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DISCUSSION PAPERS

The Evolution of the Shadow Economy
in Transition Countries:
Consequences for Economic Growth and Donor Assistance

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Executive summary

Many experts on transition and developing countries claim that a large chunk of economic activity, sometimes half or more, is done in the shadow, i.e., not recorded in official statistics. This suggests that the shadow economy might have considerable influence on growth – or its lack thereof. As such, USAID asked the authors to examine the shadow economy in transition countries with the goal of addressing a few questions. How big *is* the shadow economy in each of the transition countries? Does a shadow economy prevent, merely slow down, or actually promote economic growth and competitiveness, and through what mechanisms? What policy measures would be effective/ineffective in a shadow economy situation? What are the implications for donor assistance?

To understand the reason for the existence of shadow activity, we start by doing a cost-benefit analysis of a firm's decision to operate in the shadow economy. On the benefit side, the firm escapes income and labor taxation, onerous and inappropriate regulation, and corruption in government institutions. Also, where transacting in barter or foreign currency is illegal, operating in the shadow avoids the vagaries of currency instability. On the cost side, it loses access to a variety of public services, which would otherwise help it protect its property rights and facilitate exchange. It also loses access to private sector services such as banking, capital markets, and nonbank financial services.

While these factors may apply to shadow economies around the world, our review of the literature identifies unusual characteristics of shadow activities in transition countries. First, very big and visible firms – including state-owned enterprises – often carry out such activities, and these firms may operate simultaneously in both the shadow and official economies. Second, the decision on where to carry out an activity seems to be quite responsive to the incentive environment.

We then review the various methods found in the literature for measuring the shadow economy. Of these, the physical inputs approach (e.g., total electricity use), and the latent variable modeling approach (which uses shadow cause-and-effect variables to infer shadow size based on an independent base year benchmark) are the most appropriate for the transition country context and we build upon these in this paper. We first develop a modified total electricity (MTE) approach to create panel estimates of the shadow for the period 1990-1997. The idea is to calculate changes in electricity use that could not be attributed to changes in official GDP or to changes in other energy market factors (changes in the composition of output, domestic and international price effects, and efficiency improvements) and to relate them to changes in the shadow economy. As a second approach we use the 1997 MTE observations as a shadow economy indicator and a series of cause variables to estimate a latent model comprising a single-indicator with multiple causes (SIMC). This allows us to estimate the potential of each country for a shadow economy (the latent variable) in 1997, based on the countries' characteristics.

Descriptively, we see that growth or declines in official GDP can be misleading since once changes in shadow activity are accounted for, total economic activity (TEA) can move in the opposite direction of GDP. Using the Sachs, Zinnes, and Eilat (2000a) geography-based clustering, we find that country shadow scores are rather tight within clusters, with the exception of the EU Border States, which bifurcates into "new" and "old" states. (Since "new" states have less mature institutions, this latter result supports our conclusion that the roots of the shadow economy are linked to "institution failure"). While we find no general correlation between the

size of a country's shadow economy in 1990 and later in the decade, we do find a negative (positive) correlation in 1990 (1996) between shadow size and prior membership in the FSU. We also find that our estimates are comparable to others in the literature, showing that the shadow economy is large and has increased over the period of transition, particularly in the FSU-minus-Baltics group. Our study, however, covers more transition countries as well as a longer period (adding 1995-1997). Finally, comparing to countries outside the transition region we find that the EU Border States have shadow sizes comparable to the best-run economies of South America and Asia while the FSU resembles the worst-run economies of Africa and Asia.

Turning to the growth effects of shadow activity, we find that the shadow economy dampens the recessionary impact of a fall in official GDP. We find that GDP growth is accompanied by shrinkage of the shadow economy. The strength of these effects are not symmetric but depend on whether total economic activity is rising or falling. When TEA is falling, a dollar fall in GDP is accompanied by a 31-cent *increase* in shadow activity. When TEA is rising, a dollar increase in GDP is accompanied by a 25-cent *decrease* in shadow activity. This leads to the result that there is *inertia* or hysteresis in the creation and destruction of the shadow economy. This result is corroborated by a parallel result that the deeper the economic collapse over the transition period, the larger the size of the shadow in 1997.

We then undertake a series of bivariate regressions to examine correlations between the level of shadow activity and its causes and effects. On the macroeconomic front we find a strong positive correlation with official unemployment rates and the use of barter or foreign currencies, and a strong negative correlation with (M2/GDP), openness, and domestic and foreign investment. Regarding the taxes, tax *rate* measures have no strong correlation while measures of the quantity of tax revenues correlate negatively. On the microeconomic side, we find a strong positive correlation with corruption, regulation, and poor enforcement and a strong negative correlation with banking and capital market development and rule of law. Finally, regarding sociopolitical factors, the quality of the political and democratic and civil society environment was negatively correlated with shadow size.

These and other related analysis suggest that the shadow economy has several impacts, some negative and some positive, depending on the state of reform. The negative impacts include the weakening of public finances and public investment, an increased instability of monetary policy, inefficient resource allocation, less private sector investment, changes in the composition of output, and "short-termism" in general. In addition a large shadow economy leads to a disintegration of social norms, respect for official institutions, and rule of law. On the other hand, and especially at the onset of transition, the shadow economy also may be beneficial. It increases income-generating opportunities at a time of economic contraction, provides a way around a regulatory system not yet in line with a market economy, offers an additional social safety net, increases competitive pressures on the official sector, and probably enhances entrepreneurship and market experience.

Next we consider the impact of shadow activity on domestic competition and on international competitiveness. We discuss how changes to a market's structure and conduct as a result of shadow activity affect the economy's performance. They do this by impacting on allocative efficiency, resource use (in part from less intermediation and specialization), equity, the rate of innovation and technical progress, and macroeconomic stability. We show how the effect of shadow economy on market structure operates by its effect on firm size, the composition of sector output, and ownership structure. We then examine the effect of shadow activity on market conduct, focusing special attention on pricing, the source of the entry barriers,

and the lower investment intensities of shadow activity. Regarding international competitiveness, we show how countries with larger shadow economies are also those that have lower international competitiveness, as measured by the Sachs, Zinnes, and Eilat (2000b) indicator.

We then turn to policy and donor recommendations. We first consider whether government priorities have been sensitive to the impacts of shadow activity. We check nine policy areas (from Sachs, Zinnes, and Eilat 2000a) and find that, with the exception of the reform of the tax code and administration, the government did not place higher priorities in policy areas that would attenuate other shadow causes. This suggests that the governments fail to appreciate the cumulative and synergistic effects of their weak legal and regulatory environments and the long-term effects of the prolonged shadow activity.

Regarding growth-enhancing policies and the shadow economy, we stress the challenge to design shadow reduction strategies that mitigate the "justified" causes of shadow activity (e.g., bad regulation and bureaucratic corruption) while improving the institutions to attenuate the "unjustified" causes (e.g. weak enforcement, lack of rule-of-law traditions). We consider three types of policies. The first type is policies with multiple benefits (shadow and nonshadow): further liberalization; greater macro-stabilization; better foreign exchange management; better regulation; institutional strengthening; more oversight, transparency, and public participation; continued bank privatization; further decentralization; and strengthening of rule of law. The second type comprises actions that directly target the shadow economy and include the reduced use of barter by the government itself, tax reform, better enumeration by statistical and social safety net authorities, stricter and more strategic enforcement, and better targeting for regulation. Here, we also discuss dynamic considerations such as use of amnesties, the danger of firm exit from the economy altogether, and techniques to encourage time-consistent policy. The third type comprises policies whose effectiveness may be changed by the presence of shadow activity. Aside from the perverse effects of formulating policy based on data which underestimates the extent of economic activity in the shadow, examples of this type include fiscal and monetary policy as well as policies to reform financial markets.

Lastly we turn to donor assistance considerations. We first look at the evidence to date and find that the allocation of total technical assistance across recipient countries has in fact sought to address the causes of shadow activity. Returning to the nine policy areas (from Sachs, Zinnes, and Eilat 2000a) we find that donors do set priorities on reforms that target the causes of shadow activity. Then we address three sets of questions. First, how, if at all, does donor assistance encourage a shadow economy and what aid project or delivery strategies might minimize such negative impacts? Second, what can donors do to reduce negative impacts of a shadow economy? Finally, what are the implications of the shadow economy for aid project evaluation?

While our methodological approach has yielded some productive insights, it is necessary to end this summary by stressing some rather substantial limitations and caveats: First the shadow economy is intrinsically a vague and conceptually difficult entity to pin down. Second, the data we had available are extremely noisy and did not permit a more sophisticated econometric analysis to disentangle the simultaneity problems between the shadow's causes and effects.

Undaunted, we believe there is benefit to future work in this field. There is scope for breaking up the analysis into shadow activity in industry, in agriculture, and by households. There are several areas to pursue on the policy front. More and better data collection is

paramount. The donors need to increase government recognition regarding the impacts of inappropriate policy environments and weak administrative structures on the level of shadow activity as well as the affects of shadow activity itself on economic growth. Finally, more work needs to be done related to policy coordination as well as use of amnesties.

To conclude, the shadow economy is a central feature of the dynamics of transition to a mature, market economy. It is a phenomenon that deserves study in its own right since it carries consequences that would otherwise be overlooked. Whether it becomes a cure or a disease in its own right depends on how fast the state can redefine its role to that of a market facilitator rather than a market planner – in short, it depends on the speed of transition.

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All errors and omissions are solely those of the authors, as are the opinions expressed herein.

List of tables and figures

Abbreviations

CEE	Central and Eastern Europe
EBRD	European Bank for Reconstruction and Development
EU	European Union
FDI	Foreign Direct Investment
FSU	Former Soviet Union
GDP	Gross Domestic Product, as *officially* reported
LDC	Less develop Countries
MIMC	Multiple Indicators with Multiple Causes
MTE	Modified total electric ity (approach)
na	Data not available
NGO	Non-Government Organization
OECD	Organization for Economic Cooperation and Development
SIMC	Single Indicator with Multiple Causes
SME(s)	Small- and Medium-scale Enterprise(s)
TEA	Total economic activity (equal to GDP + shadow activity)
USAID	United States Agency for International Development
WDI	World Bank World Development Indicators

Country codes

ALB – Albania, ARM – Armenia, AZE – Azerbaijan, BGR - Bulgaria, BLR – Belarus, CZE – Czech Republic, EST – Estonia, GEO – Georgia, HUN – Hungary, HRV – Croatia, KAZ – Kazakhstan, KGZ – Kyrgyz Republic, LVA – Latvia, LTU – Lithuania, MDA - Moldova, MKD – Macedonia, POL – Poland, ROM – Romania, RUS - Russia, SVK - Slovakia, SVN – Slovenia, TJK – Tajikistan, TKM – Turkmenistan, UKR – Ukraine, UZB – Uzbekistan

1 Introduction

A casual observer noting the levels of official unemployment in Poland in the first years of the 1990s (over 16 percent) may well have wondered why the country was not in the midst of street rioting, as was Germany prior to the world wars. A similar concern would be raised by the more-than-halving of Ukraine's GDP over the period 1991-1995. Why were these observers wrong?

The conventional wisdom is that this period saw a concomitant surge in the growth of unrecorded – or "shadow" – economic activity. While in the short run this activity was surely good news for the people living in these countries, the implications of the development of a shadow economy for longer term economic recovery and, ultimately, growth remain an unresolved issue.

This paper sets out the issues related to the shadow economy in the context of the economic transition of formerly communist countries, measures its size, and then examines some further questions: What are the implications for economic reform and policy formation in transition countries? Does the existence of a substantial shadow economy carry consequences and implications for donor assistance to the transition economy region?

1.1 Motivation of issues

Many experts on transition countries and on developing countries in general have come under the impression that a large chunk of the economic activity in these countries, sometimes half or more, is done "backstage", i.e., without being recorded in official statistics. This reality may have considerable policy implications on several fronts.

First, policies and research that rely on data may be subject to distortion if not corrected for the biases imposed by unreported activities. Second, the existence of the unofficial economy may have a direct effect on the growth, competitiveness, and income distribution of the country. Such effects, however, may be positive or negative. On the negative side, existence o fan unofficial economy may impose constraints to public revenue generation and, therefore, limit the provision of public goods that are essential for growth. On the positive side, it may act as a temporary lever for promoting businesses and creating wealth in a country where bureaucracy and government corruption may block productive activities. Finally, while the sheer size and modality of delivery of donor assistance can, themselves, often influence the growth of the unofficial economy, technical assistance in such areas as civil service reform, tax and trade reform, and deregulation can be a major force in its attenuation.

1.2 Description of project

There is a large literature on the shadow economy as it pertains to less developed countries (LDCs) and the OECD advanced industrialized countries. A similar body of work is beginning to emerge for transition countries. This present paper brings to bear this literature to provide guidance to policy makers and donor assistance providers in the transition economies. The existence of fine surveys of this literature (e.g., Schneider and Ernste 2000) obviates the need for a comprehensive review here. Instead, our approach is to illuminate the issues, provide updated and improved measures of the size and characteristics of shadow economies as they pertain to transition countries, and then draw out policy recommendations to address key questions. Primary among these are the following:

- Does a shadow economy (and through what mechanisms) prevent, merely slow down, or actually promote economic growth and competitiveness?
- What policy measures would be effective, ineffective, or even counter-productive in a shadow economy situation?
- What are the implications for donor assistance of the answers to the previous questions?

Addressing these broad but deep questions requires both the application of the existing literature and further statistical analysis to identify the economic, social, and political channels that link the shadow economy to government policy and to donor assistance, as well as to economic growth.

The paper considers several sets of linkages, each with multiple directions of causality. The first set concerns the impact of poor institutions and policy on the firm's decision to produce in the shadow economy. In the reverse direction of causality, it concerns the impact of the shadow economy on the quality and effectiveness of government policy and institutions – and especially those related to fiscal matters.

The second set concerns the impact of donor assistance and how it might affect the size of the shadow economy. In the reverse direction of causality, it concerns the impact of the shadow economy on the effectiveness and sustainability of development assistance and the choice of delivery vehicles.

The third set relates to the relationship between the shadow economy and economic recovery. Does a larger shadow economy speed up or delay recovery? Under what conditions is recovery accompanied by a continued increase or decrease in the shadow economy? Subtopics here concern the effect of a shadow economy on the degree and quality of competition as well as on its role as a social safety net (income distribution issues) during the transition period.

1.3   Paper organization

To address the above objectives, we organize our paper in the following way.

We start by presenting in Section 2 a definition and taxonomy of the various types of shadow economies. With this heuristic framework as a point of departure, we next describe the characteristics of the shadow economy in a transition country setting, underscoring the differences with the informal sectors in less developed countries and the hidden economies in the OECD.

In Section 3, after a brief review of existing measurement methods in the literature, we present our methods for measuring and characterizing the shadow economy in transition countries. We then discuss caveats regarding our methods.

We then present in Section 4 our estimations of the size of the shadow economy in each transition country using the methods of the previous section. These figures allow examining shadow economy activity over time and across transition countries.

Using these newly estimated measures of the shadow economy, we return to the original questions posed in the goals of the study. In Section 5, we consider the effects of the shadow economy and its implications for economic recovery and growth. We first discuss the costs and benefits from the shadow economy found in the literature. We then relate the shadow economy to various measures of economic performance on the one hand and factor accumulation, initial conditions, and institutional characteristics on the other. We then examine the nature of competition in an economy with a substantial shadow economy, including the dynamic aspects of

competition, on the country's capacity for innovation. We also consider international competitiveness.

With these linkages established between the shadow economy and economic growth and decline, we then consider the policy implications in Section 6. We first examine how government policies and projects are affected by the presence of a substantial shadow economy. We then propose recommendations for modifying policy. We then consider the implications for donor assistance. The section closes by proposing recommendations for foreign donors on how to modify the appropriate assistance package and its mode of delivery in a transition economy context.

2   Characterizing the shadow economy

2.1   Definitions in the literature

It is perhaps fitting for a topic whose substance is as murky as that of the shadow economy that there is not even agreement as to the name applied to this type of activity. Several alternative appellations exist for the phenomenon. The term "informal" has tended to refer to artisanal and very small-scale activities and is mostly associated with the so-called less developed country context. The term "hidden" and "underground" have tended to be associated with tax evasion. The terms "parallel, and "black" seem to be most associated with currency dealings. "Unofficial" and "unrecorded" activities seem to mostly refer to economic activities that escape the national statistics collection agencies. We have adopted the term "shadow" in the context of transition countries.

Perhaps because of the breadth of the subject, most papers that deal with the phenomenon remain vague as to the exact definition. Some papers simply give a list of shadow economy characteristics. Tanzi (1982) describes shadow activity as the tendency of people and firms to perform their economic activities without the intervention or cooperation of the state. As is often the case when multiple terms are used, the target of attention either is multifaceted or in fact refers to more than one entity (process, in this case). From the literature we can broadly identify several characteristics of shadow activities. These include activities that:

(a) Evade taxes (either as part of general fiscal collections or as specific service charges)

(b) Ignore currency requirements (e.g., local currency as the only legal tender)

(c) Avoid regulatory requirements (e.g., "licensing")

(d) Fail to appear in statistical reporting mechanisms

(e) Are *per se* illegal (e.g. drug dealing).

These characteristics form a typology with potentially thirty-two situations which would be candidates for a strict definition of "shadow." An examination of firms in the FSU/CEE[1] shows that they fall within a continuum of these characteristics. Note that while corruption is not explicitly on this list, it would often be the mechanism used to engage in many of the actions described.

Even such a typology does not remove all the confusion. For example, some regulatory restrictions can proscribe some activities that would be otherwise completely legal – and even

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[1] See abbreviations in page 9.

necessary – in a well functioning market economy. Examples are log export bans, trading foreign exchange, or other items or services for which the state has legislated itself a monopoly.

We may identify several reasons for the obscurity regarding the definition. First, any attempt to come up with a precise definition that concentrates on one particular aspect may seem too narrow to reflect all the various aspects of the phenomena. Second, such definitions can be arbitrary rather than represent an actual economic phenomenon (for instance, unrecorded activity depends on data collecting and estimation methods used by national statistical offices). Third, due to measurement difficulties, definitions are either method-specific or do not fit one particular definition. Fourth, different country groups tend to have different shadow economy characteristics that preoccupy their policymakers. The OECD countries are most concerned with tax evasion. Less developed countries tend to be most concerned with the effects of regulation and unwieldy tax systems on stifling household-level and small enterprise economic activity. In the least developed economies and in new states there is an emphasis on simply putting into place an internationally accepted national statistical reporting collection network.

For the present study the shadow economy is the value-added activities that the official statistics do not register, even though they should (according to the SNA methodology). We chose this definition because this is what our measurement method is equipped to capture, and not because we believe it to reflect the only relevant considerations for shadow activity.

2.2 The importance of studying the shadow economy

At this point it may be fair to ask why one needs to invent the classification "shadow." Isn't it enough simply to analyze tax evasion or the effect of avoiding regulatory compliance, for which an abundant literature exists?

First, while there are different causes providing firms an incentive to enter the shadow economy, once in the shadow their behavior is similar in many ways. There are analytic insights reached, therefore, by treating them as a group.

Second and more important, existing studies of particular causes, say tax evasion, tend to look at specific effects, say impacts on public finances. The implication tends to be that this single effect is the main story. By recognizing the shadow economy as a separate sector, we are led to ask a series of questions related to how being in the shadow economy changes a firm's economic behavior along *other* dimensions. Using the example of tax evasion, we show that firms who enter the shadow economy to avoid taxes tend to lose access to official channels of financing, reduce their capital intensity of production, and operate with shorter time horizons. These can have a profound effect on long-run economic growth. The linkage between bad tax administration and economic growth are seldom considered in the tax evasion literature, however. By focusing on the shadow economy *per se*, this link becomes both clear and relevant.

The effects described in the previous two paragraphs are further strengthened by noting that a firm's decision to enter the shadow economy is the cumulative effect of multiple causes, even if each one on its own is not onerous and could otherwise be overlooked.

Treating the shadow economy as a specific entity allows us to recognize the existence of several externalities that would otherwise be missed. For example, tax evasion as a response to wasteful government spending can lead to externalities such as a loss of trust or respect for government authority. This, then, may further reduce compliance in other areas of regulation. Furthermore, entering the shadow economy has many of the unintended consequences discussed

above, such as leading to misinformation-based policy failure from firms that have escaped the statistical collection net.

Finally, recognizing the broader consequences of the economic agent's decision to enter the shadow economy provides insights regarding the reverse decision, namely, returning to the official economy (or where *de novo* firm entry should occur *ab initio*). We return to this theme several times below.

In this paper, then, we focus on the consequences of the shadow economy *per se* rather than the impact of its individual causes, which are amply treated in the literature.

2.3   Causes of the shadow economy

Understanding the forces that lead to the shadow economy can help us towards finding the correct policy prescription to deal with it. Given the wealth of literature on the shadow economy, we begin with a description of the general causes leading to the phenomenon. We then examine the causal peculiarities of shadow activity in the transition country context.

2.3.1   The general case

The best way to approach the issue of the causes of the shadow economy is to analyze the incentives faced by economic agents (firms or individuals) making the decision whether to be official. For this we need to identify the costs and benefits of moving from the official to the shadow economy and vice versa – the directions are *not* symmetric. We do this by examining the potential benefits and costs to consider in the decision.

Among the benefits to entering the shadow economy, the most popular determinant mentioned in the literature is tax rates. The common theme is that high taxes (both marginal and total) have a negative impact on the decision of economic agents whether to operate officially. Nevertheless, though the influence of tax rates appears in most studies regardless of the countries analyzed, some researchers recently suggest that perhaps it is not the most important cause. In fact, Friedman *et al.* (1999) suggest that higher taxes are associated with *lower* shadow activity. This occurs because higher taxes afford higher quality public services, which, as we indicate below, attract firms into the official economy. It can also be the case that only a country that has good prospects for collection will raise its rates.[2]

Johnson, Kaufmann, and Shleifer (1997), Johnson, Kaufmann, and Zoido-Lobaton (1998), and Friedman *et al.* (1999) believe that institutional aspects are more important than taxes in promoting shadow economies. Institutional aspects, in this context, include the efficiency of administration, extent of control rights held by politicians and bureaucrats, bribery and corruption. They claim that the most important aspect is the enforcement of regulations. In Johnson, Kaufmann and Shleifer (1997), based on a theoretical model which is backed up with empirical evidence on transition countries, they predict that three variables are the causes of the shadow economy: the amount of regulation, the tax burden, and corruption. In their later cross-country studies that include LDC, transition, and OECD countries, Johnson, Kaufmann, and Zoido-Lobaton (1998) and Friedman *et al.* (1999), suggest that the key determinant of under-ground activity is not tax rates but rather the extent of regulatory discretion. When regulations are lax and rule of law is weak, bureaucrats are allowed to make decisions on individual cases

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[2] This would be an important finding were it true within a homogenous group of countries. We believe, however, that their result may simply reflect the fact that in the OECD countries taxes are high and shadow economies are small, relative to other countries.

without supervision. This creates corruption, which causes firms to become unofficial. A smaller unofficial sector is found in a country with a lower regulatory burden on enterprises, less corruption, better rule of law, and a more efficient and competent tax administration.

Additional regulatory causes were suggested in various studies. For LDC countries, trade restrictions was mentioned. For OECD countries, emphasis is on the increase in regulations and especially labor regulations such as a forced reduction of weekly working time, early retirement, and labor restrictions for foreigners. Schneider and Enste (2000) also mentions the social welfare system that discourages beneficiaries from working in the official economy, since by doing so they lose eligibility for some of the benefits.

Every regulation represents a fixed (transaction) cost for the firm. This fixed cost, therefore, imposes the heaviest burden on small firms. This fact alone should push a disproportionate share of small firms into the shadow economy.

Regarding the relationship between corruption and shadow activity, there is still no consensus in the literature. Are unofficial activity and corruption complements, since firms go underground to avoid corrupt officials or go underground by bribing officials? Or are the two substitutes, which will be the case if the official economy is a sanctuary from corruption? Recent empirical evidence suggests some complementarity: Johnson, Kaufmann, and Zoido-Lobaton (1998) find a significant positive relationship between bribery or corruption and shadow activity, as do Friedman *et al.* (1999) using eight different measures for corruption. This positive relationship may be due to the fact that both corruption and shadow activities may be caused by a third factor, e.g. a weak judiciary system.

While the above may be considered direct causes of shadow activity, they also can have an indirect effect if present over a long enough time period. In particular, the multiple types of institution failure mentioned above can lead to a decline in loyalty towards public institutions and a decline in tax morale.

Turning to the cost side, public services may be lost to an economic agent in the shadow economy. The primary loss is the use of the legal system (important as a support for contracts). The second is the receipt of police protection. The third, depending on the country, is social services, such as those related to health and pensions. This effect also depends on whether the economic agent is wholly in the shadow economy or operating in both shadow and official economies, as is often the case for larger firms in the transition countries.

Among the private sector services that may be lost to a firm in the shadow economy are those related to banking, capital markets, and nonfinancial (e.g., insurance) services. These losses stem from the unregistered nature of such firms, their reluctance to leave "paper trails," and the requirement by the service providers for some sort of legally binding collateral.

The discussion so far has identified the key causes in a static setting. Note, however, that the fact that at a particular moment the benefits of being official outweigh the costs does not imply that the economic agent will immediately become official. This decision must be analyzed in a dynamic context, where expectations about the future benefits and costs of remaining or moving back to the previous state may have a role. Moving between legal statuses incurs transaction costs. Such fixed costs are associated with the phenomenon of hysterisis.[3] Thus, for

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[3] This refers to the fact that in the presence of thresholds, the effect of small additional forces may be irreversible. For example, a slight increase in stretching applied to an already taut rubber band will break the band. The band does not recover even if the stretching force is then removed.

example, if the appearance of an additional inappropriate regulation pushes firms into the shadow economy, its removal may not cause the firms to return to the official economy.

Another way of interpreting these transaction costs is to view the movement between legal statuses as having "entry barriers." For example, the requirement to pay all back taxes or noncompliance penalties would be an entry barrier to a firm contemplating a movement into the official economy. The "height" of such barriers is often affected by public policy, an example being a tax amnesty.[4] There are two primary entry barriers of concern, the one related to movement out of the official economy and the one related to movement into the official economy. These dynamic considerations are taken up in our discussions in subsections 5.4 and 0 when we deal with competition issues in particular and policy analysis in general.

2.3.2 Transition countries idiosyncrasies

Though there are similarities between shadow economies in OECD, LDC, and transition countries, one should be cautious before applying lessons from one set of countries to the other. The shadow in the OECD countries is usually attributed to high taxation and onerous labor regulation. In the LDC, the driving forces are usually tax and regulation avoidance, corruption, and general distrust of citizens towards the political system. All the aspects mentioned above are relevant to the transition countries as well, yet, in the case of transition, there are additional unique dimensions. These include the communist heritage, the transition from a command to a market economy, the dramatic structural change of industry and of government in a short period of time, and the process of quick and massive privatization. Moreover, several of the transition economies are new states[5] with little experience in "growing" the institutions of government. These features affect all aspects of the shadow economy, including its characteristics, its impacts, the possibility for its measurement, and the type of public policy prescriptions.

Kaufmann and Kaliberda (1996) discuss characteristics specific to transition countries, highlighting the following aspects. First, in transition economies the state sector takes part in unofficial activities, and even the large state enterprises participate in both official and unofficial activities (which are often identical except for accounting and bookkeeping purposes). Such behavior allows more flexibility for state officials and managers and allows them to extract private incomes from state firms. Kaufmann and Kaliberda mention that there are complex bridging channels between government agencies, state enterprises, and nonstate unofficial activities. Second, unofficial activities are sometimes big and visible, which is due partly to the characteristic mentioned above. This is perhaps a departure from the traditional view of shadow as comprising rural or household activities. Third, unofficial activity is mostly nonviolent and noncriminal, having become unofficial mostly to avoid the burden of administrative regulations and taxation. Fourth, Kaufman, and Kaliberda note that there is a continuum in the official/unofficial spectrum; most activities operate in both. Unlike perhaps Latin America there is no sharp dichotomy. Fifth, operating in the shadow economy does not cut the firm off from its accessibility to social services and state subsidies. The fact that all activities are within the social safety net can be attributed to the socialist legacy and to the presence of mixed shadow/nonshadow entities. Sixth, the unofficial economies in transition countries are shallow

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[4] As many countries have discovered, an amnesties can often be a two-edged sword. Amnesties may lower barriers into the official economy but they also can lower the barriers into the shadow economy by leading to the expectation that they might be repeated in the future.

[5] This may be a source of similarity of the shadow in some transition countries and in countries in Africa.

relative to other regions of the world; that is, they are particularly sensitive to economic incentives from governments. (The exception to this rule is activities that are *per se* illegal). EBRD (1996;73) speculates that, unlike in other regions, this is because much of the unofficial economic output in transition economies comes from misreported or undeclared production of registered firms, something that is quite responsive to relative cost differences (caused by such government actions as taxation and regulatory burden) between the shadow and official economies. Finally, shadow activities in transition countries use barter and foreign exchange as main means of exchange. This is in contrast to OECD countries where shadow transactions are usually done in local currency cash.

Kaufmann and Kaliberda (1996) conducted a micro survey for the Ukraine in 1994 to investigate the various elements of the shadow economy in transition countries. Though their research was for a single country, their results are suggestive of features relevant to other transition countries. They find that small enterprises had to spend huge amounts of money, on average about $2000 a year, in unofficial payments to evade licensing and permits requirements. In Kyiv, this average for small-to-medium enterprises was about $12,000. Many firms also paid considerable amounts to intermediaries who helped solve administrative difficulties. Small-to-medium firms also paid $1,200 in "protection" fees.[6] As to the question regarding the main factors for being unofficial, the popular answers were regulations in foreign exchange and trade regimes, high inflation, high tax rates, and volatile and retroactive tax regulations. There was less emphasis on labor regulations, enterprise registration, or infrastructure constraints. The result of the survey implies that the main factors affecting decisions of entrepreneurs in transition economies as to whether to be official or nonofficial are:

- political liberalization vs. repression,
- development of rule-of-law and related institutional enforcement mechanisms,
- the degree of administrative controls vs. economic liberalization of the official economy (including foreign exchange, trade and pricing regimes, and deregulation at the firm level),
- the official tax burden (including high taxes, multiple taxation, and constantly changing tax regimes), and
- macroeconomic instability, which induces flight to foreign currency, capital flight, and barter transactions and makes it harder to keep track of firms' accounts.

3   Measuring the shadow economy

Turning to measurement, we begin by reviewing the existing methods in the literature and evaluating their strengths, weaknesses, and suitability for use in a transition economy context. Building on existing approaches we then present our methodologies. We first enhance a method based on total electricity consumption to create a first iteration indicator of total shadow economy activity for the years 1990 to 1997. We then use the 1997 value as an indicator in a shadow economy model based on the causes of such activities, as described in the previous section. The section ends with important caveats regarding the interpretation of our results.

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[6] Frye (1997) suggests, however, that some activities actively avoid public protection mechanisms such as the court system not due to the poor quality of the courts, but because of their desire not to reveal information about their activity.

3.1   An evaluation of existing methods

Over the years, researchers of the shadow economy have acknowledged the big difficulties in its measurement, which is not surprising since shadow activity, by definition, is activity that attempts to avoid detection. Some scholars went as far as to describe the entire effort as pointless (Thomas 1999). While their concerns were raised regarding work in the stable economies of the OECD, the difficulties are further amplified in the context of the chaotic period faced by the countries of transition. Moreover, while numerous methods have been used over the years to quantify the size of the shadow economy, methods developed for the OECD or LDC cases may not be suitable for a transition economy. A proper measure of the shadow in transition should take into account these countries' idiosyncrasies as well as the limitations of each method. For this reason, prior to presenting our methods, we examine briefly the strengths and weaknesses of the different methods in the literature. Following Schneider and Enste (2000) these methods can be categorized into two types: direct methods and indirect methods.

3.1.1   Direct methods

These are methods that try to detect directly the economic agents operating in the shadow, rather than indirect signs of shadow activity.

Micro surveys. Because of their ability to provide detailed information about the structure of the shadow economy and the socioeconomic motivations related to the decision to enter the shadow economy, micro surveys offer a potentially powerful opportunity to understand the nature of the problem. A well implemented survey presents two challenges. First, the need to adequately sample all the potential segments of a shadow economy means that the costs may be prohibitive. Moreover, if the method focuses only on households, then it would then need to be augmented by firm-level surveys. Second, surveys always risk suffering from a lack of trust, which may cause people to report incorrect information. This is especially true in so sensitive an issue as shadow economy participation. Thus, micro surveys may provide an extreme lower bound to shadow activity.

Tax audits. This method audits taxpayer returns and, in some cases, uses additional sources (e.g., electricity customer lists) to identify tax evaders. If sampling is done well, the tax administration can then use the compliance rates to estimate the shadow for the economy as a whole. The method can work well for determining the degree of revenue shortfall and for designing a cost-effective tax compliance program. However, this method may not discover activities of unregistered economic units. Lack of efficient tax administration and corruption – causes of the shadow economy in the first place – also tend to make this method less effective. Finally, to the extent that the shadow economy is defined to be more than tax evasion, this method will misstate the shadow economy's size.

3.1.2   Indirect methods

Indirect methods usually try to measure total economic activity by searching for variables that are correlated with it, comparing the results to official GDP measures, and then attributing the gaps between the two to the shadow economy. These methods are best at providing good measures for changes in total economic activity and, therefore, also can help detect trends in the size of the shadow economy over time.

Yet the usefulness of indirect methods for discovering the actual size of the shadow economy in transition countries is much less clear. The problem in this case is, first, the fact that

these methods, as discussed below, always require the assumption of a benchmark year in which the shadow size is known prior to the measurement attempt. Second, the estimators obtained do not always correspond clearly to a precise definition of shadow activity, since they cannot distinguish between activities that are supposed to be included in the GDP measures and activities that are not (e.g., household production). They also depend critically on whether the GDP measurement methods used by national statistics offices already include estimations of unreported activity.

Currency demand. Developed first by Cagan (1958), this method attempts to estimate a demand for currency function on the assumption that changes in demand that are not linked to changes in official GDP must reflect changes in shadow economy activity. It needs to assume that the income velocity is the same for currency used in the shadow economy as for legal activities. This method requires a fairly stable, or at least predictable, demand for currency, something that is not likely to be the case during transition when the banking and financial sectors are undergoing profound restructuring and inflation volatility (as well as unstable inflationary expectations) prevail. Moreover, unlike the informal sectors in other regions, the shadow economy in many transition countries tends to use foreign currency and barter rather than local currency. Furthermore, due to the complexity of the changes during transition, it may be difficult to determine the full, relevant set of causal explanatory variables to use as controls. Finally in transition the assumptions of a same velocity of money in both shadow and official economies as well as the assumption that a base year exists with no shadow activities are unfounded.

Transaction approach. Developed by Feige (1989 and 1996), it assumes a constant relation over time between the volume of transactions and official GNP, and then uses Irving Fischer's quantity equation, $M*V=P*T$ (where T is total transactions, M is currency, V is the velocity of money and P stands for the price level). The approach also requires assumptions on the velocity of money and on the relationship between $P*T$ and total (official and nonofficial) nominal GNP. The approach has to assume a base year with no shadow, in which ratio of $P*T$ to total GNP was "normal". Clearly, in the case of transition economies the assumption of a base year and a time-invariant ratio of transactions are too strong to be realistic. Also, the need for estimates of the volume of transactions is problematic.

Total electricity use. Pioneered by Kaufman and Kaliberda in transition economies, the method measures overall economic activity by assuming that electric power consumption and total (official and unofficial) GDP move together so that the ratio of GDP to electricity consumption is constant. Under such assumptions, the growth of total electricity consumption reflects growth in total GDP. After the growth in total GDP is found, the difference between the growth rate of registered GDP and the growth rate of total GDP is attributed to the growth in the shadow economy. The strength of this method is that it is very simple and inexpensive to implement.

As the method has been applied to date, however, its weaknesses are many. First, not all shadow activities use energy, and electricity in particular. Second, technical progress that changes the efficiency of use of energy may change the GDP/energy ratio across time and countries.[7] So can many other factors such as changes in industrialization, efficiency changes in the industry, and changes in energy prices. These problems become particularly manifest during

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[7] We should point out that in Johnson, Kaufmann, and Shleifer (1997) try to make a rough adjustment for this possibility.

transition when the share of industry typically contracts profoundly and the share of non-energy-intensive agriculture expands. In addition, liberalization of the energy market could cause big changes in the pattern of energy and electricity use. Finally, the massive modernization efforts associated with transition will undoubtedly increase the energy efficiency of output.

Household electricity use. Developed by Lacko (1996), the method estimates the shadow economy associated with the household consumption of electricity (in the spirit of Kaufmann and Kaliberda) and then assumes that the shadow associated with household activity is highly correlated with total shadow activity in the economy. The method then uses two equations, one for electricity consumption as a function of some of its possible determinants (one of which is the size of the shadow economy) and the second for the shadow size as a function of taxes and social welfare expenditures. Solving the two equations provides an estimate for the relation between electricity and shadow in these countries. To get the actual size of the shadow economy, an estimate of GDP per unit of electricity in each country is necessary. Since these figures are not known for the transition countries that Lacko investigates, Lacko uses results from the United States.

The virtue of this method is that it takes advantage of an additional source of data in a region where data are scarce and that it is not too costly or difficult to implement. On the other hand, since a large chunk of the unofficial economy takes place within medium and large firms, this method is only good at estimating that portion of shadow activity carried out by households. Unless there is a predictable relationship between household and firm shadow activity, this method may not be appropriate. Also, as in the case of the total electricity method, a normalization is necessary (Lacko uses U.S. electricity consumption figures, which may not be appropriate). Beyond the limitations mentioned above, the Lacko approach seems to suffer from serious technical problems. First, in the causes equation the explanatory variable Lacko uses is shadow activity *per capita,* even though it seems that the cause variables should rather explain shadow *per unit GDP*. This can lead to a huge bias in favor of wealthy countries.[8] A second problem is the use of output decline as a cause variable. Even if it is a valid cause for shadow, the fact that it also can be directly related to electricity use can result in a bias.

3.1.3   Other methods

Labor approach. This method seeks to use information about discrepancies between official and actual labor force participation rates to deduce changes in shadow activity. A decrease in the official rate of participation can be seen as an indicator for an increase in the activities in the shadow. This method is probably ineffective in a transition economy context. First, the method assumes that labor participation is constant, highly unlikely in the draconian context of the contracting economies of transition. Second, since much of the shadow activities is done in firms that participate in both official and unofficial activity, if all the workers of such firms are considered officially employed the method will seriously underestimate shadow activity. Third, large structural changes may imply a big change in the unemployment rate that is not attributed to a movement to the shadow economy. Fourth, many people take part in both official and unofficial activities in that they have a job in the official economy and also a second, unrelated job in the shadow economy. Fifth, it is unclear if people working in the shadow are registered as

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[8] One can show by a numerical example that even if two countries have identical cause values and the same shadow/GDP, if one is wealthier and uses more electricity proportionally it will receive lower shadow values according to the Lacko method.

being part of the labor force. Sixth, there can be other explanations for differences in official and true labor participation rates, such as an increase in poverty, which increases labor force participation. Finally, the data on the labor force may be unreliable.

National expenditures and income statistics discrepancy method.[9] This method is based on the national accounts identity which requires the value of expenditures on final goods to equal the accumulated value-added of factor payments (incomes) paid in all the intermediate stages of goods and services leading to the production of the final goods. Differences in these two sums are attributed, according to this method, to shadow economy activity. Clearly the need to have direct and independent estimates of each side of the accounts – something seldom available in transition countries – is a serious drawback for this approach. Moreover, the method cannot always rely on national statistics, since country statisticians explicitly try to close this gap. Omissions and errors in national accounting also may distort this gap.

Model method. The model approach (Weck 1983) considers multiple causes and multiple effects of the shadow economy. The approach is based on the statistical theory of unobserved variables. It assumes that the shadow economy is an unobserved, "latent" variable that appears in two equations, first as the dependent variable in the "causes" equation and second as an explanatory variable in an "effects" equation. Using these two equations and appropriate standardizations, the latent variable is recovered by searching for the series of numbers that are most likely to generate both the observed causes and the observed effects.

This method has the advantage that it makes use of several indicators (effects) that capture the presence of shadow economy activity, unlike other indirect methods that force a single indicator to exclusively capture the shadow size. The model method also makes use of several causes, whereas other methods usually do not use causes at all or use a single cause (e.g., the burden of taxation). Similarly, by using many dimensions of the existing data that can convey a signal of the shadow economy's existence, it makes an attempt to overcome the inherent poor quality of data that confront researchers in the field of transition. Finally, the method generates estimates with known statistical properties, is rather inexpensive and straightforward to implement, and produces results that are amenable to cross-country comparisons. On the other hand, interpreting the results is not a straightforward task since the resulting series does not easily correspond to a clear definition of shadow activity. As is often the case with latent variable approaches, the estimates are sensitive to the proxies one uses as cause variables. Finally, the method also suffers from the same problems as other methods that require base-year knowledge of the size of the shadow economy and standardization.

3.2   The modified total-electricity-based (MTE) approach, 1990-1997

While each of the methods presented above has its strengths, none as previously implemented is ideal for our present purposes. In this section, we present the "recipe" for constructing the shadow indicator using the MTE method. This method corrects the most glaring faults of the total electricity use method above by accounting for changes in other factors (e.g., prices, output composition, and efficiency). It then relates the residual, unexplained changes in electricity to changes in the shadow economy.

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[9] This method is discussed in detail in Thomas (1992) and Yoo *et al*. (1998).

The data used. We use electricity consumption data for the years 1990-1997 obtained from EBRD (1999). From this data we calculate the actual annual percentage change in electricity consumption for each country (ΔElec).

Filtering. To check whether there are additional factors besides changes in total economic activity that could explain changes in electricity use, we regress ΔElec for the years 1994-1997 against several alternative influence variables. These include demand changes due to ΔEprice (percentage change in electricity prices) to capture price changes, ΔIndGdp (percentage point change of industry share of GDP) to capture changes in the structure of output, and ΔPrvGdp (percentage point change of share of private sector in GDP) to capture changes in efficiency in electricity use from privatization and modernization.[10]. Using 47 panel observations for the period 1994-1997 the regression yielded (t-statistics in parentheses)

$$\Delta Elec \;=\; 0.032 - 0.25*\Delta Eprice + 0.05*\Delta IndGdp \;\; - 0.0018*\Delta PrvGdp + \varepsilon$$

$$\text{(3.25)} \quad \text{(-2.79)} \qquad\qquad \text{(2.46)} \qquad\qquad \text{(-1.62)} \qquad\qquad \text{Adj. } R^2\text{=0.26}$$

The significance of these coefficients proves that failing to take these additional factors into account may result in a systematic bias. The next stage is therefore to remove the influence of (filter out) these factors. This is done by using the coefficients obtained from the regression above and by creating the following variable:

$$\Delta Elec^{resid} \;=\; \Delta Elec - 0.25*\Delta Eprice - 0.05*\Delta IndGdp - 0.0018*\Delta PrvGdp$$

The variable $\Delta Elec^{resid}$ represents the residual change in electricity use that could not be accounted for by other factors, as proxied by our three variables (or in other words: the estimated change in electricity use if the other factors were to stay constant). Unfortunately, this variable could only be created for the years 1994-1997 since we could not obtain data for electricity prices for earlier years.

Obtaining a TEA (total economic activity) series. First, to compute the predicted percentage changes in TEA (ΔTEA) we multiply the ΔElec and $\Delta Elec^{resid}$ values by an appropriate output elasticity of electricity (η). For the years 1990-1994, we follow Johnson, Kaufmann and Zoido-Lobaton (1998) and assume elasticities of 0.9 for non-FSU countries, 1 for the Baltic countries and 0.9 for other FSU countries. For the years 1995-1997 we use instead a constant elasticity for all clusters of 1, since our filtered series, $\Delta Elec^{resid}$, already makes the adjustments that Johnson *et al.* were compensating for using their alternative, *ad hoc* elasticities. Then, we convert the results to a decimal by dividing them by 100 and adding 1. Finally, we use the converted figures to compute the TEA series (relative to its 1990 value) by chain-multiplication. Thus,

$$\text{TEA90}(t) \;=\; \text{TEA90}(t\text{-}1)* [1+\eta*\Delta E(t)/100] \qquad , \; t=[1991,1997]$$

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[10] These regressions include only those observations for which the annual change in electricity was less than 10 percent. We do this so as not to distort the results by extreme values for which the quality of the data is doubtful.

where TEA90(t)=TEA(t)/TEA(90) and $\Delta E(t)$ represents either $\Delta Elec(t)$ or $\Delta Elec^{resid}(t)$, depending on the year. (Note that by definition TEA90(1990)=100.)

   Obtaining a shadow series. Using simple algebra and the additional series, official GDP relative to its 1990 value (GDP90) and shadow size in 1990 relative to GDP (MTE(1990)), we can calculate the shadow economy size in the later years from

$$\text{MTE}(t) \;=\; [\text{TEA90}(t)/\text{GDP90}(t)] * [1+\text{MTE}(1990)] * 100 \;-\; 100 \qquad, \; t=[1991, 1997]$$

GDP90 is computed from growth rates taken from EBRD(1999) and we use the Johnson, Kaufmann, and Zoido-Lobaton (1998) figures for MTE(1990). The latter's figures are based on various studies, updated for 1990 using the electricity method.

   Despite the many caveats discussed below, we believe that calculating changes in electricity that cannot be attributed to changes in official GDP or other factors can provide a strong signal of the existence of shadow activities. Since this signal obviously contains some noise, no single number should be treated too literally.

3.3   The SIMC approach, 1997

The latent variable model approach we next use is a variation of the MIMC (multiple indicators, multiple causes) approach which we call the SIMC method ("S" replaces the "M" before "I" in "MIMC" to denote the fact that we use a single indicator). This method does not measure the size of the shadow economy directly, but rather estimates the extent to which a country has a potential for shadow activity, based on a fixed set of characteristics. We use it to develop alternative indicators for the year 1997. The idea is to find cause variables and effect variables that can only be related to each other through the size of the shadow economy. The size of the shadow economy is treated as a latent variable, and it is calculated by searching for the figures that can best explain the correlation between the causes and the effects. The appropriate choice of causes and indicators should reflect the special elements of transition economies. An example of a cause that was used for other countries and that may not be appropriate for transition is the social safety net, since in transition countries even unofficial labor had access to the safety net.

   Choosing indicator variables. The task of selecting indicators is especially difficult in the transition environment for two main reasons. First, many candidate indicators may be extremely noisy in this period. For instance, unemployment in transition can be influenced by many factors other than the shadow economy. Poor data collection can add additional noise. Second, many indicators during transition can be related to most cause variables for other reasons other than the shadow. For instance, if we use changes in the use of money as an indicator and price liberalization as a cause, we have no guarantee that their relation passes only through the shadow size. Due to these difficulties, we decided to use a single indicator: our MTE figure averaged over 1996 and 1997. We believe unexplained electricity can qualify as an indicator since it contains a strong signal for the shadow, and since it was obtained by "cleaning" the electricity data of elements that are not related directly to the shadow. We use an average of 1996 and 1997 to reduce the noisiness of the data. We also drop the observations for Turkmenistan, Uzbekistan and Estonia in the estimation since we have reason to believe that the MTE method did not work well for these countries. Our indicator equation is, therefore,

$$\text{MTE} = c + d*\text{INDSH} + e$$

where MTE is Shadow/GDP for 1996 and 1997 (averaged) using the MTE method, INDSH is the SIMC (latent variable) indicator of the shadow's size, and e is the error term.

Choosing cause variables. Here we look for variables that we believe cause the shadow economy but are not correlated with changes in electricity for reasons other than due to shadow activity. We chose two alternative variables.

PrinComp is the score obtained from the first principal component of three variables: the Sachs, Zinnes, and Eilat (2000b) rule of law indicator, the social security collection ratio (EBRD) and the electricity tariff collection ratio (EBRD). Each of these has a positive load on the score variable. The first principal component represents the ability of the government to exercise its fiscal control over the economy. The score is normalized between 0 (least control) and 1 (most control).

We create CorReg by multiplying the corruption indicator (Freedom House) by the regulatory burden indicator (Heritage Foundation). This variables scores between 0 (high corruption, high regulatory burden) and 1 (low corruption, low regulatory burden). The idea behind this indicator is that a low score is reached if both regulation and corruption are high – they have a strong reinforcement effect. This follows the idea expressed in the literature (e.g., Johnson Kaufmann, and Zoido-Lobatón. 1998) that shadow activities mainly try to avoid corruption of the public administration in countries that are highly regulated.

Due to the small sample (21 observations) and multicolinearity problems, we were not able to include both cause variables together in the regression. We therefore used each one independently to obtain shadow estimates, and afterwards averaged the results. Thus, the causes equation is

$$\text{INDSH} = a + b*X + v$$

where X is the cause variable, a and b are parameters to be estimated, and v is the error term.

Estimating the regression. We now view INDSH as a latent variable, and plug the causes equation into the effects equation. This gives us the following specification:

$$
\begin{aligned}
\text{MTE} &= c + d(a + b*X + v) + e \\
&= (c + d*a) + d*b*X + (d*v + e) \\
&= f + g*X + u
\end{aligned}
$$

where f and g are the composite coefficients to be estimated and u is the error term. We estimate this regressions using ordinary least squares. Both the cause variables turned out to be significant (at 95 percent confidence). With u_{pc} and u_{cr} the respective error terms, the results of these regressions for our two sets of variables are

$$\text{MTE} = 117 - 100*\text{PrinComp} + u_{pc},$$

that is, a country that scores perfectly will have a shadow of 17 percent of the GDP, and a country that scores the worst will have a shadow of 117 percent of GDP; and

$$MTE = 140 - 130*Cor*Reg + u_{cr},$$

that is, a country that scores perfectly will have a shadow of 10 percent of GDP, and a country that scores the worst will have a shadow of 140 percent of GDP.

Since the independent variables in the above regressions are themselves estimates of shadow size, we can use their predicted values to get direct estimates of the shadow economy. These estimates will have an average that is equal to the average of the MTE figures.

SIMC series. Averaging the predicted values across both cause regressions gives us the SIMC prediction we feel best reflects the size of the shadow economy for the years 1996-1997.

In closing, the SIMC approach may provide us with our best guess of a country's potential for shadow activity, given where it stands on several issues that cause it.

3.4   Caveats

While our methodology provides a powerful tool to learn about a very problematic policy issue, it also has a number of limitations that must be kept in mind so as not to misinterpret the results.

MTE approach. For this method, the following caveats should be kept in mind:
- Our approach does not strictly measure those economic activities that are missing from official GDP. Instead, our estimates capture all economic activities, including, for example, household activities[11].
- We have assumed that no country's official GDP figures include any attempts to include shadow activity in their reported numbers. We have reason to believe that this may not be the case for some countries, and especially the more advanced transition countries.[12] This "double" correction means that for some countries our shadow estimates may be biased downward.
- Data on electricity may be unreliable.
- We do not correct for other factors that affect electricity use (such as the increased use of home appliances since the start of transition)[13].
- For the years 1990-94 we use crude elasticities and, due to lack of data, we cannot do the corrections that we do for later years.
- The accuracy of the Kaufman *et al.*(1996) base year shadow activity estimates is unknown.

The SIMC approach. For this method, the following caveats should be kept in mind:
- Since, by construction, the average of the SIMC estimates is equal to the average of the MTE estimates, if the latter suffer from systematic biases due to the reasons mentioned above, so do the former.

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[11] The household sector can carry out activities that, while by convention are not to be included in official GDP, have by some estimates a value of up to 30 percent of official GDP (Frey *et al.* 2000; 2).

[12] UNDP(1999) presents a list of ten countries that make such corrections. Kaufmann and Kaliberda (1996; 93) also indicate this may not be the case in general.

[13] However, we did find that there was little movement to other sources of energy over the period.

- The estimates are of limited use for further analysis. The reason is that if follow-up analysis finds a correlation between a certain variable, say *A,* and the SIMC shadow value, it may simply be a result of a correlation between *A* and the original cause variables used in the SIMC procedure. As such, it would be hard to prove that the shadow size is actually the driving force for this correlation.
- In the SIMC method we were only able to use a limited set of variables that represent general causes for all countries. Unlike the physical input method, if a country has a large shadow economy because of unique reasons, it will not be captured by this method.
- There is no guarantee that the correlation between the causes and the indicator used in the SIMC approach necessarily passes through the size of the shadow. If other factors can explain these correlations, these factors can be mistakenly attributed to the shadow.
- The use of a single indicator may increase the noisiness of the results.
- The shadow size is restricted to be a linear combination of a small set of variables.

4   Cross-country and cross-study comparisons of the new estimates

In this section we present the measures of the shadow economy that result from the application of the methodologies described in the previous section. We then compare them to other measures of the shadow economy in transition countries found in the literature. We conclude by comparing the size of the shadow economy in transition countries (based on our new measures) to its size in other regions of the world.

4.1   The new estimates

Let us look at the shadow economy estimates that result first from the MTE and then from the SIMC approaches as described in Section 3.

4.1.1   Estimates based on the modified total electricity (MTE) method

Applying the modified total electricity method as described in Section 3.2 yields the measures provided in Table 1 of the shadow economy's size relative to official GDP. We also graph these estimates in Figure 1. Because of the noise in the data – we do not believe that the shadow economy's size changes so quickly – we include both the unsmoothed and moving average [14] series in the figures, with the latter given by the solid lines. As discussed in section 3.4, limitations in data availability allowed us to apply our MTE method only from 1994 onward. For earlier years we apply the original total electricity approach to our electricity series, creating a possible discontinuity in our estimates. We represent this break in the graphs by a vertical line at 1994.

A second way of presenting the relative importance of the shadow economy is to compare the official GDP with the estimates of TEA as implied by our estimates of the shadow economy. This is shown in Figure 2, where the gap between the official GDP curve (smooth line) and the total economic activity curve (line with circles) represents the shadow economy.

While we will be analyzing the implications of the size and changes of the shadow economy in the following sections, it is instructive to note some of the major tendencies. First, by later in the decade, there is clearly great variation in the size of the shadow economy relative to official GDP across countries – much more so than at the start of transition. Second, while

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[14] The moving average in year *t* is the average of the unsmoothed values in years *t* and *t*-1.

most countries' shadow economies increased over the decade, many have been able to stabilize or even reverse the trend. This is especially encouraging in the Caucasus where the first half of the decade witnesses rapid growth in the shadow economies. Poland, Ukraine and Uzbekistan offer three polar cases. Poland shows a secular decline over the decade while Ukraine indicates a secular increase (no sign of peaking). Belarus shows a small and constant shadow economy, but this might be a result of data problems for this country rather than an interesting economical observation. Finally, while we observe official GDP and the shadow economy moving either in the same or in opposite directions and we sometimes observe GDP falling when TEA is rising, we do not observe cases with GDP rising and TEA falling.

As illustrated in Figure 3 and Figure 4, different patterns emerge for countries with different initial conditions, as captured by the initial conditions cluster typology of Sachs, Zinnes, and Eilat (2000a). Here we see that the trends mentioned at the country level are borne out at the cluster level. The striking surprise here is the Balkans, which appears to have a shadow economy growing out of control. Note, however, that while this may be so, it is also the region with the strongest growth of TEA. In the Baltics, we see that official GDP growth may be misleading, as the region's TEA is stagnant.

Finally, while not explicitly shown in the figures, some general statements can be inferred from contrasting the Central and Eastern Europe (CEE) and Former Soviet Union (FSU) countries as distinct groups. First, the shadow size increases over time for both groups. Yet, there were big differences in the growth pattern: At the start of transition, CEE countries had larger shares of unofficial activity than the FSU. By the mid-1990s the pattern is reversed as a result of a sharp increase of shadow activity in the FSU, while in the CEE it rose only slightly.

4.1.2   SIMC estimates

Applying the SIMC method as described in Section 3.3 yields the measures provided in Table 2 of the size of the shadow economy relative to official GDP for the year 1997. The table shows the SIMC estimates for each set of causes, their average across sets, and the MTE estimate for comparison purposes. Finally, the country ranks (with 1 being the best, i.e., lowest shadow economy share relative to GDP) under the SIMC and MTE methods.

While we consider the analytic implications of these results in the next section, a number of tendencies are evident. First, the values of the shadow economy relative to GDP are quite similar under both SIMC cause sets. Second, the country scores appear to be highly related to most indicators of country progress: Slovenia, Poland, Estonia, and the Czech Republic have the lowest shadow economy presence while the Central Asian countries have the highest.

Table 1: The shadow economy's size relative to official GDP in transition countries using the MTE approach, 1990-1997.

Country	*Original total electricity approach*					*(New) MTE approach*		
	1990	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*	*1997*
Armenia	31	50	143	108	80	74	93	65
Azerbaijan	28	22	16	52	79	103	101	99
Belarus	18	21	20	18	23	28	20	15
Bulgaria	34	34	34	34	32	44	70	*
Croatia	30	39	28	36	34	31	27	44
Czech Republic	7	18	18	23	24	24	25	23
Estonia	25	34	33	45	66	75	78	71
Georgia	33	45	112	153	116	126	105	87
Hungary	37	43	36	38	34	38	41	37
Kazakhstan	20	35	32	41	30	46	33	27
Kyrgyz Rep.	20	30	53	91	142	261	199	180
Latvia	15	21	49	40	35	38	39	*
Lithuania	13	19	23	36	43	38	11	*
Macedonia	30	44	48	75	89	108	128	135
Moldova	22	45	88	41	130	127	140	*
Poland	24	30	23	21	17	15	13	*
Romania	29	21	24	19	11	12	15	24
Russia	17	18	30	35	45	53	54	52
Slovakia	6	15	14	19	16	11	18	*
Slovenia	30	35	33	30	33	35	34	*
Tajikistan	20	20	61	70	105	111	137	91
Turkmenistan	20	25	-7	-3	2	22	25	*
Ukraine	19	23	34	46	71	96	115	128
Uzbekistan	13	10	5	0	12	6	15	11

Sources: Official GDP comes from EBRD (1999).

*While we had estimates for these countries in 1997, the underlying electricity data were too provisional to yield useful estimates and we have thus not reported the results.

Figure 1: Trends in the shadow economy's size relative to official GDP, using the MTE method, transition countries, 1990-1997.

The EU Border States
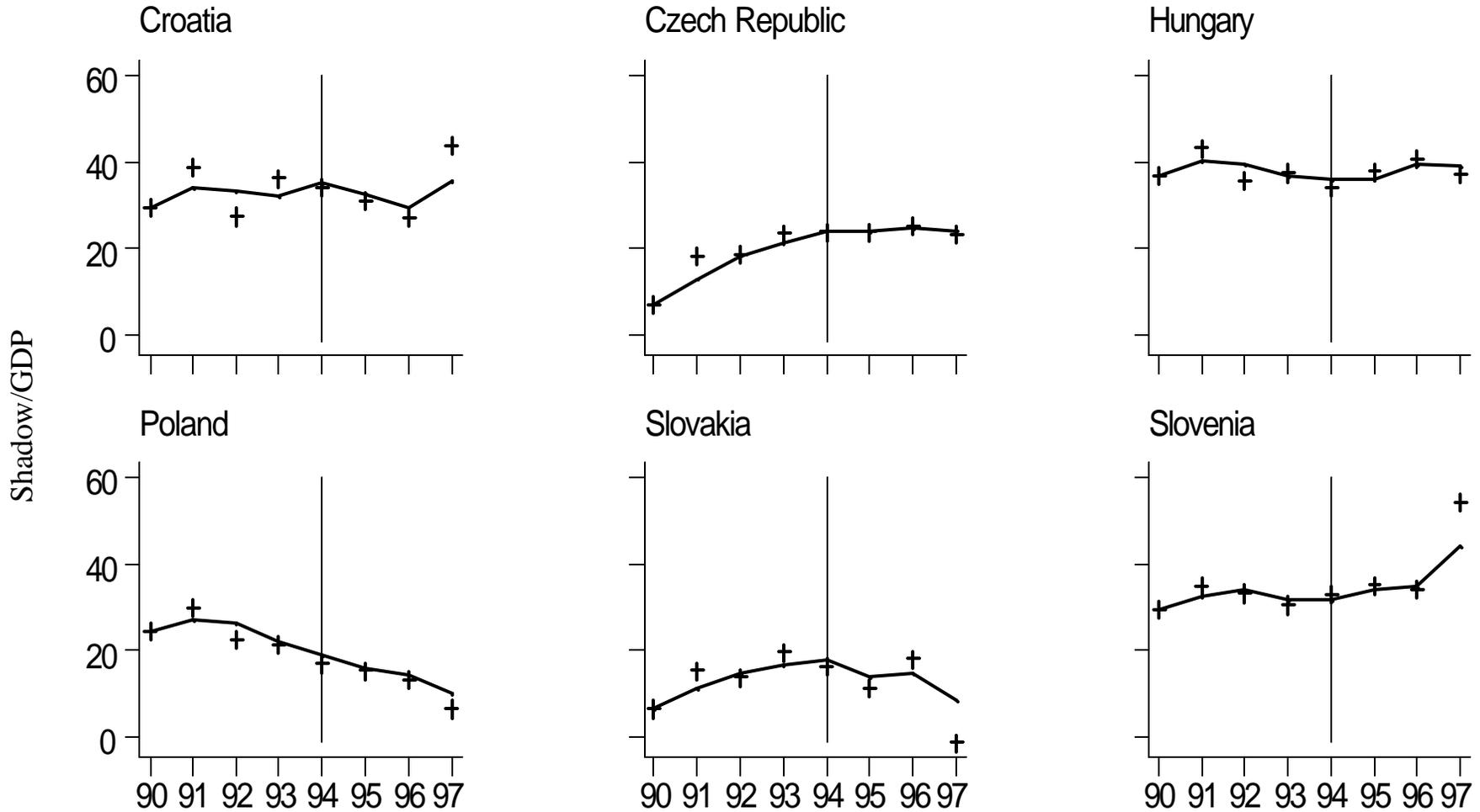
Notes and source: See end of table.

Figure 1: Trends in the shadow economy's size relative to official GDP, using the MTE method, transition countries, 1990-1997. (continued)

The Balkans

The Baltics
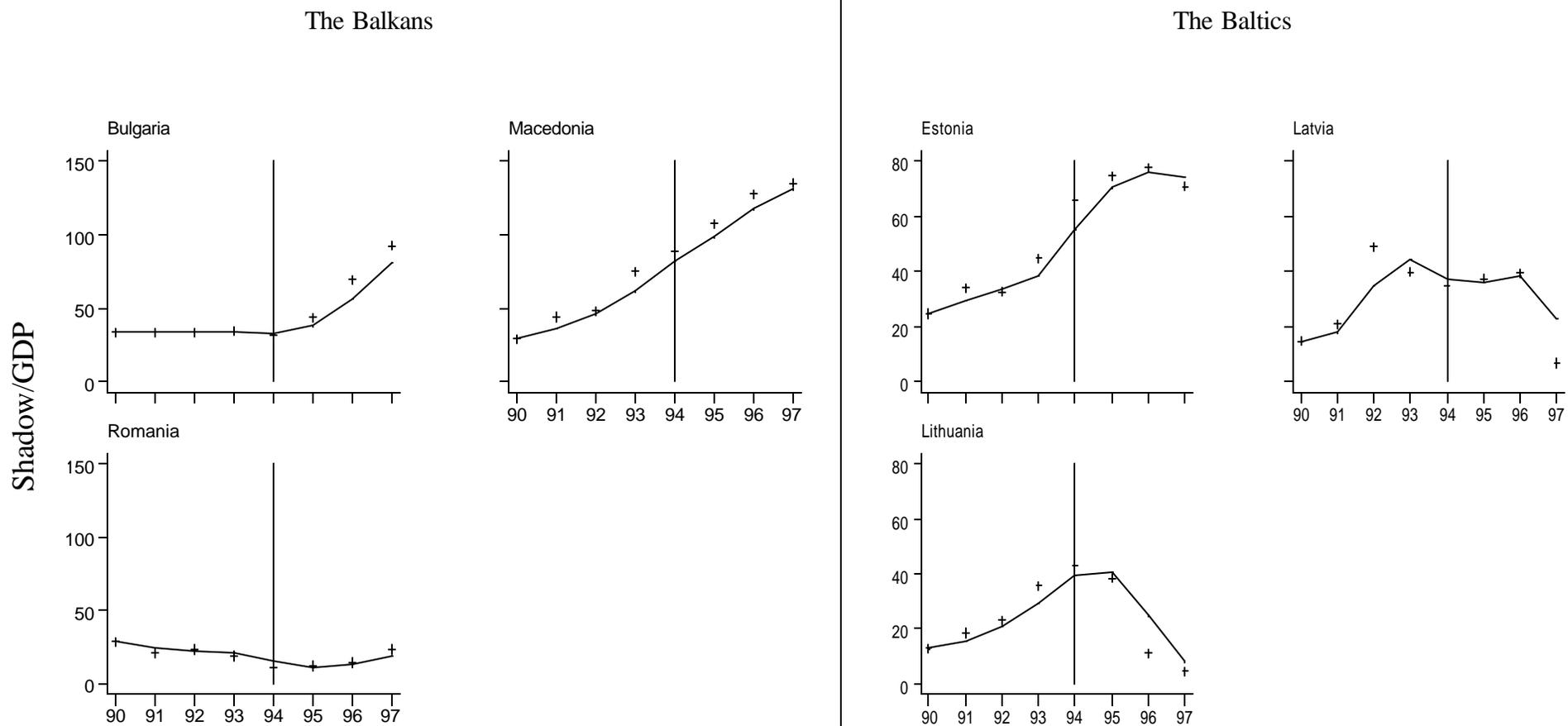
Notes and source: See end of table.

Figure 1: Trends in the shadow economy's size relative to official GDP, using the MTE method, transition countries, 1990-1997. (continued)

The Western FSU
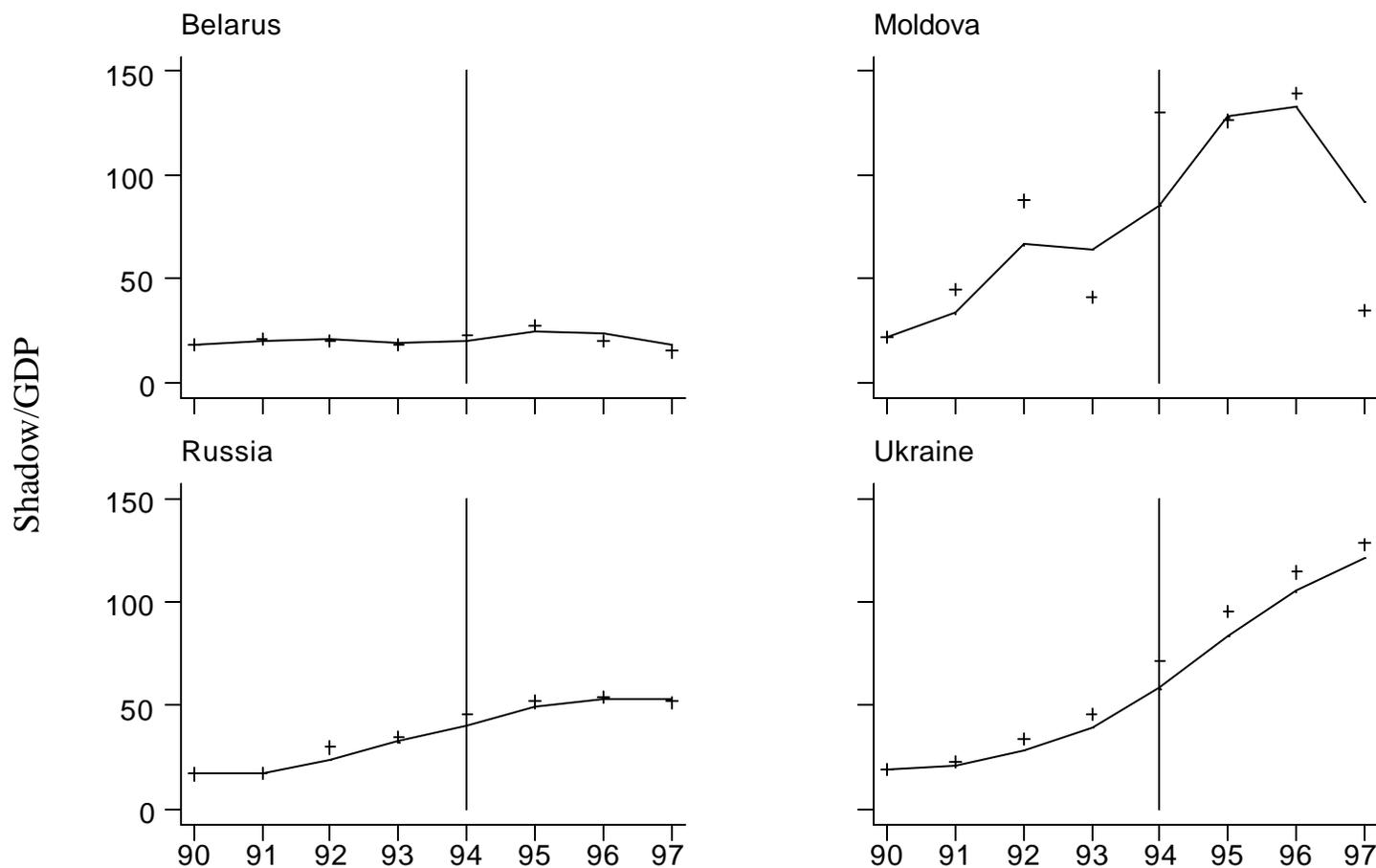
Notes and source: See end of table.

Figure 1: Trends in the shadow economy's size relative to official GDP, using the MTE method, transition countries, 1990-1997. (continued)

The Caucasus
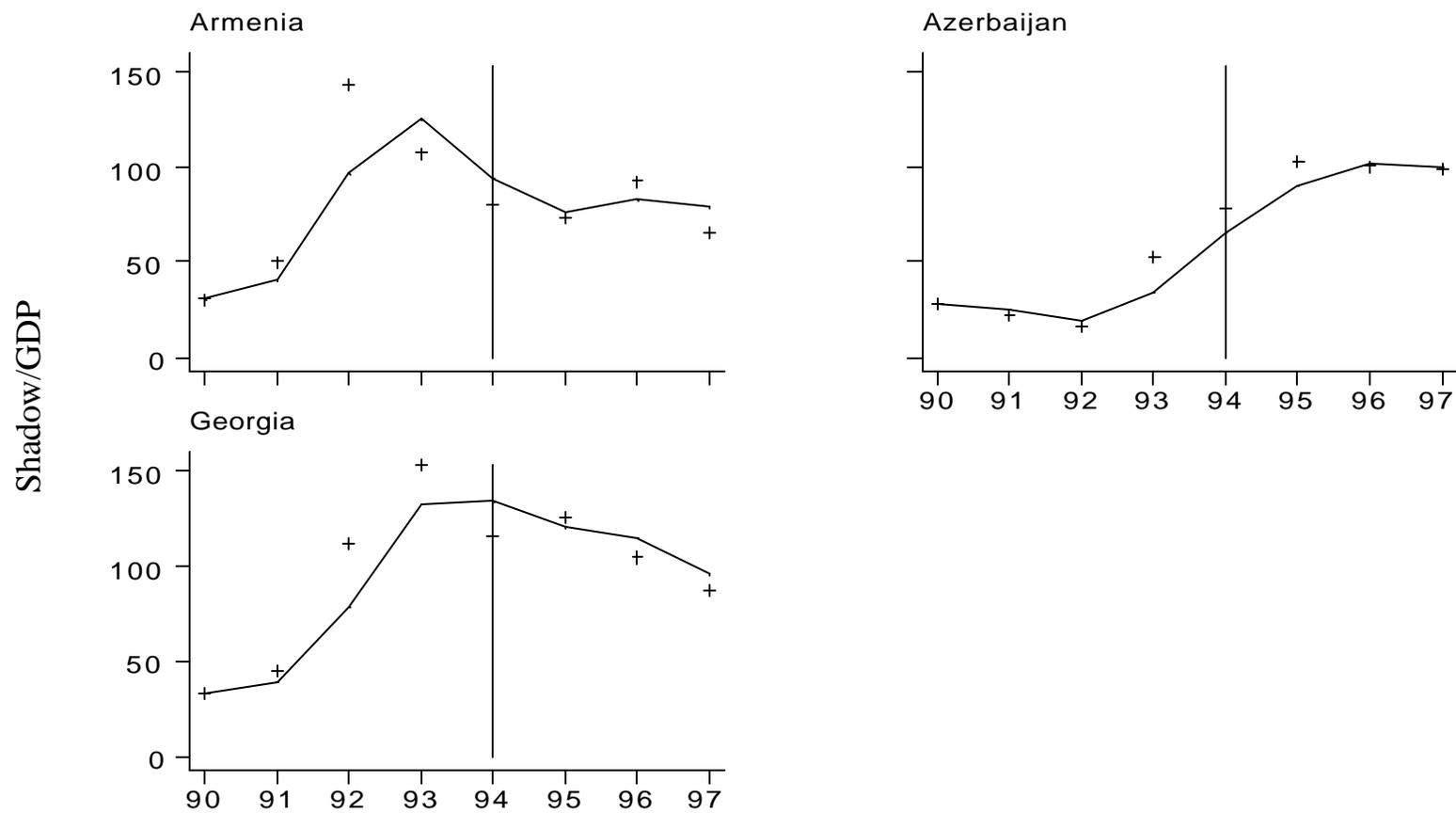
Notes and source: See end of table.

Figure 1: Trends in the shadow economy's size relative to official GDP, using the MTE method, transition countries, 1990-1997. (continued)

Central Asia
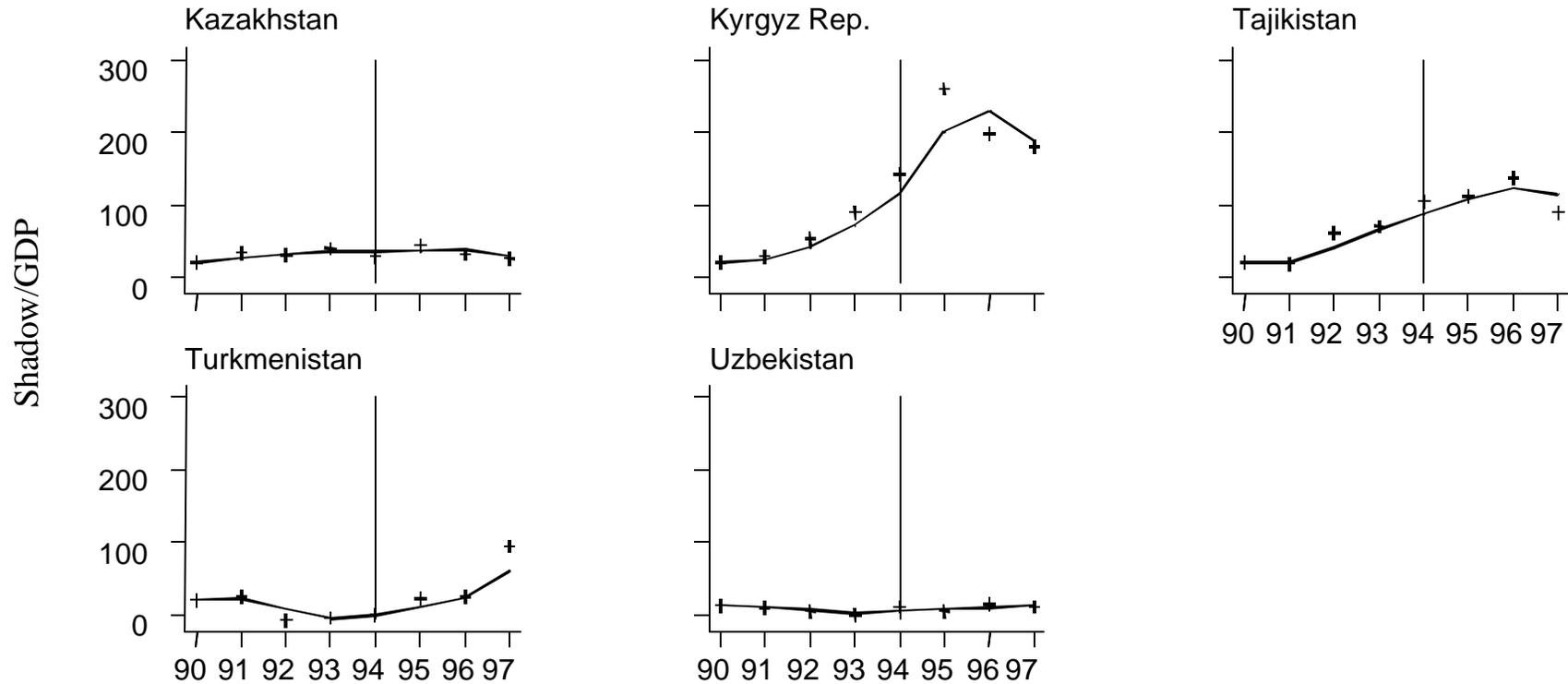
Notes: Vertical line at 1994 represents a potential structural break in the data. From 1990-1994, Johnson *et. al.* (1998) electricity elasticities of GDP are applied to EBRD (1999) electricity data. From 1995 onward, see section 3.2. + refers to annual estimates, curve refer to two-period moving average (*t* and *t*-1).

Sources: Official GDP from EBRD(1999), total economic activity and shadow economy estimates from section 3.2.

Figure 2: Trends in official GDP and TEA using the MTE approach, both relative to TEA in 1990, Transition Countries, 1990-1997.

Figure 3: Trends in the shadow economy's size, using the MTE approach, relative to official GDP by initial conditions clusters, Transition Countries, 1990-1997.

Notes: Vertical line at 1994 represents a potential structural break in the data. From 1990-1994, Johnson *et. al.* (1998) electricity elasticities of GDP are applied to EBRD (1999) electricity data. From 1995 onward, see section 3.2. Albania (Cluster 4) was not included in this study.

Figure 4: Trends in official GDP and TEA using the MTE approach, both in percent relative to TEA in 1990 by initial conditions cluster, Transition Countries, 1990-1997.
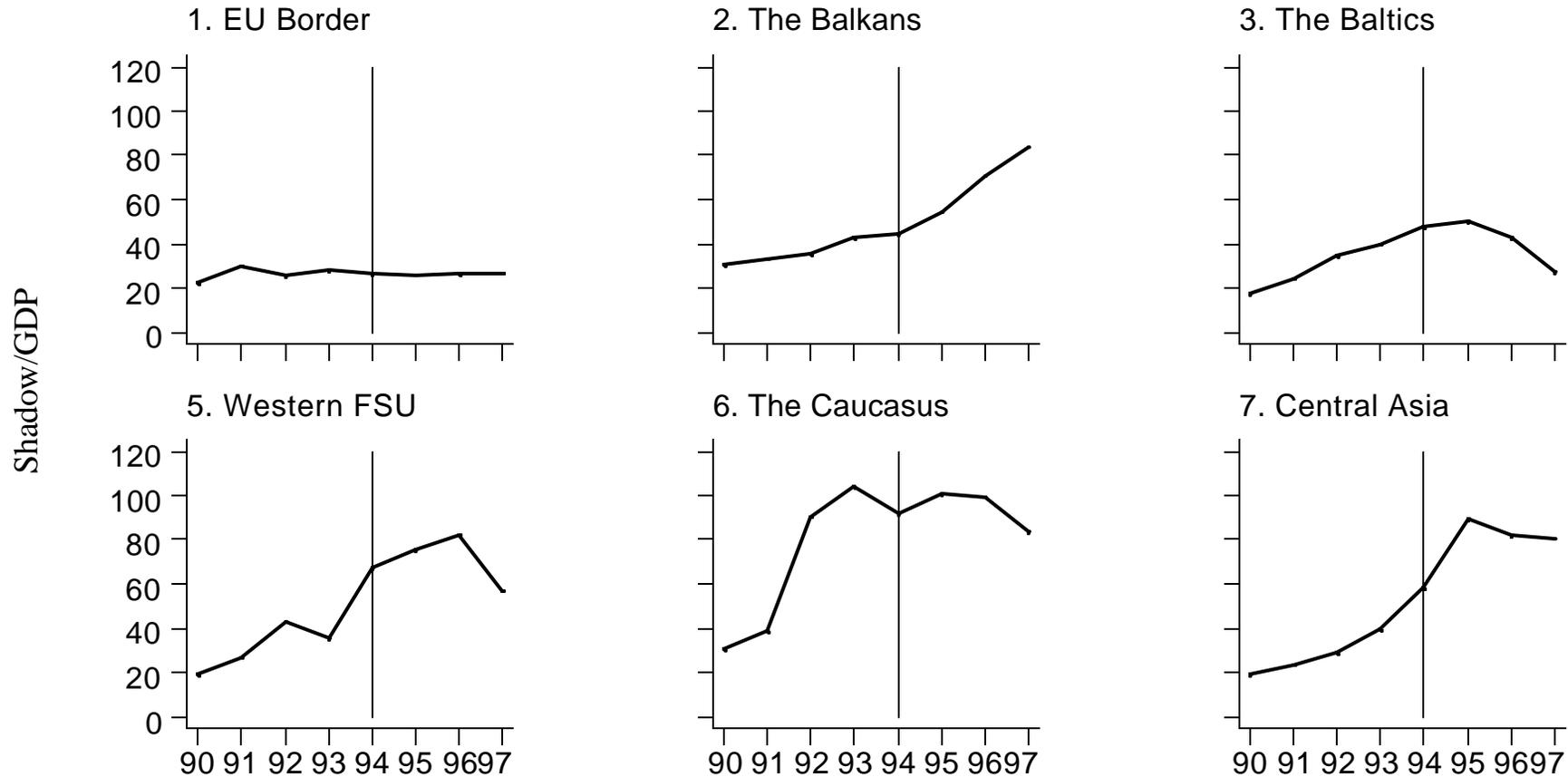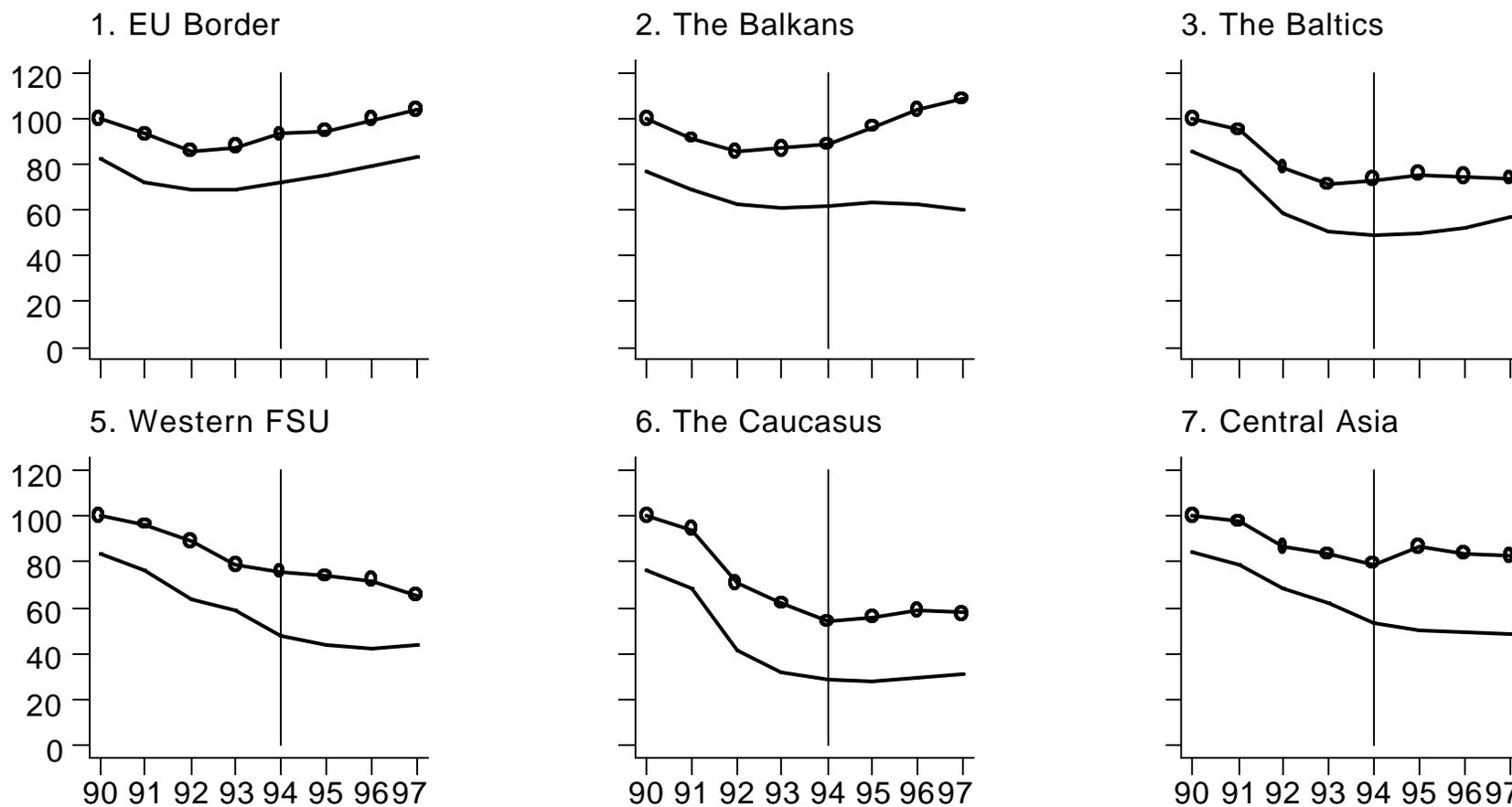
Sources: Official GDP comes from EBRD (1999). Total economic activity calculated using MTE method of section 3.2.

Notes: Solid line refers to the ratio official GDP to TEA 1990. Albania (Cluster 4) was not included in this study.

Table 2: The shadow economy's size, using the SIMC approach, relative to official GDP, Transition Countries in 1997.

Cluster	Country	Cause set 1*	Cause set 2*	Average Value	Average Rank**	MTE(1997)*** Value	MTE(1997)*** Rank**
				Shadow size relative to official GDP			
All transition countries		67	64	65	12.7	65	13.0
EU Border States (1)	*Average*	42	35	39	5.5	28	7.5
	Croatia	72	69	70	14	35	9
	Czech Republic	34	23	29	3	24	8
	Hungary	37	23	30	5	39	11
	Poland	29	23	26	2	14	2
	Slovakia	54	49	52	8	14	3
	Slovenia	26	23	24	1	43	12
The Balkans (2)	*Average*	58	69	62	11.3	69	14
	Bulgaria	64	69	66	13	56	15
	Macedonia	61	na	61	11	131	22
	Romania	50	69	59	10	19	5
The Baltics (3)	*Average*	46	32	39	5.7	40	9.7
	Estonia	37	23	30	4	74	16
	Latvia	47	36	41	6	21	6
	Lithuania	54	36	45	7	23	7
Albania (4)	Albania	100	62	81	na	na	na
Western FSU (5)	*Average*	70	74	72	13.8	81	15.5
	Belarus	63	69	66	12	18	4
	Moldova	59	49	54	9	133	23
	Russia	89	88	89	19	53	14
	Ukraine	68	88	78	15	121	21
The Caucasus (6)	*Average*	93	82	88	18.7	91	18.0
	Armenia	87	88	88	18	78	17
	Azerbaijan	98	88	93	21	100	19
	Georgia	96	69	82	17	96	18
Central Asia (7)	*Average*	93	94	93	21	80	13.6
	Kazakhstan	92	88	90	20	39	10
	Kyrgyz Republic	73	88	81	16	186	24
	Tajikistan	102	88	95	22	111	20
	Turkmenistan	105	88	97	23	52	13
	Uzbekistan	94	114	104	24	13	1

Notes: *Cause set 1: "rule of law" from Sachs, Zinnes and Eilat (2000b), social security collection ratio from EBRD (1999), electricity collection ratio from EBRD (1999). Cause set 2: corruption indicator from Freedom House (1999) and regulation burden from Heritage Foundation (1999). **1=Smallest shadow economy. ***2-period moving average. *Other sources:* Official GDP comes from EBRD (1999). With the exception of MTE (1997) shadow economy activity is calculated using SIMC method of section 3.3.

Figure 5: Intracluster variation of the shadow economy's size, using the SIMC approach, in percent relative to official GDP, Transition Countries, 1997.
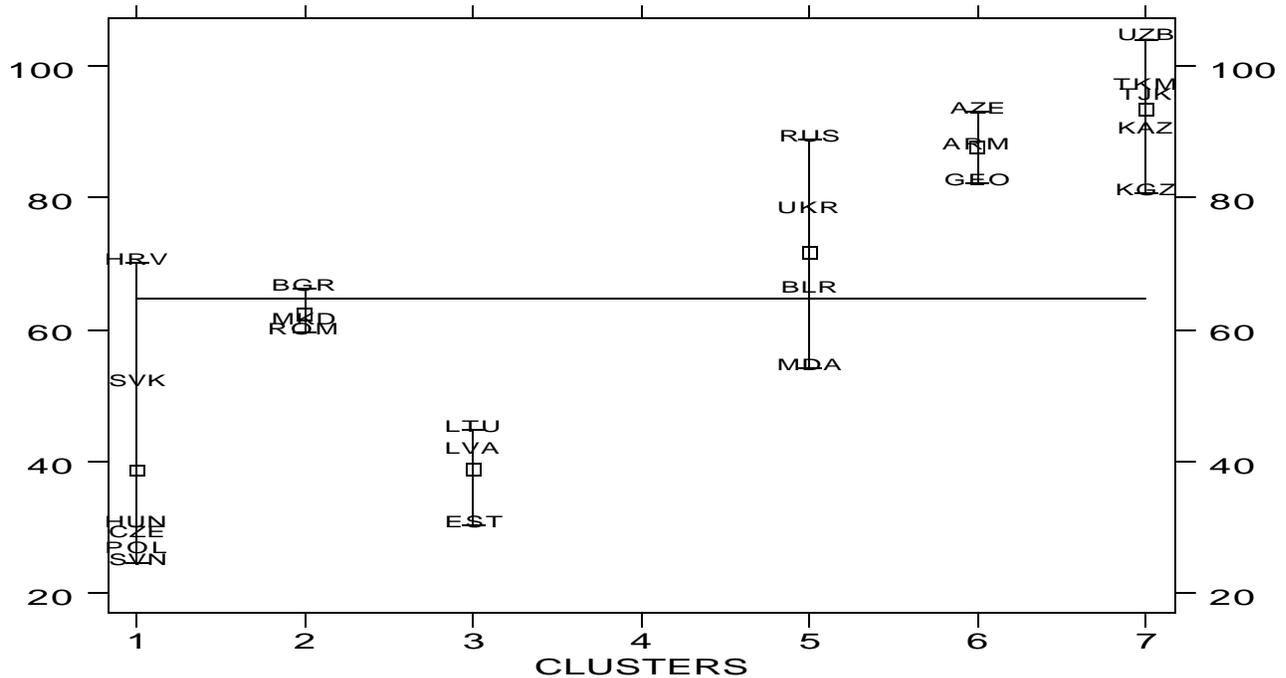
Sources/notes: Official GDP comes from EBRD (1999). Total economic activity calculated using SIMC method of section 3.3. Horizontal line is sample average; squares are cluster averages.

In Figure 5 we graphically present by cluster the shadow economy size relative to official GDP from the "average" column in Table 2. At a general level this figure confirms the impressions of Table 2. They also tend to justify the Sachs, Zinnes, and Eilat (2000a) cluster approach in that the clusters are generally "tight," the exception being the EU Border States. For that cluster, we observe the tendency (also reported in Sachs, Zinnes, and Eilat) for the "new" and "old" states to bifurcate: Slovakia and Croatia are well above Poland, the Czech Republic, and Hungary. [15] At the cluster level we also see that, while the Balkans have average shadow economy sizes (the horizontal line), the Baltics and the EU Border States have smaller-than-average shadow economy sizes while the Western FSU, the Caucasus, and Central Asia have higher-than-average sizes. (Note that the square in each cluster represents the *cluster* average value).

4.2   Comparisons with other studies of transition economies

In this section, we compare our MTE and SIMC estimates of the shadow economy in transition countries to each other as well as to those of several existing studies in the literature.

Table 2 also allows us to compare our MTE and SIMC estimates of the shadow economy relative to official GDP for the year 1997. At the cluster level, there is substantial agreement – and more so when the average ranks are compared. At the country level, however, the situation is

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[15] According to bifurcation, Slovenia must be judged as "out of place." In fact, our MTE estimates for 1997 also suggest that the SIMC estimate for Slovenia is off.

much less sanguine, especially for particular countries. In the EU Border States cluster, Slovakia and Slovenia receive opposite scores by the two methods. For the Balkans, Romania's MTE score is much lower than the SIMC score, with the opposite being the case for Macedonia. For the Baltics, Estonia is much lower than Latvia and Lithuania under the MTE approach, with the opposite being the case under SIMC. In the Western FSU, Belarus scores extremely low under the MTE approach.[16] Both methods treat the Caucasus similarly. While the SIMC method generates similar scores for each of the Central Asian countries, Uzbekistan and Kazakhstan receive very low scores under MTE (in fact, Uzbekistan has the lowest shadow economy of all transition economies under MTE and the highest under SIMC!). In conclusion, while at the region and cluster level a similar picture emerges under both methods, at the country level there is limited agreement.

The gaps between the two methods can be explained by the fact that they are not capturing exactly the same thing. The MTE method tries to look directly at each country and "find" its shadow activities. It will therefore be able to capture country idiosyncratic elements. On the other hand, it may be distorted when the electricity data is inaccurate or when there is a breakdown in the relationship between electricity use and TEA. The SIMC method, on the other hand, measures the *potential* for a shadow economy in a country based on a fixed set of causes. This method, therefore, cannot respond to unique country characteristics, but is less prone to data problems. Thus, for example, Uzbekistan has the biggest potential for a shadow economy based on the SIMC approach but has yet to realize it, scoring the lowest on the MTE approach.

As a further test of our MTE estimates we compare them in Table 3 to other estimates found in the literature that use the physical input approach. We choose those of Johnson, Kaufmann, and Zoido-Lobatón (1998) and of Lackó (1999), averaging the estimates for the years 1990-1993 and 1994-1995 as proposed in Table 5 of Schneider and Enste (2000) (though without the latter's error.[17]) This comparison is only a partial check since our modifications to the total electricity method only begin in 1995. At the level of the full sample, our estimates are the same in the earlier period but about 15 percentage points higher in the later one. At the cluster level, our estimates are broadly similar to the other studies, except for Central Asia in 1994-5 where our number is double theirs. At the country level, the main differences are for Estonia, Macedonia, and Moldova, with our estimates being roughly double the others.[18]

In conclusion, we corroborate the findings of the other studies, showing that the shadow economy is large and has increased over the period of transition, particularly in the non-Baltic FSU countries. Our estimates add to the literature, on the other hand, by extending coverage to several additional countries (six more) and up to 1997 (three more years).

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[16] This is perhaps not surprising since the rise of shadow activities is usually a response to restructuring done in a country. Belarus is the only country in this region that hardly went through any restructuring.

[17] We should note that these two sources are also presented together in Table 5 of Schneider and Enste (2000), but there the authors erroneously compare shadow size relative to *official* GDP from Lacko (1999) with shadow relative to *total* GDP (i.e. TEA) from Kaufman et al. (1998). These are two different measurements, and therefore the comparison and the following discussion are void.

[18] The authors were unable to find an explanation as to why Estonia scored so highly under MTE approach.

Table 3: A comparison of the size of shadow economy relative to official GDP in this study, using the MTE approach, with estimates of its size in other studies, Transition Countries in 1997.

Cluster	Country	Shadow size relative to official GDP					
		Average 1990-1993			Average 1994-1995		
		EZ [a]	JKZ [b]	Lackó [c]	EZ [a]	JKZ [b]	Lackó [c]
All transition countries [e]		30	29	32	53	37	39
EU Border States (1)	*Average* [f]	26	25	32	26	21	29
	Croatia	33	30 [d]	39	33		38
	Czech Republic	17	16	29	24	17	23
	Hungary	38	43	31	36	40	31
	Poland	25	26	32	16	16	26
	Slovakia	14	17	31	14	12	30
	Slovenia	32	na	28	34	na	24
The Balkans (2)	*Average* [f]	35	27	35	49	36	38
	Bulgaria	34	35	30	38	49	35
	Macedonia	49	na	40	99	na	47
	Romania	23	19	34	12	22	31
The Baltics (3)	*Average* [f]	29	34	34	49	37	42
	Estonia	34	32	32	70	23	37
	Latvia	31	34	32	36	53	43
	Lithuania	23	38	38	41	34	47
Western FSU (5)	*Average* [f]	31	35	35	71	61	46
	Belarus	20	16	32	25	24	45
	Moldova	49	43	na	128	61	na
	Russia	25	39	37	49	69	39
	Ukraine	31	41	38	84	90	54
The Caucasus (6)	*Average* [f]	66	73	46	96	158	56
	Armenia	83	na	na	77	na	na
	Azerbaijan	30	57	41	91	146	49
	Georgia	86	89	51	121	171	62
Central Asia (7)	*Average* [f]	28	20	24	74	30	35
	Kazakhstan	32	29	26	38	52	38
	Kyrgyz Republic	49	na	24	201	na	37
	Tajikistan	43	na	na	108	na	na
	Turkmenistan	9	na	na	12	na	na
	Uzbekistan	7	11	23	9	9	29

Notes: (a) The estimates from Table 2 herein. (b) From Johnson, Kaufmann and Zoido-Lobatón (1998). (c) From Lackó (1999). (d) From Madzarevic and Milkulic (1997;17) as quoted in Schneider and Enste (2000). (e) Average of the cluster scores. (f) Not all cluster averages are for the same number of years due to coverage by original authors.

4.3 Comparison with other countries

Prior to analyzing the policy implications of our shadow economy measures, we briefly contrast our estimates for transition countries (based on the MTE method) to those of nontransition countries (also based on a physical input method). In doing this comparison we note that Schneider and Enste (2000;104) conclude, based on their worldwide comparison of the size of shadow economies, that the electricity method shows values in the middle when compared across all the other estimation methods where overlapping years are available.

Let us begin by first summarizing the findings of Schneider and Enste (2000) for the non-transition regions. For the OECD countries their literature review finds that:

- For eighteen OECD countries, the average for 1990 was a shadow size of 15.1 percent of official GDP. Highest were Spain, Greece, and Ireland (around 20 percent). Lowest were Switzerland and the United States (about 10 percent)[19].
- For seven OECD countries, the period 1960 to 1995 (using the currency demand approach) registered an increase of 6-16 percentage points in the shadow size.[20]

For LDCs:

- For eight African countries, the average for 1990 was a shadow size of 39-76 percent of official GDP. Highest was Nigeria while the lowest was Morocco.[21]
- For ten Central and South American countries, the average for 1990 was a shadow size of 25-60 percent of total GDP. Highest were Guatemala, Mexico, and Peru while the lowest were Columbia, Paraguay, and Brazil [22]
- For eleven Asian countries, the average for 1990 was a shadow size of 13-70 percent of official GDP. Highest was Thailand while the lowest were Singapore and Hong Kong (both 13 percent).[23]

The most striking result here is that almost all countries indicate a positive trend in the size of the shadow over the years. This result is robust even in light of the difficulties in the various estimation methods. Second, while there is apparently a strong inverse correlation between shadow economy size and GDP per capita, what also seems to count is culture and quality of government institutions.

Next, in Table 4 we divide countries into regions and shadow economy size. For the latter, we define shadow activity as low-level if it is less than 20 percent of official GDP, medium-level if it is between 20 and 40 percent of official GDP, and high-level if it is over 40 percent of official GDP. What we find is that the FSU has shadow activity intensities on a par with the worst cases in Africa, South America, and Asia. The EU Border States, on the other hand, perform on the level of the best performers in Africa, South America and Asia (and the worst performers in the OECD). Only Poland, Belarus, and Uzbekistan (though the latter's data are somewhat questionable) perform at the OECD average.

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[19] Schneider and Enste 2000;102.
[20] Schneider and Enste 2000;81.
[21] See Schneider and Enste 2000;100.
[22] See Schneider and Enste 2000;100.
[23] See Schneider and Enste 2000;100.

Table 4: A comparison of the size of the shadow economy relative to official GDP for transition country clusters (for 1997) and other major regions of the world (for 1990).

	Size of shadow economy relative to official GDP (in percent)					
	Low (<20 percent)		*Medium (20-40 percent)*		*High (>40 percent)*	
Group	*Country*	*Value*	*Country*	*Value*	*Country*	*Value*
EU Border States*	Poland	14	Croatia	35		
			Hungary	37		
			Czech Republic	24		
			Slovakia	24		
			Slovenia	26		
The Balkans*			Romania	30	Bulgaria	60
					Macedonia	80
The Baltics*			Estonia	38	Latvia	43
					Lithuania	47
Albania*					Albania	100
Western FSU*	Belarus	18			Russia	53
					Moldova	60
					Ukraine	80
The Caucasus*					Armenia	78
					Azerbaijan	90
					Georgia	85
Central Asia*	Uzbekistan	13	Kazakhstan	39	Kyrgyz Rep.	100
					Tajikistan	100
					Turkmenistan	60
Africa**	Mauritius	20	Botswana	27	Egypt	68
			Morocco	39	Nigeria	76
Central & South America**			Costa Rica	34	Peru	44
			Paraguay	27	Guatemala	61
			Brazil	29	Mexico	49
			Chile	37		
Asia**	Hong Kong	13	Israel	39	Philippines	50
	Singapore	13	South Korea	38	Thailand	71
			Sri Lanka	40		
			Malaysia	39		
OECD**	USA	11	Greece	22		
	Norway	9	Ireland	21		
	France	12	Spain	23		
	Germany	15	Italy	20		
	Japan	13				

Notes: *Data are from Table 1, above and are for 1997. Transition country estimates use the MTE method of section 3.2; other regions use the electricity method. **Data are for 1990 from Schneider and Enste (2000;100-102).

5　The impacts of the shadow economy on development in transition

Does a bigger shadow economy help or cripple economic development? It is usually the case that the economy is better off if, *ceteris paribus*, an activity is done officially than if it is done in the shadow economy. It is much less obvious, however, that it is better that the activity not be done at all rather than be done in the shadow. Perhaps only activities that are *per se* illegal can fall into this latter category. This observation causes a major difficulty both to empirical research and to policy, since the simple fact that a large shadow economy is observed does not reveal what the alternatives to the shadow were.

In section 5.1 we lay out the linkages found in the literature between the size of the shadow economy and economic development. We do this according to whether the influences are good or bad for development. In section 5.2 we look at some regression results regarding the growth of the shadow economy, official GDP, and total economic activity. In section 5.3 we provide our evidence about how the shadow economy has evolved with changes in government policy and institutional development. In section 5.4 we consider the implication of the shadow economy on the nature of competition in a country. In section 5.5 we look at its effect on international competitiveness.

5.1　General

5.1.1　Bad influences of the shadow economy

The negative influences of the existence of a shadow economy on development can be arranged according to whether they lead to macroeconomic, microeconomic, or social problems.

The main macroeconomic problems that the literature identifies are the following:

- Public finance: As demonstrated by the Laffer curve, if high tax rates push activities out of the official economy, they can shrink the tax base and thereby eventually reduce overall tax revenue. This revenue loss induces the government to increase taxes further and so on. In the case where shadow economies are large, this "vicious circle" story is even intensified: when firms become unofficial, taxes receipts go down and so does the quality of public goods and services. To the extent that official firms benefit from public goods more than unofficial ones, then this fall in the quality of public services again pushes firms to the shadow (this second loop can prevail even in the absence of tax increases). Turning to the expenditure side (and related to several microeconomic points below) public sector investment and service provision may be underprovided as decisionmakers underestimate the number of beneficiaries.

- When tax revenues provide an insufficient source of budgetary financing (and debt and domestic bond markets are unavailable), governments are often forced to resort to inflationary financing.

- Official statistics provide the wrong indicators for macro-policy decisions (Tanzi 1999; Frey and Schneider *et. al.* 2000). For example, an increase in *official* unemployment (or labor market participation) may not signal as serious a need for a major Keynesian-style fiscal stimulus, but rather a shift of economic activity into the shadow economy.[24]

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[24] Curiously, at least one transition economy, Tajikistan, seems purposely to *over*estimate its employment rate in an effort to make its government look better to the opposition.

- The presence of a shadow economy can make macro policy less effective. This, in turn, can make it harder to attain and sustain macroeconomic stability. For example, monetary policy is weakened since shadow economy firms are less connected to the banking system and capital markets. Similarly, since shadow economy firms do not pay taxes, revenue-side fiscal policy via changes in the tax rates has a weaker stimulative (or depressing) effect. Though some transition economies follow countries in other regions in that shadow economy activity is based on cash, many transition economies – and particularly those such as the Ukraine, which experienced bouts of high inflation – actually flee cash and transact in either foreign currencies or barter. While this has profound implications for monetary policy, it also carries implications for the appropriate method used to measure the shadow economy.

The literature also identifies a host of microeconomic-based problems that the presence of a shadow economy creates. These are mostly related to the efficiency with which the economy operates (Tanzi 1982). We mention the most central among these.

The existence of a shadow economy creates the opportunity for distortions in resource allocation. Consider some examples. Shadow firms *ceteris paribus* have an unfair advantage in labor markets since they are not subject to labor regulations and therefore can pay higher wages. Similarly, they can draw demand away from the official firms they compete with since their prices would be lower (no taxes for the purchaser to pay).[25] Due to not being registered, shadow firms may have trouble providing collateral. This may distort investment away from the shadow economy firm and toward the official firm. For these and other reasons mentioned in this section, shadow economy activity is likely to be bifurcated toward small firms (that cannot afford official economy transactions costs) and large firms (which misreport output). This, by itsel, will have an allocative efficiency impact. Finally, one may expect the potential for shadow economy activity to affect the composition of national economic output and growth. This is because resources may be allocated according to which sectors are most amenable to shadow economy activity (e.g., trade, services, and construction) instead of according to signals of real economy scarcities.

The inherent greater risk of doing business in the shadow economy and the greater difficulty in raising funds from the capital markets, lead the shadow economy to focus on the short-term and neglect large-scale and sophisticated investments (Kaufmann and Kaliberda 1996;12). As a consequence, shadow economy firms may tend to decapitalize their assets or operate more labor-intensively than would be optimal given the true opportunity costs of factor inputs in the country.

Last, operating in the shadow, while avoiding the costs of dealing with onerous regulations, still implies additional direct losses that raise the cost of production. These include time spent on bribing, avoiding licenses and taxes, and seeking private sector alternatives to public services (when the latter are not available due to the shadow firm's status). (Kaufmann and Kaliberda 1996).

Finally, we find a number of social consequences of a shadow economy discussed in the literature. Schneider and Enste (2000) and others point to the shadow economy as leading to a disintegration of social norms. The impact on the respect for official institutions, norms, and rule-of-law is important. It is true that the shadow economy can be seen as an indicator of a serious deficit of legitimacy of the present social order and the current rules of economic activities. However, here we again run into the two-way causality referred to above. Is the

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[25] On the other hand this would work against shadow firms under a VAT, since when a shadow firm makes a purchase which includes VAT, it cannot use the VAT paid as credit on output sales.

shadow economy a cause of bad morals or a consequence (and, therefore, an indicator) of them? Illegal activity aside, the literature seems to suggest tentatively that the latter is probably the case. On the one hand, poorly paid, overextended, and often incompetent public sector officials and an often profoundly inefficient use of tax revenues collected both lead to an atmosphere where avoiding state predation can even appear morally just. On the other hand, free-riding on public services paid for by the few could lead to further opting out by contributors, which could lead to a spiraling collapse of such services.

A second potential concern of an expanding shadow economy is the possible reduced eligibility of social safety net services (e.g., health, unemployment) for workers in shadow firms. While this may be less a problem for some transition countries that have a tradition of state-provided services independent of employment status (or in the case where a firm operates both officially and unofficially), it is nonetheless a concern.[26]

5.1.2 Good influences of the shadow economy

The literature, however, also recognizes many positive influences of the existence of a shadow economy on development.

On the macro side, perhaps the most obvious benefit of a shadow economy is that it helps maintain economic activity when rent-seeking and corruption reduce official economic activity , by raising the cost of official production. It can increase competition to the official sector and impose boundaries on governmental activities. Also, since much of the money earned in the unofficial economy eventually gets spent in the official economy, shadow activity may have a positive effect on growth and taxes. Asea (1996) adds that it may contribute to the creation of markets and increase financial resources.

On the micro side, the shadow economy in a transition economy may provide market experience to entrepreneurs (Kaufmann and Kaliberda 1996).

Turning to social benefits, a shadow economy may have a positive effect on income distribution. To the extent that small firms provide employment to those with lower income, the existence of a shadow economy may provide a social safety net. This occurs since regulation and taxes related to operating in the official economy tend to be a higher percentage of business costs for smaller firms. Removing the source of regressive policy can improve a country's income distribution.

5.2 The impacts of the shadow economy on economic growth

In this section, we relate our estimates of changes in the level of shadow economy activity with economic growth and its related performance correlates. We also attempt to quantify some of the positive and negative impacts of the shadow economy as identified in section 5.1. We begin by stating the findings from the existing literature.

In the OECD there have been numerous studies, for example the study of Adam and Ginsburgh (1985) about Belgium, whose shadow economy is among the largest in Europe. They find a positive relationship between growth of the shadow and the official economies.

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[26] There are cases in which workers appear legally employed at a state-owned enterprise even though the factory is not operating. They do this to continue to receive social benefits such as housing and daycare. They are, in fact, working elsewhere including in the shadow economy. (They may also remain on the company payroll – though no pay is forthcoming – as a type of "option" in the event the firm is privatized and the government or new owner provides severance compensation).

Turning to Latin America, Loayaza (1996) finds that in economies where (1) the statutory tax burden is larger than the optimal tax burden and (2) the enforcement of compliance is too weak, the increase of the relative size of the informal economy generates a reduction of official economic growth. In particular, for a one-percentage point increase in the shadow economy (relative to official GDP), the growth rate of official real GDP per capita decreases by 1.22 percentage points. The negative affect is due to the shadow economy's congestion effects that (1) reduce the availability of public services to the official economy and (2) result in the existing public services being used less efficiently. [27]

In the case of transition countries, Kaufmann and Kaliberda (1996) found that the unofficial economy mitigated the drop in official GDP, especially in countries that experienced a large drop. Only slightly over half of the official GDP decline was translated into a decline in total economic activity. The other half was absorbed by the growing unofficial sector. Using OLS regression, they found that for every 10 percent cumulative decline in official GDP, the share of the unofficial economy in the overall grew by almost 4 percent.

Nevertheless, Schneider and Enste (2000) reach the conclusion that the effect of an increase of the shadow economy on economic growth remains considerably ambiguous, theoretically and empirically. We now proceed to examine what our new estimates reveal on these issues.

First, we do not find an inverse relationship between the 1990 level of shadow activity and its level by 1996 or 1997.[28] Rather, the following cross-section regression indicates that the deeper the recession (where GDPMIN is the lowest value of the ratio GDP to GDP in 1990 over the period 1990-1997), the larger is the level of shadow activity relative to GDP by 1997 (SHDGDP97):

$$\text{SHDGDP}(97) = 207 - 111 \text{ GDPMIN} - 0.013 \text{ GDPPC}(89) + \varepsilon \qquad N=21$$
$$\qquad\qquad (6.7)\quad (-2.7)\qquad\qquad (-2.9)\qquad\qquad \text{Adj.R-squared}=0.51$$

Here, we have used the initial level of per capita income (GDPPC) as a control for general, economic, initial conditions (t-statistics are in parenthesis).This result suggests that the shadow economy is in part a response to economic necessity during economic depression. It is also part of our hysteresis story: once created, the shadow economy is hard to get rid of, regardless of country performance between the trough of recession and 1997. This relationship is illustrated in Figure 6.

To further investigate the impacts of a fall in GDP on the size of the shadow economy we estimate the following panel regression (t-statistics in parenthesis):

$$\text{SHD}^{dev} = 39 - 0.31 \text{ GDP}^{dev} + 0.06 \text{GDP}^{dev}*\text{TEA\_INCR} + \varepsilon \qquad N=192$$
$$\qquad (9.8)\quad (-5.6)\qquad (2.4)\qquad\qquad\qquad \text{Adj.R-squared}=0.61$$

Here SHD^{dev} and GDP^{dev} are the size of the shadow economy and GDP, *both* with respect to TEA(90) (total economic activity in 1990), and after the subtraction of the cluster mean for each variable[29]. TEA_INCR is a dummy variable equal to 1 if TEA (total economic activity) is increasing and zero otherwise. A scatter plot of the results is presented in Figure 7.

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[27] This result is not generally accepted since it depends on a number of contentious assumptions. (See Asea 1996).

[28] The correlation is 0.2.

[29] This is an alternative way of doing a regression with fixed effects.

Figure 6: The shadow economy as a percent of GDP in 1996-7 compared to the depth of the transition recession.

Sources: Shadow estimates are based on the MTE method in Table 1; GDP from EBRD (1999).

This regression contains two important results. First, we see that a change in GDP is associated with an *opposite* change in the shadow's size. Thus, for example, a one-dollar fall in GDP is associated with a 31-cent increase in the size of the shadow economy (if TEA is falling). This means that the shadow economy dampens the recessionary impact of a fall in official GDP. It also means that GDP growth is accompanied by shrinkage of the shadow economy. Second, the degree of this effect depends on whether TEA is rising or falling. Thus, when TEA is rising, a dollar increase in GDP results in only a 25-cent *decrease* in shadow activity. This leads to the important result that there is *inertia* or hysteresis in the creation and destruction of the shadow economy. This result is illustrated in Figure 7 where the moderately sloped line represents the response of the shadow to changes in GDP when TEA is rising and the steeply sloped line represents the shadow's response in the case when TEA is falling. The bold line represents the case for the pooled sample.

One must remember that these results do not resolve the important issue of causality. To what extent is the shadow economy a response to a lack of opportunity in the formal economy during recession, an escape from overregulation and corruption, or an opportunistic move in the face of weak institutional enforcement? It is to these issues that we now turn.

Figure 7: Asymmetric responses of the shadow economy to changes in GDP, depending on whether TEA is rising or falling[30].
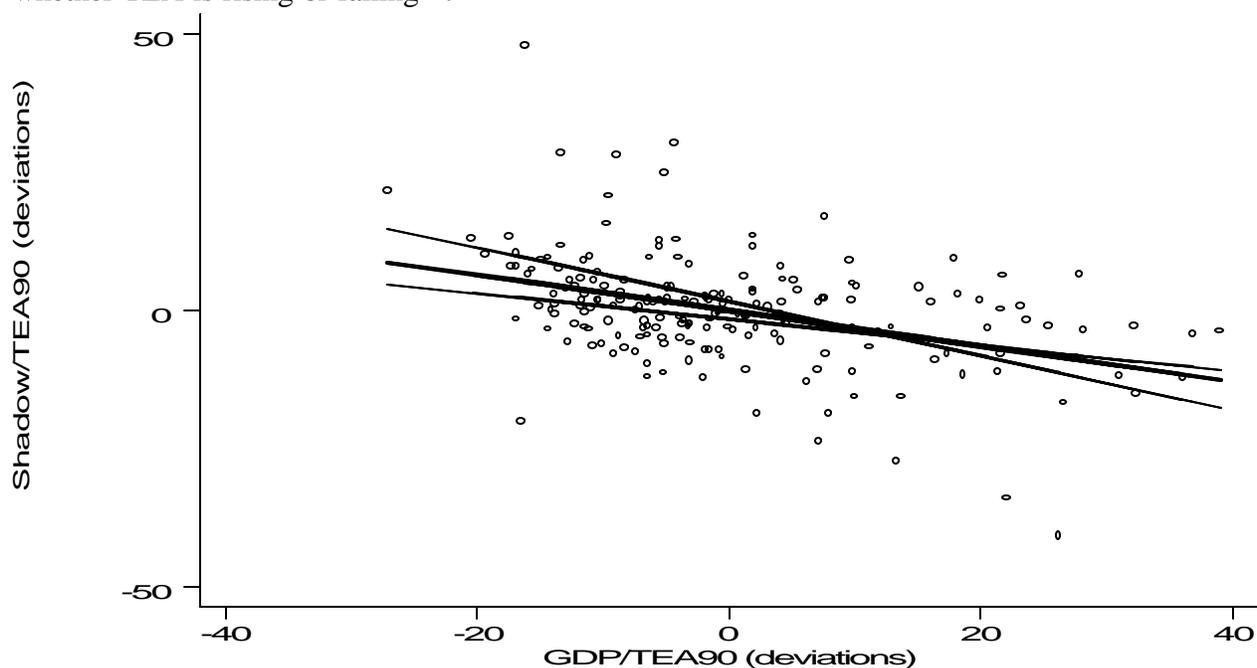
Sources: Shadow estimates are based on the MTE method in Table 1; GDP from EBRD (1999).

5.3   Initial conditions, policy and the development of the shadow economy

In this section we use our MTE shadow economy estimates to assess the extent to which initial conditions and economic policy has contributed to the growth of a shadow economy. We do this by first providing a series of bivariate correlations between the size of the shadow economy relative to GDP and proxies of the causes and effects of the shadow economy as discussed in Section 2. We discuss the implications of each of these. We then select a small number of these relationships for more careful econometric analysis.

Following the organizational principles of Section 2, we classify causes and effects of a shadow economy into macroeconomic, microeconomic, and sociopolitical categories in Table 5. While bivariate correlations are intriguing, prior to discussing them we must stress an important caveat. Causality can sometimes operate from the effect's proxy variable to the shadow instead of vice versa. As an example of the reverse causation, it is possible that the presence of a large shadow economy causes the tax base to shrink and therefore requires the government to impose a higher rate of taxation per unit GDP.

Under macroeconomic issues, we include unemployment, monetary stability, government budget and administration, investment, and international transactions (capital and current accounts). In spite of the notorious problems with unemployment statistics in this region, we still

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[30] See explanations for Figure 7 in text above.

find a strong positive correlation between unemployment and shadow activity.[31] Regarding the use of local currency in the form of cash and demand deposits as measured by M2/GDP, we find a strong negative correlation, as illustrated in Figure 8.[32] This is consistent with the case studies, which find that most shadow activity takes place as barter or in foreign currencies such as dollars. We also find that, as expected, a larger shadow economy is associated with higher levels of corruption, regulation, and poor enforcement.[33] We find that tax *rate* measures have no strong correlation while measures of the quantity of tax *revenues* have a negative correlation. These findings are not surprising since a high tax share of GDP may reflect factors that go both ways: strong enforcement or more and better public services (and therefore a small shadow economy) on the one hand or an overbearing system of taxation (leading to a large shadow economy) on the other. It seems, therefore, that the former effect dominates.

Regarding international transactions, there is clear evidence that shadow activity is bad. In the case of current account transactions, the forces that cause shadow activity deter foreign activity in the country. As expected, greater shadow economy activity is associated with lower levels of investment, both from domestic and foreign sources. This reflects the shorter horizon of shadow firms and their reduced access to financing sources. Finally, we consider whether countries richer in natural resources might also be more prone to shadow activity. We do not find significant relationship here under univariate regression.

The one surprise concerning macroeconomics in Table 5 is inflation, which at a *P*-value of 0.10, is just significant with respect to shadow activity.[34] It is curious that the relationship is not stronger, since evidence suggests that currency instability pushes economic agents to transact in dollars or in barter and hence facilitates unrecorded activity.

Under microeconomic issues we include capital and labor markets, banking, rule of law, privatization, and regulation. Here we find, as expected, that over-regulation and corruption are associated with a greater shadow economy while greater rule-of-law, which would be a benefit to remaining official, mitigates shadow activities. Capital market and banking sector quality, which are benefits of being official, are inversely related to the size of the shadow economy. Thus, if capital and financial services are poor in a country, then the opportunity costs of moving to the shadow economy are lower and a larger shadow is observed. Figure 9 illustrates the negative relationship between the benefits of being official (access to the legal system, infrastructure, and capital markets) and the decision to operate in the shadow. Finally, large-scale privatization seems to have no effect on the degree of shadow activity, a theme we return to below.

Finally under sociopolitical issues we look at measures of human development and democracy. Here we see that greater shadow economy activity is associated with a worse social, political, and democratic environment. Note, however, that since health and education public services are generally "free" to individuals regardless of their employment status, the level of government expenditure on these is not related to the size of the shadow economy.

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[31] Here we dropped any observations for unemployment below 3 percent or above 30 percent. This essentially removed most of Central Asia, Ukraine, and Macedonia from this correlation calculation. The reason is that such extreme figures suggest questionable data.

[32] Note that in this graph, unlike most of the graphs in the paper, shadow/GDP is on the x-axis. The reason is that we believe that a large shadow is the cause of a low monetary depth and not vice versa.

[33] The enforcement indicator is the average of two EBRD (2000) series: the electricity collection rate and the social security tax collection rate.

[34] The *P* value refers to the statistical significance of the inflation coefficient in a bivariate regression against the size of the shadow economy as a percent of official GDP.

Table 5: The strength of the correlations between shadow activity** and its causes and effects, 1997.

Subcategory		Very signif.*	Significant*	Weak*	No effect*	Source
Macroeconomic	Unemployment	Positive				a
	Black market premium, 1990		Positive			f
	M2/GDP	Negative				a
	Period average ln(Inflation)		Positive			IMF
	Natural resource net exports/GDP			Negative		b
	Investment indicator	Negative				c
	FDI/GDP		Negative			a
	Central government balance			Negative		a
	Tax revenue/GDP	Negative				a
	Revenue indicator	Negative				c
	Tax level				None	d
	Enforcement indicator##	Negative				a
	Quality of public administration	Negative				e
	Budget subsidies				None	a
	Openness indicator	Negative				c
	Exports indicator	Negative				c
	Capital account indicator	Negative				c
Microeconomic	Stock market capitalization	Negative				c
	Stock market performance	Negative				a, b
	OBCA*COT indicator#			Negative		c
	Labor quality indicator	Negative				c
	Wage taxes				None	c
	Banking indicator	Negative				c
	Percent of bad bank loans				None	a
	Rule of law indicator	Negative				d
	Corruption indicator		Positive			e
	Large-scale privatization				None	a
	Hard budget constraint indicator				None	c
	Regulatory burden		Positive			d
	Private sector share of GDP			Negative		a
	Infrastructure indicator	Negative				c

Notes: See end of table.

Table 5 (continued)

Subcategory		Very signif*.	Significant*	Weak*	No effect*	Source
Socio-political	Human development indicator	Negative				UNDP
	Democracy indicator	Negative				e
	Civil Society indicator	Negative				e
	"Gini" coefficient				None	a
	Health & education/GDP				None	c

Notes: * *P*-value of bivariate regression: Very significant=$P<0.05$; Significant=$0.05<P<0.10$; Weak=$0.10<P<0.20$; No correlation=$P>0.20$. **MTE 1997 shadow estimate divided by GDP. # See footnote 35. ## See footnote 26. *Sources:* (a) EBRD (1999), (b) World Bank WDI database, (c) Sachs, Zinnes, and Eilat (2000), (d) Heritage Foundation, (e) Freedom House, (f) de Melo *et al.* (1995).

These results may be compared to those found in the literature. Kaufmann and Kaliberda (1996), for example, find that a rapidly growing unofficial economy is consistent with a high degree of bureaucratic discretion, civil war, undeveloped market institutions and enforcement mechanisms, a low degree of economic liberalization, a high tax burden, and macroeconomic instability. This explains why the shadow grew dramatically in Georgia and Ukraine.

5.4   The effect of the shadow economy on domestic competition

One of the major benefits of switching to a market economy is the increased potential for long term economic growth. This effect is due to the increased efficiency in resource allocation of a market economy. This efficiency property is in turn primarily due to the harnessing of the forces of competition under stable rules of the game (or a level playing field). It is thus appropriate from a policy perspective to consider the effects on competition of the presence of a shadow economy. Therefore, in this section and to the extent data permits, we examine the nature of competition in the presence of a shadow economy. We look first at the impacts on domestic competition and then on a country's international competitiveness.

For the sake of analysis, we can segment domestic competition issues into three aspects, competition within the shadow economy, competition between the shadow and official economies, and competition within the official economy. To evaluate the impact on competition and beyond, it is helpful to use a framework based on the relationship between competition on the one hand and market structure and conduct on the other (see Scherer 1979).

Recall that we view the various forms of government failure as the prime stimulants of the growth of a shadow economy in the first place. The growth of the shadow economy then has an impact on the market structure of the economy. We may associate the market structure of the economy with market (or firm) conduct. The changes to a market's structure and conduct as a result of shadow activity affect the economy's performance. They do this by affecting allocative efficiency, resource use, equity (income distribution), rate of innovation and technical progress. Note that these changes not only affect the goods markets but also the markets for labor and capital. We now take a closer look at how the presence of a shadow economy affects market structure, conduct and, ultimately, performance.

Effect of shadow economy on market structure: Here we take market structure to include the issues of firm size, sectoral output composition, type and degree of integration (vertical or horizontal), and ownership. Let us look at each in turn.

Figure 8: The shadow economy and the use of local currency, 1996-7. Source: EBRD.
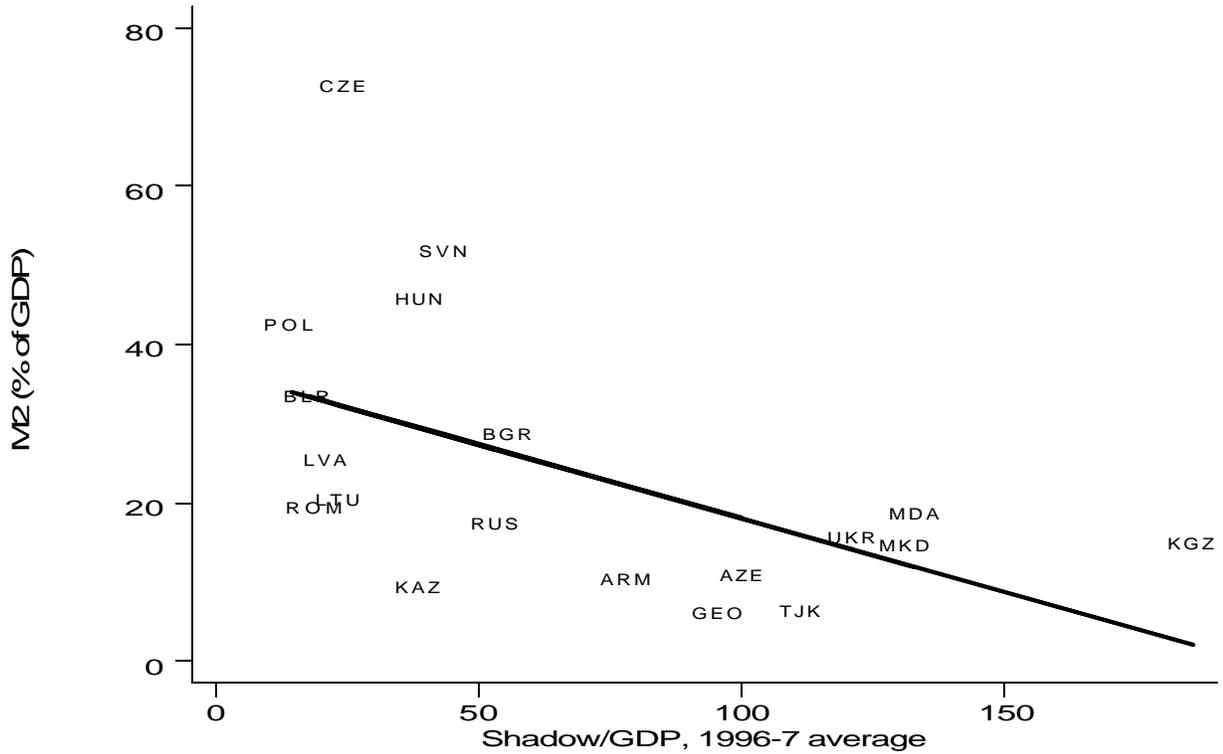
Figure 9: The capital markets and the size of the shadow economy, 1996-7. Source: EBRD, WDI.
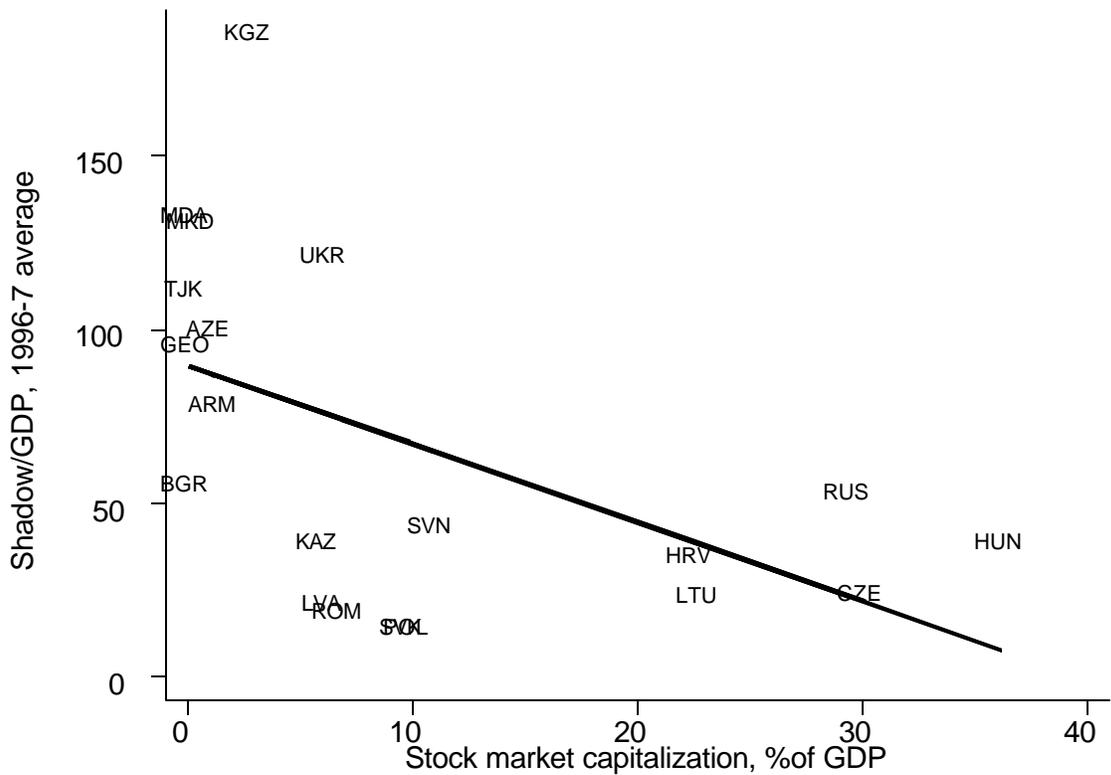
From a theoretical standpoint we have reason to believe that the presence of the shadow economy may affect firms depending on their size. First, small firms may find it easier to hide than larger firms. Being in the shadow, however, may act as a barrier to firm growth, making it more difficult for a small firm to graduate into a medium-sized firm. On the other hand, there is also evidence (Boycko *et al.* 1995; Kaminski 1996) that large registered firms engage in a substantial proportion of shadow economy activity. In other words, they declare less than they produce, either on purpose or due to stealing by management and workers. For these reasons we may expect medium firms to engage less in shadow activities. In economies where being in the shadow economy is beneficial, we would therefore expect the share of medium firms to be lower the larger the shadow size.

There are several reasons to expect that the composition of sector output would be related to the size of the shadow economy. First, the consequences of being in the shadow economy limit access to some services (such as banking or capital markets) more than others so that sectors whose activities require these inputs will tend to have a smaller shadow presence. Second, the ability to engage in shadow activities changes the relative profitability of entry. Thus, new firms may be attracted to start up in some sectors rather than others. Third, since the presence of the shadow economy is associated with more small-firm activity, sectors that rely on economies of scale may produce less output than otherwise. Sectors that might expand under a larger shadow economy might be agriculture and those most related to services, such as tourism, construction, foreign exchange trading, and import/export trading (especially for consumer goods). These tendencies are supported in Table 5 since the output share of industry is negatively correlated to the size of the shadow economy.

The issue of ownership contains three dimensions. The first relates to capital structure, namely, whether firms finance themselves out of debt, equity, or retained earnings. We hypothesize – and the correlations of Table 5 support – that economic activities are less able to take advantage of capital market and bank financing if they are in the shadow rather than in the official economy. In fact, access to these services is one of the "benefits" of being in the official economy. We would, therefore, expect firms operating *wholly* in the shadow to depend on own-financing, i.e., retained earnings and capital brought by the individual owners and their extended family. For those that operate in both official and shadow economies – and here we believe we are only talking about larger firms – it may be possible that investment for shadow activity comes from a cross-subsidy as firms borrow (from probably state-owned banks) for purportedly official activity. We further speculate that it would be harder to use capital market financing for shadow economy activities due to the usually stronger regulatory environment that accompanies better functioning capital markets. In summary, we expect to see less equity and more debt financing for larger firms and little outside financing for smaller firms, the greater the presence of the shadow economy.

The second aspect to ownership is the public-private divide. Since the state usually does not own small firms, this issue is most likely relevant for large firms only. Theory pulls us in two directions in this regard. On the one hand, private firms are better profit seekers than public ones so that to the extent that the firm has a policy to operate in the shadow economy (e.g., evade taxes) one would expect large firm shadow activity to be associated with private over state ownership. On the other hand, to the extent that large firm shadow activity results from opportunistic behavior (e.g., stealing) of management and workers – something that would be less likely due to the stronger governance of private firms, then we would expect greater large firm shadow activity to be associated with state over private ownership. Table 5 found no strong

bivariate correlation between private sector share of GDP and the presence of shadow activity, nor did we find any correlation with the degree of large-scale privatization. On the other hand, the Sachs, Zinnes, and Eilat (2000c) measure of privatization effectiveness, (COT*OBCA)[35] was strongly negatively correlated to the size of the shadow economy. This suggests that countries with governments, which were able to privatize *and* develop the strong governance regulatory environment, provided fewer causes to leave the official economy and, therefore, exhibited lower levels of shadow activity.

The third aspect to ownership relates to foreign participation. We believe that foreign investors, regardless of whether they purchase a firm or undertake a greenfield investment, strictly operate in the official economy due to their greater visibility and greater risk aversion. Moreover, any equity participation would necessarily be in a firm that is registered and, therefore, official. The presence of a large shadow economy signals to foreigners the severity of the factors that lead to a big shadow such as corruption and bureaucratic over-regulation. This signal plus the need to compete against firms that operate in the shadow and do not pay taxes or comply with regulations, may deter entry by foreigners as well. This is borne out in Table 5 where FDI is negatively related to the size of shadow activity.

Effect of shadow economy on market conduct. While market conduct normally includes such issues as pricing (predatory or discriminatory) and other kinds of restrictive market practices, legal or otherwise, in a transition economy context we may wish to include exercise of political (and ministerial) connections as well. The influence of the shadow on conduct ultimately depends on whether shadow activity originates from firm policy (say to evade taxes) or from governance failure (i.e., principal-agent problems from employees stealing firm output). It is also important to distinguish between small firms that operate entirely in the shadow (and therefore chose activities that do not require high levels of investment) and large firms that can tap official sector sources of capital. The most unambiguous hypothesis is the likelihood that investment is lower in shadow activities due to the increased risk of operating unofficially. This is in fact borne out in Table 5 as investment intensities are higher where shadow activity is lower. Lower levels of investment may lead to less aggressive pricing (less need to recoup investment), and may decrease the incentive to engage in predatory behavior.

To the extent that firms strictly have a policy of parallel activity (as opposed to stealing by employees), there would be an advantage in maintaining the vertically integrated structures of the communist period. This may make it easier for the firm to hide its activities.

As mentioned earlier, the presence of large shadow sectors generally leads to a smaller foreign presence and therefore a lesser threat of competition from the entry of foreign firms. This leads to higher prices. In addition, in case of a price war that may occur after the entry by foreign firms, domestic firms may be able to "cross-subsidize" their official activities with shadow activity profits – something we do not expect foreign firms to do. Thus, the existence of parallel opportunities for official firms can act as a credible threat deterring entry. Only when foreign firm efficiencies are so great (or domestic prices are so high) will they risk entry.

Finally, considering small-firm competition, for many service sector activities it will be hard for small firms in the official sector to compete (unless licensing is required) with small firms in the shadow. It is also possible for smaller shadow firms to grab market share from larger

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[35] COT is an indicator of the degree ownership has moved from public to private hands (change of title) and OBCA is an indicator of the quality of the regulatory environment for share ownership and corporate governance.

official firms where the latter is subject to burdensome regulation and economies of scale are not substantial.

Impact of market structure and conduct changes on performance. As mentioned above, there are several useful measures of the impact of competition (or lack thereof) on economic performance. Let us address each one in turn.

The characteristic of a market economy to use prices to signal economic scarcities and thereby attract resources is one of its great strengths. This characteristic is facilitated when firms are "atomistic" price takers[36] and have little market power. In this case the deviation from marginal cost pricing is limited, deadweight loss is small and the market tends toward allocative efficiency. For sectors that are amenable to shadow economy activity, the resulting deviation from competition may affect allocative efficiency. Furthermore, if shadow activities are more prevalent in some sectors than in others (e.g. service sectors with low economies of scale, agriculture, or construction), this causes a shift in the composition of economic output, something that will also affect the allocative efficiency of the economy. Moreover, If the shadow economy means that smaller firms engage in more economic activity than otherwise then activity may not be occurring at the most efficient economies of scale. Another source of loss of allocative efficiency comes when operating in the shadow reduces exchange between firms. Among the reasons for this are the weaker property rights protection for shadow firms - and the lack of availability of contracting mechanisms in particular. This reduces the amount of intermediation in the economy and, hence, specialization. Specialization is one of the greatest sources of efficiency gains.

The source of shadow labor will also impact allocative efficiency. If shadow workers reduce their activity in the official sector then the impact on resource use depends on the relative efficiencies of the two sectors (taking into account regulatory burden and loss of tax revenues). If the worker were unemployed, then the shadow economy unambiguously improves efficiency.

The shadow economy can also have an effect on "X-efficiency"[37] or resource use. Without competition, firms may be under less pressure to use resources efficiently. Clearly this was the *sine qua non* of production during the years of communism. The impact of the shadow economy on market structure may affect resource use through several channels. They may reduce the size of the medium-sized firms and this may lead to less pressure on the large firms. If entry barriers make entry of foreign firms difficult, and trade liberalization is limited, then the remaining large firms may not produce at the lowest costs.

As discussed in section 5.1 the shadow economy can affect income distribution as a result of reduced tax revenues. But changes in market structure and conduct due to shadow activity could affect income distribution as well. Nevertheless, as shown in Table 5, we were not successful in detecting a relationship between the size of the shadow and our measure of income distribution (the "Gini" coefficient). There are several possible reasons for this. First, income distribution data, especially in the transition region, are notoriously noisy. Second, the shadow has two opposing effects on income distribution. On the one hand it provides an important source of jobs. On the other hand it reduces the tax base to pay for social transfers. Also, if shadow activities are associated with stealing from state firms or with anticompetitive conduct, they may further increase inequality.

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[36] Individual firms face a horizontal g demand curve for their outputs.
[37] X-efficiency addresses the question whether a firm produces the maximum output for a given amount of inputs.

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With the exception of entry considerations, the characteristics described so far are for the most part 'static'; they do not depend on time. However, one of the strengths of a competitive economy is its ability to innovate, a dynamic consideration. While innovation may be as simple as the design of new products, in this era it is primarily a matter of <u>technical change</u>. Competition is an important driving force for innovation. The presence of fewer foreign firms (as a result of the forces leading to the shadow economy) reduces competition directly and indirectly (via demonstration effects) and therefore the rate of technical change. On the other hand, stealing by management and workers as part of the shadow economy may be a more profitable activity than risky innovation. Finally, the fact that shadow economy firms invest less would lead us to expect lower rates of production innovation *in* shadow activity than if the *same* activity had taken place in the official sector. We illustrate in Figure 10 the consequences of these forces by the negative relationship between the size of the shadow economy and a country's international competitiveness score on technology preparedness.

5.5 The shadow economy and international competitiveness

For most of the countries in transition the international private sector plays a critical role in the development of a successful market economy. Foreign markets provide a ready source of demand for domestic firms at a time when domestic demand is weak. Imports provide a source of high quality inputs and capital goods that allow for plant modernization and product improvement. Imports also provide a set of price anchors as domestic prices may still be adjusting after price liberalization. This is important for allocative efficiency. Imports can also provide a source of competition at a time when domestic market structure is still oligopolistic or monopolistic. Foreign participation in the form of direct investment is also important in the creation of domestic competition. Finally, foreign investment in its various guises supplies a critical source of funds to supplement domestic savings when the country is in need of large amounts of capital.

To attract foreign participation in a competitive world, it is generally important for the country to be able to export. This requires attaining a satisfactory level of international competitiveness. In this section we provide a rough look at whether the existence of the shadow economy is associated with more or less international competitiveness. We would expect that the "bad" influences that the shadow economy has on the economy as described in section 5.1.1 would hinder international competitiveness while the "good" influences it has as described in section 5.1.2 would promote it. However, one would expect foreign firms to operate only in the official economy. Therefore, a greater foreign presence, *ceteris paribus*, may be associated with a relatively smaller shadow economy size.

Figure 10: The size of the shadow economy and the quality of technology, 1996-7.
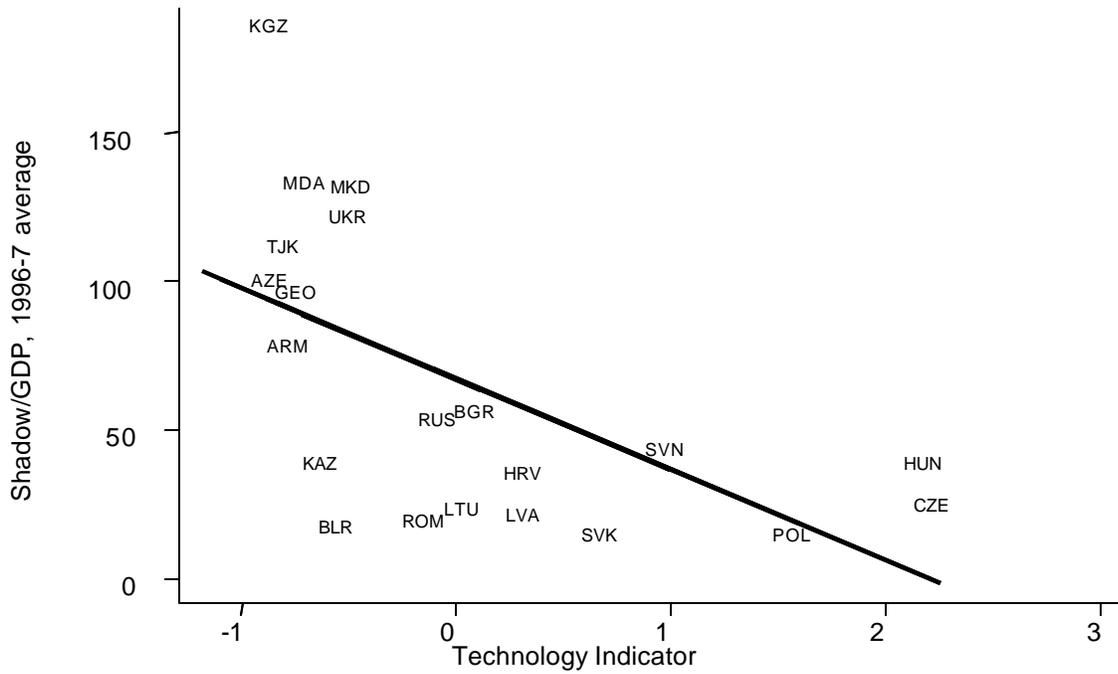
Source: Sachs, Zinnes, and Eilat (2000b).

Figure 11: The shadow economy and international competitiveness in 1997.
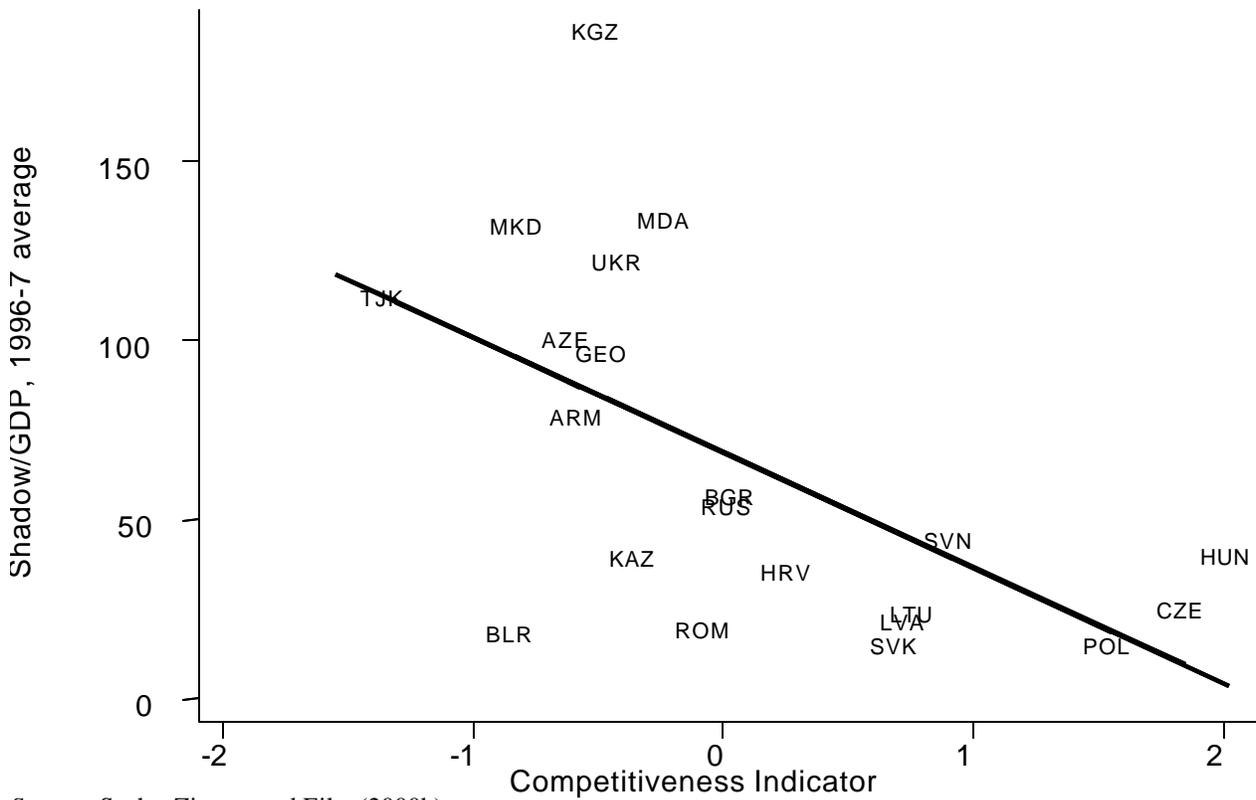
Source: Sachs, Zinnes, and Eilat (2000b).

We examine this question using some stylized facts as captured by the correlations between the size of the shadow economy and the Sachs, Zinnes, and Eilat (2000b) indicator of international competitiveness and its components. At the highest level of generality, we see in Figure 11 that a larger size shadow economy is associated with less international competitiveness. This result holds for each of the seven components that make up this measure.[38] This simply underscores the relationship between the existence of the shadow economy and its causes and effects. For example, the indicator components of good government and strong institutions not only capture two key prerequisites for international competitiveness, but also two key causes of the shadow economy when they are absent. Similarly, the component, well functioning markets, measures a characteristic that both promotes international competitiveness as well as increases the costs of moving into the shadow.

6 Implications for policymakers and donor assistance

Since countries in transition go through a systemic transformation,[39] an increase in shadow activity is unavoidable. In fact we have argued that during the most arduous part of the transition period, the presence of shadow activity actually can improve growth prospects. This is because it can improve income distribution at a time of austerity, provide a platform for *de novo* firm creation, and limit the impact of an out-of-date regulatory regime no longer in sync with the demands of a market economy. At the same time, we have seen that the continued presence of a shadow economy – and the government failures that constitute its causes – hinders long-term growth and international competitiveness.

Is the presence of a shadow economy an irreversible plague on a country's development? The results of Section 5.2 indicate that if institutional and regulatory problems can be addressed and improvements can be maintained, then one should expect an eventual turn-around of shadow activity. This reduction, however, is likely to be at a slower rate than the shadow's original growth. Turning to case study evidence, the survey performed in Ukraine by Kaufmann and Kaliberda (1996) asked shadow firms what would prompt them to move to the official sector. The popular response was the removal of administrative controls in trade and foreign exchange, a stable and moderate tax system, and low inflation. Around 30 percent said they would become official within one year of a serious economic liberalization and tax reforms, 20 percent said they will become official after two years, and 33 percent said they will become official after a longer period of time. Only 15 percent said they would not become official even after these reforms. This evidence suggests that, though the shadow is hard to remove, it is still reversible.

Building upon our analysis of the shadow economy and the channels of its causes and effects, in this section we develop some tentative policy recommendations. We then consider the implications for donor assistance.

6.1 Growth-enhancing policies and the shadow economy

Section 5 highlighted the growth performance costs of the institution failures that lead to shadow activity. Have governments been sensitive to this fact? In Sachs, Zinnes, and Eilat (2000a), we examined nine policy areas to see what government priorities were. These data may be correlated to the size of shadow activity. If a government were sensitive to the causes or impact of shadow activity, then we would expect to see higher government priorities in policy areas that would

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[38] See Sachs, Zinnes, and Eilat (2000b) for a detailed description of these subindicators.
[39] Kornai (1994) coined the term "systemic transformation."

attenuate shadow activity. Table 6 shows that this is not generally the case, with one notable exception. There is no evidence across countries that in situations where there was greater shadow activity, governments placed a greater priority on reforms that would also have a shadow-reducing impact. The exception is reform of the tax code and administration. This suggests that governments seem to be missing the importance of reducing shadow activity or see such activity as a one-dimensional problem: tax evasion. Their response to shadow activity, therefore, has been to improve their revenue-generating capacity through tax reforms.

Table 6: The statistical significance of government and donor policy priorities as they relate to shadow activities, 1990-1997.

Policy area	Government	Donors
Small-scale privatization	None	None
Strategic privatization	None	Positive
Enterprise restructuring	None	Positive
Stock market reform	None	Positive
Judicial reform	None	Positive
Tax reform (including administration)	Positive	None
Social safety net reform	None	None
SME promotion	None	None
Trade liberalization	None	Positive

Sources: Sachs, Zinnes, and Eilat (2000a) for priorities; section 4.1.1 for shadow activity.

In the present section we propose a number of policy recommendations geared toward facilitating economic recovery and, eventually, supporting long-term growth prospects. The challenge is to design strategies and supporting policies that reduce the size of the shadow economy by mitigating the "justified" causes (e.g., bad regulation, bureaucratic corruption and inefficient provision of public goods) of shadow activity while improving the institutions and policies to attenuate the "unjustified" causes (weak enforcement, lack of rule-of-law traditions). The diversity of the linkages between the shadow economy and economic growth require that we organize our policy recommendations along three lines: actions with multiple benefits (shadow and nonshadow), actions that directly target the shadow economy, and actions whose effectiveness is changed by the presence of shadow activity.

6.1.1 Actions with multiple benefits

This category of recommendations concerns policy actions that are good for a variety of reasons, with decreasing the size of the shadow economy being just one of their by-products. These are the more straightforward cases, since they usually have only positive effects. Among these are the following:

Further liberalization. [40] In countries with a sizable unofficial economy, the rationale for market liberalization is further strengthened. Liberalization of official markets reduces costs of undertaking official business, providing an incentive to become efficient. The liberalization effort has to be bold and credible. Thus, it has to be radical and not gradual or partial. Removal of price ceilings and export quotas is necessary but not sufficient. Deregulation at the micro and

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[40] See also in Kaufmann and Kaliberda (1996).

regional level is required in order to address issues of harassment and costs of discretionary enforcement of old regulations and laws. This is *not* to say the less regulation the better, a theme we return to below.

Macro-stabilization. [41] Lax budgetary and monetary policies and the resulting inflation raise the benefits from unofficial activities and reduce the risks and costs. They increase the costs of operating officially. They distort financial accounting, and make it harder to get caught for tax evasion. They also induce a transfer to foreign currency, which is associated with unofficial economy and capital flight. Conversely, attracting unofficial activities back to the official may assist macro stabilization.

Foreign exchange management. A system of dual exchange rate or foreign exchange rationing (for example, exchange being authorized only to a restricted number of government bureaus or banks) promotes the use of unofficial channels. This, in turn, may promote shadow activities in general since, if a firm has to hide its foreign currency activities, it may be better off hiding its activities altogether. It may also impair balance of payments and macro management. The policy implications may be that there is additional benefit from exchange rate unification.

Better regulation. A primary cause of shadow activity is an attempt to avoid predatory and obstructive regulations and their associated licensing and bribe fees. Much regulation on the books in transition economies has been written without regard for feasible implementation, for ideological reasons, or for an economic system based on central planning. The current tendency to import unchanged OECD regulatory models into countries without the administrative traditions to implement them is problematic and leads to two quandaries.

First, creating, implementing, and then complying with new regulations takes time. Thus, creating a simplified system for an intermediate period may end up being costly and confusing. On the other hand creating a modern regulatory system may require government administrative skills not presently feasible, thereby leading to corruption and increased shadow activity. Second, there is a tension between corruption and efficiency concerning regulatory discretion. On the one hand regulatory discretion may lead to abuse and corruption. On the other hand regulations that remove all regulatory discretion and treat all cases identically is likely to make for an inefficient system. These conflicting tendencies need to be balanced in the search for an effective regulatory system.

Finally, there are several simple regulatory reforms that can lessen the regulatory compliance burden. One such mechanism is the instrument of "presumptive permitting." While there are several variations of this theme, it basically operates as follows. A firm has a statutory obligation to file a permit application. The regulatory authority then has a statutory number of days to respond or the firm is *presumed permitted.* This has several benefits. First, it prevents the firm from becoming de facto illegal by operating without a permit in the case that the regulatory agency is understaffed and is unable to get to the firm's permit application in a reason period of time. Second, it lowers the cost of permitting since the regulatory authority can prioritize applications and spend scarce staff time only on those that require serious investigation. Third, it reduces the temptation for petty bribery. A variation on this theme is to stipulate a limiting set of conditions whereby a permit is required. The firm then determines on its own if it meets the conditions. If it does, it incurs a liability if it does not file; if it does not meet them, then it avoids the hassle of filing in the first place.

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[41] See also in Kaufmann and Kaliberda (1996).

Institutional strengthening. It is not enough to design good regulations in order to reduce regulatory avoidance as a reason to operate in the shadow. Three other aspects must be addressed. First, civil service reform must be begun. This requires retiring the old-style bureaucrats that see enterprise control (and corruption) as their *raison d'être*, hiring better educated replacements using a system based on objective testing and other relevant job criteria, improving management structures and incentives, and improving civil service salaries. Second, the new staff needs to be trained together with general capacity building. Carrying out this second step without also implementing a civil service reform may be self-defeating in the long run. Providing ministry staff with marketable skills while paying them a below-the-market salary leads them to "take their training and run," leaving the ministry as weak as ever. Third, imposing a regulatory mandate on an underfunded regulatory body is a recipe for inefficiency, rent-seeking, and corruption – all leading to greater shadow activity. Unfunded regulatory mandates should be discouraged. Any law that adds to a regulatory body's responsibilities should also identify feasible and sufficient funding sources. This is not always easy since there will be strong (and necessary) forces at the ministry of finance to reduce the number of special funds and earmarking as part of a budgetary reform.

Oversight, transparency and public participation. A way to improve regulatory perform-ance and control regulatory discretion without losing its potential benefits is to improve over-sight mechanisms. While this is especially true for tax collection authorities, it is also true for any agency that provides operating licenses. Oversight as well as responsible regulatory effort is increased with regulatory transparency. Statutory requirements should be increased to provide the public with information regarding the objects of regulation. This will also improve the impact of another oversight mechanism: public participation. While there will be a tendency in transition country regulatory bodies to see public participation as an unnecessary time-consuming process, it should ultimately professionalize the regulatory process, reduce arbitrary regulation, and curtail corruption. All of these effects will have a positive impact on official economic activity as well as attack key factors pushing firms into the shadow.

Bank privatization. One factor that would encourage a firm to remain official is the avail-ability of banking services. Therefore, banking sector privatization and restructuring that would improve such services through increased competition, financial deepening, and increased intermediation will tend to reduce shadow activity. When banks are privatized, firms in need of credit cannot rely on political ties and must make their activities more transparent, which tends to reduce their shadow activities. Finally, bank privatization should permit foreign firms to enter the market. They tend to be less open to bribery. A similar set of arguments can be made for capital market reforms and especially the prudential regulation that such markets require.

Decentralization and better local public finance. These two topics are extremely complex and we will make no attempt here to list what to decentralize. Nevertheless, there are still some simple lessons to underscore. First, in a large country such as Russia, local administrations will be suspicious of revenue devices applied at the local level that are intended to raise funds for the central government. This is the case even if these funds are theoretically returned to the local level in the form of services or even grants. Localities may see transfer of resources to the central government level as a one-way-street and not cooperate much with their implementation. They may even tacitly encourage local shadow activity. Second, where possible, consumers of public services at the local level should pay local service providers directly without funds passing through the central government, which payers see as a black box. For these services the central government's role then becomes one of oversight. Third, decentralizing functions to the right

jurisdictional level can promote efficiency and oversight, besides better funding. These work to improve the quality of public services and therefore the benefits of operating in the official economy. For example, regulating the water sector is best done at the level of the river basin, not the territorial (political) unit.

Rule of law. As we have seen, government failures are what stimulate the growth of a shadow economy. These can be errors of commission (e.g., corruption, inappropriate regulation) as well as of omission. Key among this latter group is adequate protection of property rights (e.g., enforcement of contracts). A primary benefit of being official is access to the legal system. A dysfunctional judicial system, however, reduces the cost of such loss of access. This reduces the value of being "official" and, thereby, makes the benefits of operating in the shadow economy more attractive.

6.1.2 Actions that directly target the shadow economy

Clearly, most policy actions that strengthen economic growth of the official economy will have an effect of encouraging firms to move out of the shadow. The question is whether, in addition to these, there are actions policymakers could pursue whose primary objective would be to directly influence the size of the shadow. In this section we provide several types of actions that may be considered in this regard. We end the section with some implementation concerns.

Pay your bills. The use of barter facilitates shadow activity. Some governments, however, themselves use barter to pay for services when their tax receipts do not cover expenditure commitments. This sends the wrong signals to the private sector and ultimately creates an atmosphere that encourages operation in the shadow and reduces any stigma associated with it. To the extent that this leads the private sector to engage in further barter, the government's use of barter carries a negative hidden or unintended cost and therefore should be strongly discouraged.

Taxation. One of the main motivations of shadow activity is to evade taxes. Tax reform can directly address this. Such reform comprises several components. First, better administration would comprise better oversight mechanisms, tax compliance audits, and additional funding for more qualified staff and their training. Second, an improved tax code would address simplifying the number of exceptions and exclusions and would lower rates. One way to lower rates is to increase the tax base by using a greater diversity of tax instruments and by introducing a self-enforcing VAT (if one is not already in place). One example of a powerful tax reform is the computerization of customs, coupled by a reduction in the number of tariff categories. Finally, the country may wish to adopt the International Accounting Standards (IAS) and eventually require certified accounts (with a system of bonding accountants).

Better enumeration. Since the shadow by definition includes unrecorded activity, improved statistical methods and procedures by the national statistical office and its reporting agencies would improve the government's knowledge of the true state of the economy even if firms evade taxes. Another area for better enumeration concerns eligibility lists for social safety net benefits. These provide an incentive to operate in the shadow since a worker can then engage in "double dipping" by receiving, for example, unemployment benefits and a salary from a shadow firm.

Stricter, more strategic enforcement. Most penalties (with the exception of those carrying mandatory criminal offence) are so low as to be insignificant. Increase of penalties and evenness of application may increase compliance, though there are several important caveats to consider. The first refers to "exit" and is discussed below. The second refers to whether the regulatory

administration is up to the task of defending itself legally. Limited budgets generally mean that regulatory authorities lack the skilled lawyers and other expertise to match those that the private sector might muster in the event a penalty were very high. An additional enforcement tactic is to bring together the various different sources of information concerning economic activity that the government has at its disposal. The most obvious are tax data and reports from the national statistics agency. Other sources exist, such as water, telephone, and electricity registers. Comparing these can help auditors and inspectors identify shadow firm activity and aid in the development of compliance enforcement programs. Yet another successful approach is to develop regulations and compliance programs that are cost-effective. In the regulatory context this means that each additional unit of regulatory effort should be targeted on firms with those characteristics that lead to a maximum reduction of the transgression being controlled. Finally, a smaller shadow is only a good thing when it exists due to weak enforcement, not when it exists to circumvent inappropriate, unwieldy, and over-burdensome regulations that are not cost-effective. Thus, a policy to improve enforcement must go hand in hand with successful reform of the regulations themselves.

In addition to the above policies to address shadow activity, there are several general concerns that policy should take into consideration:

Market exit. The choice confronting a firm is not just whether to operate in the shadow or official economy. A firm may chose to stop operating and exit altogether. Here we should be careful not to "throw the baby with the bath water." Thus, in designing policies that directly attack the shadow, the government must be careful that the incentives push unofficial activities from the shadow into the official economy (desired) and not cause them to stop completely (undesired) or be performed with more social waste as the firm hides itself even further. For instance, a harsh punishment for tax evasion may scare a firm into declaring its activity, drive shadow activities even deeper into the shadow in order to avoid detection, or even cause the activity to be eliminated altogether. Moreover, the firm's response will depend on its sector, size, and ownership characteristics.

Policy complementarity and coordination. Once transition reforms have attained a certain level of momentum and quality, shadow activity is growth-reducing. As was pointed out, many of the policies described in the previous section are good for growth, with or without a shadow economy. Nevertheless, when weighing the costs and benefits of implementing these policies, greater recognition should be given of their benefits via their shadow impacts. Thus, for example, if the government is at a point of indecision on whether to privatize banks, recognition of the indirect benefits that this policy would have in reducing shadow activity may be sufficient at the margin to sway the government to accept the policy reform. Closely related to the complementarity of policy benefits is the need for policy coordination. For example, it is probably not productive to increase enforcement penalties until regulations and regulatory service efficiency improve.

Selective targeting. Many of the reforms listed above and in the previous section would be more cost-effective, cheaper to enforce, and cheaper to comply with if their applicability were more selective. Regulations and payroll tax obligations, for example, may wish to exempt small firms. Medium-sized firms may be subject to limited regulatory and payroll tax obligations, with only large firms subject to the full gamut of controls. Size need not be the important criteria. Other such criteria may refer to whether activity takes place in urban or rural settings. But it must also be taken into account that involving such criteria is costly since it increases the regulatory complexity.

Dynamic considerations. Some policies may be effective only if they are credible. Issues of time-consistency should be considered in particular. For instance, if the government announces a tax amnesty to be followed by a crackdown on tax evasion, the crackdown had better occur or the next time the amnesty will not be credible and firms will increase their tax evasion, expecting another amnesty to follow. A better policy would be policy coordination: announce a tax amnesty as part of a serious tax reform. This lowers the cost of returning to the official economy as it removes a (re-)entry barrier. Another even trickier dynamic issue concerns the question of precommitment and credibility. For example, when a firm is considering whether to enter the official economy, should the government let it know that the barriers to returning to the shadow economy are low? This would have two effects. It would make it less risky for a firm to "try out" the official economy and it would increase the pressure on the government to precommit to more sensible regulation and higher quality implementation and administration.

6.1.3 Actions whose effectiveness is changed by a shadow economy

Policies that are not directed towards the shadow and may not affect its size may still be affected by its presence. This affect can come from two routes:

First, policy mistakes may be made if they are based on distorted data. An example is policy that aims to reduce unemployment that is due to high official unemployment when the unemployed workers are actually employed in the unofficial sector.

Second, policy effectiveness may be directly affected by the presence of the shadow. For example, when a country decides whether to raise taxes, it may not know if it is on the upward sloping portion or downward sloping portion of the Laffer curve.[42] In countries with large shadow economies the risk of being in the downward sloping portion of the curve is particularly problematic. In this case, an increase in the tax rates shrinks the tax base not only because of its negative impact on the incentive to work, but also because it drives activities out of the official economy. Monetary policy and credit creation can also be less effective in the presence of a large shadow economy. This is because shadow activity transacts using barter or foreign currencies. Related to this is institutional development. For example, development of financial sector intermediation can be stymied due to the presence of a shadow economy. This occurs because shadow firms (or shadow activity within a registered firm) are less likely to qualify for these services.

6.2 Donor assistance and the shadow economy

Based on our analysis of channels of cause and effect, the size of the shadow economies, and various policies, we can develop donor recommendations on:

- How, if at all, does donor assistance encourage a shadow economy? What aid project or delivery strategies might minimize such negative impacts?
- What can donors do to reduce the negative impacts of a shadow economy? Should this be done directly (e.g., financing enforcement) or indirectly (policy assistance to reduce command-and-control regulations that lend themselves to rent seeking)?
- What are the implications of the shadow economy for project evaluation?

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[42] This bell-shaped curve relates tax rates to revenues collected. It illustrates that, to the left of its maximum, an increase in the tax rate increases revenues but, to the right of its maximum, an increase in the tax rate *lowers* revenues.

First we look at evidence regarding whether, historically, the shadow economy has influenced donor assistance. From a macro perspective we look at whether the total amount of technical assistance at the country level varies depending on the size of the shadow economy once the main determinants of the allocation of aid are accounted for. We then look at whether donors have been taking the shadow into account when setting their assistance priorities. Second we examine the linkages between the shadow economy and donor assistance. Here we describe the various modalities of donor assistance and how these can affect – both intentionally and unintentionally – the size and characteristic of the shadow economy. We then describe how the presence of a shadow economy can make it more difficult to develop aid strategies.

6.2.1 Evidence on the impact of the shadow economy on donor assistance

Let us exploit two sources of information from Sachs, Zinnes, and Eilat (2000a) to examine the evidence for influences of the shadow economy on the allocation of donor aid.

At the macro level, technical assistance may be influenced by many factors. Poorer countries as measured by per capita income (GDP_PC) should receive more aid than richer ones. Countries that are in regions of strategic importance (as captured by regional dummy variables, $Iclust_i$) receive more than regions that are not. Aid levels should also be affected by whether politics in the donor country favored more or less aid in a given year (captured by calendar year dummy variables, $Iyear_t$, $t=1990\text{-}1997$). Aid may also be affected by relative income changes such as the relative severity of recession (GDP_REL). Aid may also be influenced (especially recently) by the donors' perceptions of whether the aid will be used effectively. This may be related to what point in the transition a country is in (captured by the dummy variables, $Itrans_t$, $t=1\text{-}7$).

To begin, therefore, let us test for the relevance to donors of the presence of a shadow by looking at whether the size of the shadow economy (our MTE measure of the size of the shadow relative to official GDP) can account for the *unexplained* portion of aid-giving once the factors in the previous paragraph are taken into account. For this, the following regression was estimated, where the dependent variable is TAPOP, the total ODA technical assistance per capita received by a country in a given year (*t*-statistics in parentheses):

$$TAPOP \quad = \quad -77.7 + 0.91\ SHDGDP \ - \ 0.005\ GDP\_PC \ + \ 93.5\ GDP\_REL \qquad\qquad N=21$$
$$ (-4.3) \quad (6.9) \qquad\qquad (-3.3) \qquad\qquad (5.3) \qquad\qquad Adj.R^2=0.41$$

$$+ \quad \Sigma_i\ (e_i\ Iclust_i) \quad + \quad \Sigma_t\ (f_t\ Itrans\_t) \quad + \quad \Sigma_t\ (g_t\ Iyear\_9t)$$

This regression confirms the tendencies described above with strong statistical significance of all the key variables. In particular, we see that after accounting for the standard motivations for donor assistance, the residual donor assistance has responded to either the existence of a shadow or to the preponderance of its causes and impacts.

To illustrate just how strong this relationship is, we plot in Figure 12 unexplained TAPOP (i.e., the residual after accounting for the other standard explanations of aid allocation) against our measure of the shadow economy, SHDGDP.

Moving one step down in detail, we can also examine whether the donors set priorities that would address causes and impacts of shadow activity. This would be a further indication that donors were concerned, directly or indirectly, about the shadow economy. To do this, we return to Table 6 and the nine policy areas from Sachs, Zinnes, and Eilat (2000a) that we examined earlier in our discussion of government priorities in relation to the shadow economy. If donors were sensitive to the impact of shadow activity, then we would expect to see higher donor priorities in policy areas that would attenuate shadow activity. The table shows that, unlike the government, donors in general did set higher priorities in areas that would attenuate the size of the shadow economy. In particular, the larger the size of the shadow economy, the higher the priority donors placed on judicial reform (to strengthen the rule of law), capital markets, privatization and trade liberalization. What is curious is that tax reform, which was the target of the government's response to shadow activity, was not a donor response. One explanation is that donors simply observed that governments were already attending to the issue. Another possibility is that donors recognize the importance of tax reform and give it a priority before a shadow economy develops.

6.2.2   Linkages between donor assistance and the shadow economy

There are four areas where aid and shadow may be linked.

Project effectiveness. The existence of a significant shadow economy may impact the effectiveness of aid projects, depending on the delivery vehicle. The first vehicle is policy assistance and institutional capacity building. Thus, for example, since aid for capital market development flows through the government, the impact of the shadow economy on the effectiveness of such aid would be the same as its impact on policy itself.

The second vehicle is financing for infrastructure. Here, aside from the normal concerns about corruption, the presence of a shadow economy may mean that the smaller firms it includes may be ineligible to participate in the project. If one goal of the project was to involve them in the infrastructure construction, that project objective may not be met. Similarly, to the extent that the infrastructure can be accessed only by the official economy there will be fewer beneficiaries, and the shadow is bigger. Note, however, that in the long run, these additional benefits may influence the cost-benefit calculus that firms go through in deciding to leave or return to the official economy.

The third vehicle is direct assistance to civil society. To the extent that NGOs and other types of associations might represent shadow firms, then assistance to NGOs would have an added benefit in that it provides some "voice" to a group that, by its economic status, is disenfranchised.

Figure 12: The influence of the shadow economy on allocation of technical assistance, 1990-7.
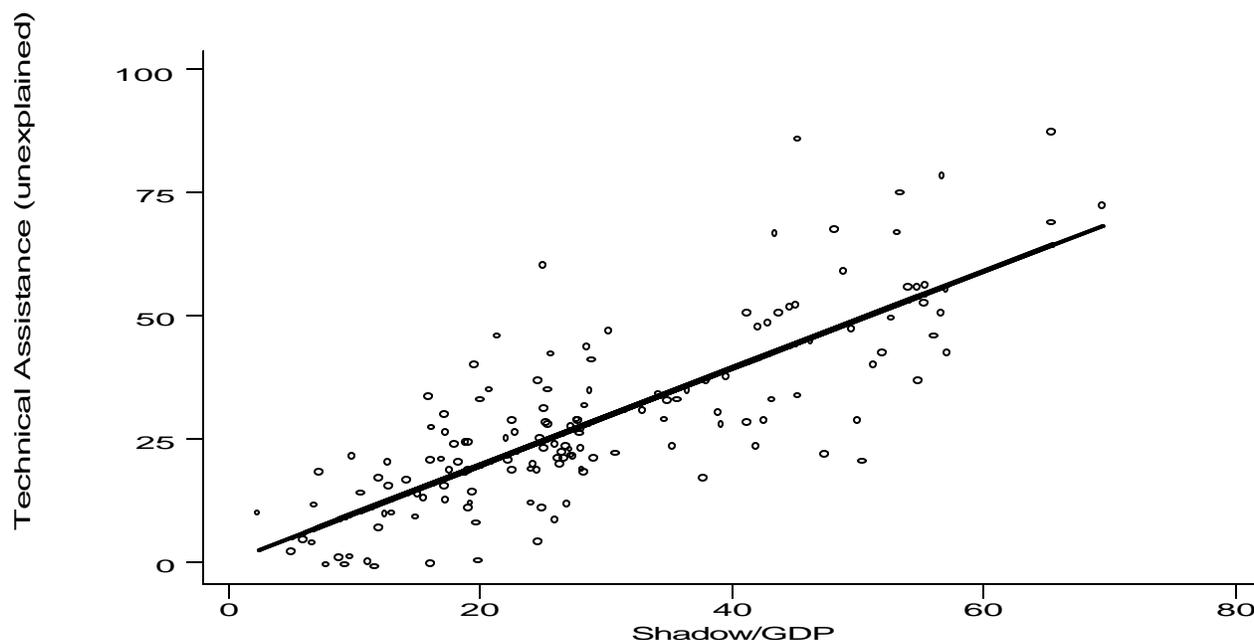
Finally, aid may provide financial and technical assistance support directly to enterprises. Again, small shadow firms will be less likely to benefit from such assistance, though its existence may encourage such firms to change their status. Moreover, SME projects that, for example, provide technical assistance to small firms to develop bank financing proposals may be less effective if many of the beneficiary firms are in the shadow and therefore find themselves excluded from banking services. In the case of large firms, the greater accountability that eligibility for aid requires may serve to reduce, at least while aid is flowing, the firm's shadow activities.

Choice of project. The choice of aid projects may be inefficient if built upon statistics that fail to fully capture the presence of the shadow economy. This leads to two possible types of inefficiencies. First, the aid budget may be misallocated between countries. Consider an example when more aid is given to high unemployment countries than to low unemployment countries. Then a country with high *official* unemployment but a large shadow (and therefore in reality *low* unemployment) may be allocated more assistance than a country with lower *official* unemployment but a small shadow. Second, because the presence of shadow activity can make aid projects less effective and harder to evaluate and since the amount of shadow activity is not uniform across economic sectors, the presence of a large shadow economy may lead to a misallocation of aid to projects within a country.

Unintentional effects of aid. Aid projects may unintentionally affect the size of the shadow economy. For instance, the policies mentioned in Section 6.1.1 have multiple benefits: they directly improve the official environment for economic activity but also reduce the benefits of operating in the shadow. The donor would, therefore, want to be sure to include the benefits associated with a reduced shadow in the determination of what projects to implement.

But sometimes the unintentional effects are undesirable. For example, technical assistance for strengthening regulatory or tax enforcement may have the unintended consequence of

pushing firms deeper into the shadow if such measures are not preceded by an improvement in the quality of regulation and its administration. Likewise, aid to sectors (or that generate demand for sectors) whose characteristics disproportionately attract shadow activity may have the unintended consequence of increasing the size of the shadow economy. Another undesirable effect is that some countries may underreport their official GDP statistics in order to increase the amount of aid they receive.[43] (Such misreporting would be captured in our shadow economy estimates.) Finally, it has been claimed that in some countries the existence of aid money can increase corruption and therefore contribute to the deterioration of morals in the country, both encouraging additional shadow activity.

Project evaluation. The evaluation of aid projects may be biased in the presence of the shadow economy. At the macro level, technical assistance policy support may appear to have a more modest growth impact if official GDP rather than TEA growth is taken as the indicator of success. Similarly, for donor assistance in support of the policies mentioned in section 6.1.1 any evaluation that ignored the positive impact on shrinking the shadow would understate the benefits of the aid intervention.

To conclude, we believe that not only should the donor community take into account the existence of the shadow economy for the reason mentioned above, but it can also support government activities that directly target its existence, as described in section 6.1.2. In doing so it should remember that shadow may have good effects as well as bad, and this is often related to the question whether the country is in an early phase of transition reforms or in a late one.

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[43] See Tanzi (1999) on this important issue.

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