recorded GDP data excludes all unreported activity underestimates the latter.*

Does this bias apply to growth figures? Suppose in the example above that recorded GDP grows between year 1 and year 2 by 10 percent, from 120 to 132. This recorded figure includes the DKS's add-on, which we assume has remained constant at 20 percent, under their assumption that the share of unreported activity remains constant. In that case recorded GDP = reported + (some) unreported = 110 + 22 = 132. Suppose also that an independent, non-government estimate of unrecorded, so-called "unofficial" GDP remains at 50 percent of recorded GDP, or 66. Then unrecorded GDP as a fraction of *reported* activity has now risen from 50/100 to 66/110 or from 50 percent to 60 percent in one year! In other words if conventional measures find "unofficial" GDP to be a positive, constant fraction of officially recorded GDP as the latter grows, and if the statistical authorities are adjusting reported GDP upward by a fixed fraction under the assumption that the share of unreported activity is constant, then the one figure that should be most conceptually meaningful, namely unrecorded GDP as a fraction of reported GDP, tautologically rises. *Put simply, if conventional estimates find unrecorded GDP to be a constant fraction of recorded GDP, and if statistical authorities are adjusting reported GDP upward under the assumption that unreported is a constant fraction of reported, then the true ratio of the unreported economy to the reported must, in fact, be rising. Or conversely, and perhaps more plausibly, if we assume as our null hypothesis that the true ratio of the unreported to reported activity is constant, conventional estimates of the ratio of "unofficial" GDP to "official" should continuously fall as "official" GDP grows.*

Does this distinction between the conventional and "true" share of unreported activity matter? No, it does not if we are concerned only with the aggregate figure, reported plus unreported GDP. There is no "double counting". "Unrecorded" simply means "unrecorded by our official statisticians", but we can add conventional estimates of unreported activity to recorded GDP and, in principle, cajole our official policy-makers into setting macroeconomic targets consistent with true, total activity, rather than an underestimate.² But yes, the distinction does matter to the extent that we care about the gap between total and reported income rather than just the gap between total and recorded income. Households and businesses do not report income primarily because they are evading taxes, because their outputs are illegal, or both. Both kinds of activities are of considerable concern to governments. Definitions do matter.

² Feige (1981) has made this point forcefully, suggesting that much of the UK's measured recession in the 1970s was illusory, and that macroeconomic policy based on official GDP data was potentially inflationary.

To repeat, the conceptually meaningful definition of the informal economy is:

Unreported income/reported income

Instead, most researchers measure:

Unrecorded income/recorded income, which they call “unofficial economic activity” (relative to GDP).

In this context it is interesting to speculate that governments may have quite different concerns from those of independent think-tanks and academics. Governments usually want to rope unreported into reported activities in order to increase tax revenue. Independent policy-advocates – De Soto³ and his followers are prime examples – often recognize that unreported activity is the life-blood of many economies and that attempting to tax it could be counterproductive. This message may well apply to Ukraine, where there is evidence that official labor force participation is particularly sensitive to taxes (Khmilevska, 2002). There is also evidence for Ukraine that labor productivity in the unreported economy is higher than in the reported (Novoseletska and Najman, 2001).

Finally, there is evidence for Ukraine that the official and unofficial economies are complements rather than substitutes (Dzvinka, 2002). The usual theoretical reason adduced to explain such complementarity is demand-based: spending from a thriving unrecorded economy is spent on recorded output. But there is also a supply-side reason that is probably particularly important in Ukraine: as already suggested, many if not most formal enterprises engage heavily in informal activities, both by making unrecorded sales of their outputs and by making unrecorded payments for their inputs, particularly labor. In fact enterprises are often blatant enough about their double-dealing that they form “subsidiaries” for their less formal activities.

A second speculation, consistent with the premises of public choice models based on interest-group politics, is that governments in transition economies may be predisposed to underestimate unrecorded activity to the extent that it is co-mingled with the activity of enterprises, both state-owned and private, that are part of the formal economy. Although this runs against governments’ desire to capture tax revenue, it may be consistent with a stronger motive, namely the need to shelter their own kind. Employees of enterprises who are paid part of their salaries in cash, not to mention managers and “oligarchs” who “strip” assets and output, or at the very least take untaxed profits, are sheltered from scrutiny to the extent that government statisticians fail to recognize their incomes and factor them into GDP. If such illegitimate incomes were explicitly reported, pressure to clamp down on them might be irresistible. Better to turn a blind eye than disrupt the informal, under-the-table arrangements that sustain employees’ incomes and induce them to remain registered as part of the formal labor force. Better to turn a blind eye than disrupt

³ See De Soto (1989).

the accounting fictions that keep large enterprises alive and reward oligarchs who are inextricably intertwined with the government that decides what economic activity to record and what to ignore.⁴ Such incentives may help to explain why the Ukrainian DKS records most large enterprise incomes at reported levels, rather than adjusting them upward as it does incomes from household enterprises.⁵

This brings us to the most recent estimates of Ukraine's informal economy.

Disparate estimates of Ukraine's informal economy

Schneider and Enste (1999) report two physical input measures of Ukraine's "shadow" economy as a percentage of GDP for the average of 1994-95 at 47.3 and 53.7. Theissen's (2002, Table 4) most plausible⁶ electricity-based estimates for 1994 and 1995 respectively are 38 and 54 percent above 1993 levels, rising to a peak of 59 percent in 1996 but then falling to - 3 percent (3 percent below 1993) in 2000. Theissen's most plausible⁷ currency-demand-based estimates range from 6 percent above 1993 in 1994 to a peak of 59 percent above in 1997, and 48 percent above in 2000.

The most up-to-date estimates for Ukraine of which I am aware are from Dzvinka (2002, Table 2). His currency-demand-based estimates of the informal economy for 1993 - 2001 are consistently in the range of 55 - 70 percent of measured GDP. Most interestingly, his estimates, which are quarterly, remained in the 55 - 60 percent range between the beginning of 1999 and the end of 2001, when measured GDP was growing for the first time since 1990. The so-called "official" (i.e. recorded) economy

⁴ Feige (1998:21) asks "How are we to reconcile [North's 1990] 'glacial' view of institutional change with the radical transformations now under way in Central and Eastern Europe ... Are those evolutions less revolutionary and less discontinuous than they appear? North (1990:91) writes that the outcomes of revolutionary changes will depend on 'the ongoing tension between informal constraints and the new formal rules'. Formal institutions have indeed changed radically in the transition economies, but informal institutions much less so. What can we learn from a closer examination of the informal conventions, particularly when these include norms of noncompliance with the formal rules?" The practices, currently common in Ukraine as well as some other transition economies, whereby enterprises in the formal economy both sell output and pay incomes informally (that is that are "unreported"), exemplifies, I believe, Feige's "norms of noncompliance with the formal rules". Moreover, North's "tension" between these practices and the "new formal rules" of Western accounting is a useful lens through which to interpret some of transition economies' revolutionary changes.

⁵ This phenomenon probably also plagues China's GDP data. Employees of China's state owned enterprises often receive most of their income in "shadow" activity, some of it related to the enterprise and some if not most not related. One suspects that the enterprise-related shadow activity is largely left out of official GDP.

⁶ His most plausible electricity-demand estimates adjust the elasticity of GDP to electricity consumption downward during recessions and upward during booms, rather than simply assuming that the elasticity is constant and unitary.

⁷ His most plausible currency-demand estimates assume that cash used for inter-enterprise arrears is a proxy for unofficial activity.

grew by perhaps 20 percent over those three years, but so too did the “unofficial” (i.e. unrecorded) economy. And by the reasoning of the previous section, this means that unreported activity as a percentage of reported actually increased.

How plausible are such estimates of unrecorded activity for Ukraine, estimates that put unrecorded activity in excess of 60 percent of recorded activity? Ukraine’s unrecorded share has long ranked high by international standards: according to comprehensive global data for 1990-93 provided by Schneider and Enste (1999, Table 2) Ukraine’s “shadow” economy, which they put then at 28 – 43 percent of recorded GDP, was matched by certain African and Latin American and Asian countries but substantially exceeded most countries in Central Europe, the former Soviet Union, and the OECD. Nevertheless a figure of 60-percent-plus is well above the 20 percent sector-based estimates of Ukraine’s official statisticians at the DKS, as well as Mel’ota and Gregory’s calculation that it should be increased to 32 percent.

Electricity-input based estimates, by contrast, show the share of the unrecorded economy contracting (Mel’ota *et al.*, 2001, Thiessen, 2002). However currency-demand based estimates are inherently more plausible than electricity-based estimates. The defects in both are well known, but the essential argument is that currency is a far more fundamental input to a broad range of economic activities than is electricity. As service and trade sectors increase their share in the economy, and heavy industry’s share shrinks, so too does the relative importance of electricity inputs. Moreover one could expect a secular increase in the efficiency of electricity-use in heavy industry as a transition economy modernizes. And finally, the elasticity of electricity consumption to income declines well below unity during upswings, which the 1999 – 2001 period certainly was.

Conclusion: Ukraine as a special case

In conclusion, I will simply list several intriguing characteristics of Ukraine’s informal economy. No one of them is unique to Ukraine, but together they touch on many of the methodological issues that make measurement and analysis of informal economic activity in transition economies particularly problematic.

1. According to most estimates, as well as anecdotal accounts, Ukraine’s informal sector is exceptionally high by global and regional standards, as well as among transition economies.
2. Estimates of both its level and its evolution over time are highly variable.

- 3. Recent evidence suggests that its share of recorded GDP has remained constant despite rapid recent growth in recorded GDP. In short, recorded and unrecorded activities in Ukraine seem to be complements, not substitutes.**
- 4. Taking into account that Ukraine's official statistical service, the DKS, already adjusts reported GDP upward to account for unreported economic activity, estimates of the share of so-called "unofficial" activity, that is, unrecorded activity as a percentage of recorded, are probably severely downward-biased if they are to be interpreted as measures of total informal activity. Unreported activity as a percentage of reported is probably much higher than unrecorded as a percentage of recorded. Moreover, if the official statistical upward adjustment is constant in percentage terms, and if the evidence referred to in 3. is correct, unreported or informal activity has actually been growing in recent years relative to reported or formal activity.**
- 5. Survey evidence for Ukraine suggests that labor productivity in unreported activity may be higher than in reported, not the reverse as usually assumed for non-transition economies. This may be particularly true for non-agricultural sectors. Other evidence suggests that the DKS under-represents non-agricultural sectors in its upward adjustment of reported GDP. Does this mean that movement of labor from reported to unreported activity would increase total growth, and that such unofficial activity should be encouraged?**
- 6. It would appear that in Ukraine, official, DKS estimates of national income/output and national expenditure are not independent. Consumption is calculated as a residual from national output figures. Hence one of the conventional methods for measuring unreported activity is unavailable in Ukraine.**
- 7. The electricity demand method is particularly misleading when applied to Ukraine.**
- 8. The currency demand method remains the most promising for Ukraine. Currency (cash) demand based on transactions volumes (following the method pioneered by Feige, 1979) would be ideal, but transactions data for Ukraine is too limited; hence incomes-based methods supplemented by "Tanzi-type" tax burden explainers (Tanzi, 1980) probably yield the best aggregate estimates. Caution is in order because Ukraine is an unusually cash-based economy: that is, most (small) reported transactions, not just unreported transactions, are effected in cash, in good part because people distrust banks. However variations in the cash/deposit ratio should nevertheless be meaningful indicators of variations in unreported activity. Further caution is in order because Ukrainians also hold large volumes of U.S. dollar cash. These are typically held as stores of wealth rather than**

means of payment, except for large transactions such as paying for an apartment, buying a car or taking a foreign vacation. Attempts to estimate the unofficial economy taking into account the demand for dollar cash have thus far proved unsuccessful.

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