VAT Accounts: Methodology and Experience

by

Michael Alexeev, Department of Economics, University of Indiana, Bloomington, US
Robert Conrad, Terry Sanford Institute of Public Policy, Duke University, Durham, US
and
Ilya Trunin, Institute for the Economy in Transition, Moscow, Russia

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Abstract

VAT bank accounts are a method employed in Bulgaria and considered in other transition economies such as Russia and Georgia. This administrative method is described and analyzed from an economic perspective in this paper. It is shown that VAT bank accounts, in general, do not have the characteristics often claimed in terms of compliance and application. In addition, the Bulgarian experience does not support the hypothesis that revenue yields are greater due to increased compliance. It is argued that the application of the VAT bank accounts should proceed with caution, if at all, in other countries.

1. Introduction

Comprehensive tax reform is an important element of economic transition from central planning to markets. Economies in transition (ET's) inherited tax systems that were incompatible with a market economy. Most countries wrote tax laws almost from scratch and in a short time period. Tax administration was underdeveloped and, in many cases, corrupt.[1] In addition, taxpayers were not accustomed to paying taxes other than through withholding, and in many ET's underground economies flourished at the beginning of transition. These factors combined with other transition characteristics, such as weak law enforcement, frequently changing laws, overall corruption and distrust of government, rapidly growing private sector, and general economic and political uncertainty, led to significant and perhaps growing tax evasion early in the transition period. In some economies, tax evasion was exacerbated by wrong approaches to tax system reform.[2]

Thus, tax evasion quickly became a serious problem in ET's, especially in the countries of the former Soviet Union.[3] Difficulties raising budget revenue combined with the persistent weakness of and corruption within the tax administration created strong pressures in some ET's to develop tax collection techniques that would be less dependent on the traditional tax administration methods and work almost automatically, enforcing compliance without heavy reliance on the honesty and skills of tax inspectors. One example of such techniques is the emphasis

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[1] See, for example, Ickes & Slemrod (1991), Tanzi (1991), and Faria (1995).

[2] Examples of bad tax policies included numerous exemptions and differential treatment of taxpayers permeating the tax laws, the use of turnover taxes, and the use of cash-based tax accounting instead of accrual method, even for relatively large taxpayers. The early introduction of such relatively difficult to administer taxes as VAT in countries with particularly weak tax administrations might have also been ill advised.

[3] In the CIS countries, the ratio of tax revenue to GDP declined from 24% in the early 1990's to 22% in the late 1990's. For the other East European ET's, the decline was from 34% to 32% (see Mitra & Stern (2002), p. 12 and Tables 1-4 in the Appendix of that paper).

on computerization of tax reporting, collection, and auditing.[4] Another and perhaps more interesting example is the scheme involving special VAT accounts that separate the flow of VAT payments from payment flows between taxpayers. This latter mechanism was introduced in Bulgaria in 2002 and has been considered in the Republic of Georgia, Russia, and Ukraine.[5]

In our paper, we will describe the VAT accounts mechanism, discuss the apparent motivations for introducing it, analyze the Bulgarian experience, and examine its likely costs and benefits for other ET's. In addition, we will discuss some conventional alternatives to VAT accounts in fighting VAT evasion.

Our view of the VAT accounts scheme is negative. We argue that prior to the introduction of special VAT accounts, Bulgaria had had an inefficient system of VAT administration that imposed high costs on the complying taxpayers and was a factor in generating evasion. That system was unsustainable and had to be reformed. Relatively speaking, the changes in Bulgarian VAT administration that took place concurrently with the VAT accounts scheme represent an improvement, particularly for large enterprises and exporters. An improved system, however, does not imply that VAT accounts represent the best, or even a good, mechanism to administer VAT in

[4] While we believe computerization can be very helpful in improving the efficiency of taxation, excessive reliance on it may be misguided and expectations are sometimes too high. In many areas of tax collection computerization cannot substitute for effective conventional tax administration.

[5] The Georgian government appears to be still considering the scheme; Ukraine has implemented the equivalent of VAT accounts for selected enterprises; and the Russian government decided not to implement the VAT accounts for the time being, but left open the possibility of introducing them later.

Bulgaria or elsewhere. VAT accounts deprive enterprises of significant working capital and impose large compliance costs on taxpayers, particularly smaller ones, resulting in distortions favoring large enterprises. In addition, VAT accounts are likely to increase the tax administration workload relative to a conventional VAT system; they provide incentives for administering VAT on cash basis, and do not address many tax evasion opportunities. At the same time, we recognize that the size of administrative and compliance costs of the VAT accounts mechanism, the effect of this mechanism on overall tax compliance, and government revenue relative to the pre-reform situation in a given economy are empirical issues not easy to evaluate.

We also argue that the costs of VAT accounts per unit of value added in economies larger than Bulgaria may be even greater if the number of taxable transactions in the economy increases faster than its GDP, and if the administrative and compliance costs of VAT accounts per transaction do not decline too fast.

The rest of the paper is organized as follows. In the next section, we describe the VAT and discuss the common problems with administering it. The description of Bulgaria's VAT accounts mechanism and the discussion of the initial experience with it are presented in Section 3. Section 4 examines the potential effects of the VAT accounts that were proposed for Russia. Section 5 is devoted to the more conventional approaches to fighting the types of tax evasion that VAT accounts are supposed to prevent. Conclusions are contained in the last section.

2. VAT and Its Administration

Over the last several decades VAT has become the second most important tax in terms of revenue in the

OECD countries after personal income tax (excluding social security contributions).[6] In most ET's, VAT was adopted early in the transition and quickly became one of the most important taxes there as well. Early in the transition, VAT collections constituted on average 28.1% and 24% of all tax revenue in the CIS economies and in the Central European and Baltic countries, respectively. For comparison, the corresponding share in the European Union countries was 17.8%.[7]

In economic intent, VAT is virtually identical to the retail sales tax, but the administration of VAT is quite different. Instead of collecting the tax only at the point of final sale, VAT is collected in stages along the chain of production of goods and services. An example in Table 1 demonstrates how VAT works. Firm A produces its output using only labor and existing capital, and sells it for 150 to firm B, for which A's output is the only taxable input. Firm B then sells its output to a non-VAT taxpayer such as an individual consumer. Assuming a 20% VAT rate, Firm A collects Firm B's VAT liability of 30 on an accrual basis and does not have any credits for VAT accrued on inputs, resulting in net VAT due of 30. Firm B collects a VAT of 45, has a credit of 30 for VAT it accrued on inputs, and pays 15 to the government. The total VAT due by both firms combined is 45 or 20% of the final output value of 225.

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[6] The unweighted share of taxes on general consumption (i.e., essentially VAT for most OECD countries) in overall tax revenues of OECD countries in 2001 was close to 18% (OECD (2003), Table C, p. 21).

[7] Mitra & Stern (2002), p. 10.

Table 1. – An Example of VAT mechanism
(VAT rate is 20%)

	Firm	***A***	→	***B***
1	Transactions			
2	Sale	150.00		225.00
3	Purchase	0.00		150.00
4				
5	VAT Accounting			
6	Output VAT	30.00		45.00
7	Input VAT	0.00		30.00
8	VAT Due	30.00		15.00

The multi-stage nature of VAT and the use of invoices to justify credit claims provide some defenses against evasion relative to a retail sales tax, if administration is reasonable. Even in developed countries, however, VAT evasion occurs and a number of different VAT evasion schemes have been observed. The most important evasion schemes include: (1) hiding or understating retail sales via cash transactions; (2) claiming deductions for ineligible goods or services; (3) falsifying invoices to claim fraudulent credits for VAT paid to suppliers; (4) using false exports, where the goods claimed to have been exported and, therefore, eligible for zero rate either do not exist or are diverted to the domestic market; (5) claiming credit for VAT paid to a fly-by-night firm that disappears without remitting the tax to the treasury.[8] The prevention of this last scheme appears to have been the main officially stated goal of VAT accounts in Bulgaria and elsewhere. The next section describes the VAT accounts mechanism as it has been implemented in Bulgaria.

[8] See, for example, Tait (1988) and Agha & Haughton (1996). A study quoted in the latter source indicates the first two schemes were the most popular types of VAT evasion in France in the 1980s.

3. VAT Accounts in Bulgaria

Bulgaria introduced VAT in 1995. A single 20% rate is applied to a relatively broad base[9], and the standard destination basis accrual invoice-credit system is employed. Almost 90% of reported VAT revenue accrues at the time of import. It is common for a significant proportion of reported VAT to accrue at the import stage, but Bulgaria is a rather extreme case. Accrued revenues from domestic sources have been negative in some months because of refund claims (both domestic and export). VAT revenues in both 2001 and 2002 were approximately 8.3% of GDP.[10]

Common evasion schemes, such as false invoicing, fly-by-night firms, and false exports were seemingly widespread in Bulgaria in the late 1990's – early 2000's. The government, concerned about the negative revenue effects of tax evasion, tried to combat evasion via fly-by-night firms by tracing transactions down the value added chain (almost on a transaction by transaction basis) to determine if appropriate VAT had been paid at each point in the process. A regulation promulgated in 2000 permitted the tax administration to disallow credit claims for otherwise legitimate transactions if fraud was deemed to have occurred at a lower, or subsequent stage, in the production and distribution chain.[11] This rather unusual

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[9] Exemptions are relatively few. For instance, most foodstuffs are included in the system. The VAT rate was reduced from 22% in 2000; see *Economic Policy Review*, Issue 23, Sep. 2003, p. 4.

[10] Information provided by the Bulgarian Ministry of Finance.

[11] The information about the regulation comes from our private conversation with the officials of the Bulgarian Ministry of Finance. The legal basis for this regulation is not clear. Courts in most countries would restrain a tax administration from using such methods. Even if the courts are not effective, the taxpayers in most countries would be likely to resist such regulation, so much that the legislature would be under great pressure to nullify the tax administration's action.

approach was used even though there was little evidence of abnormally low VAT collections in Bulgaria.[12]

An example provided in Table 2 illustrates the implication of the regulation discussed above.[13] Firm C is a fly-by-night firm and all firms, with the possible exception of Firm D, are honest taxpayers. Firm C purchases from Firm B and resells to Firm D. Firm C collects VAT from Firm D then disappears, stealing the VAT of 22.50. Suppose the tax authorities audit Firm F. Apparently, the tax authorities could delay Firm's F credit (even after confirming the transactions between Firm F and Firm E were legal) until transactions were traced back to A through D, and perhaps other firms, down the value added chain. This delay alone could result in lost working capital for several months because Firm F would have to pay the VAT of 227.81 while the credits were withheld pending audit results. Suppose the audit results indicated fraud might have taken place in the transaction between Firms C and D. According to the regulation, it was then possible for the authorities to deny Firm F's credit even though both Firm E

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[12] To make a rough comparison between the effectiveness of VAT collection in Bulgaria and other countries, we employed the following approach. Using cross-sectional data for 30 OECD countries, we ran the regressions of the share of VAT revenue in GDP on the VAT rate and some control variables. We then compared the values predicted by the regression and the actual collections. The regression results are presented in the Appendix. Bulgaria managed to collect relatively large VAT revenue given the VAT rate. Note, however, the overwhelming share of VAT revenue collected in Bulgaria comes from VAT on imports, while the described tax administration approach was apparently aimed at combating tax evasion in the domestic and export transactions.

[13] This example is for illustrative purposes only. Actual fraudulent schemes can be more complicated.

and F are honest taxpayers and neither honest firm knows of the Firm C's existence or disappearance.[14]

Table 2. – Example of Fly-By-Night Evasion Scheme (Firm C is a Fly-By-Night Firm)

	Firm	***A***	→	***B***	→	***C***	→
1	Transactions						
2	Sale	150.00		225.00		337.50	
3	Purchase			150.00		225.00	
4							
5	VAT Accounting						
6	Output VAT	30.00		45.00		67.50	
7	Input VAT			30.00		45.00	
8	VAT Due			15.00		22.50	
9	VAT Paid	30.00		15.00		0.00	
10	Amount of Theft					**22.50**	

(continued)

	Firm	***D***	→ ***E***	→ ***F***
1	Transactions			
2	Sale	506.25	759.38	1,139.06
3	Purchase	337.50	506.25	759.38
4				
5	VAT Accounting			
6	Output VAT	101.25	151.88	227.81
7	Input VAT	67.50	101.25	151.88
8	VAT Due	33.75	50.63	75.94
9	VAT Paid	33.75	50.63	75.94
10	Amount of Theft			

[14] The amount of credit denied is not clear. The amount stolen is 22.5 in the example and it might have been the case that the full 75.94 credit claim could have been denied. In addition, it is not clear what the tax authorities did with transactions between D and E. It might have been possible for the tax authorities to initiate a new audit of Firm E and determine that the credit claim of 50.63 was also tainted.

Taxpayers concerned about the auditing procedure described above proposed alternative control methods that would have provided some assurance for taking legitimate credits. The VAT bank account system was one suggested alternative, and it was ultimately selected. The system was introduced on a voluntary basis in July 2002 and on a mandatory basis in January 2003.[15] The Bulgarian system requires every VAT taxpayer to open at least one VAT account, into which all VAT payments over 1,000 Lev have to be deposited. These VAT deposits have to be made at the time of payment for the good or service, and they must be accompanied by a form containing the taxpayer ID of the purchaser and seller, the amount of VAT, and the VAT invoice number for which the VAT is being paid. That is, a cash method is used for making payments into or transfers from the VAT accounts even though VAT liability arises on accrual. The deposit may be made via transfer from the purchaser's VAT account, if the balance is sufficient, or by direct payment. A VAT taxpayer is not allowed to pay VAT in any other way. Persons who are not VAT taxpayers, such as individuals and exempt entities, are allowed to pay VAT directly to the seller. The seller then has the responsibility of depositing the VAT payments into his VAT account.

The tax authorities maintain a publicly available list of VAT accounts so that purchasers can make deposits to the sellers' account even if the seller refuses to provide account information to the purchaser. The balances in VAT accounts can be used only either to settle the taxpayers' VAT liability with the government or to pay VAT on purchases, by transferring funds to the sellers' VAT bank account. Funds in the accounts can be used for no other

[15] VAT taxpayers were required to open VAT accounts in July 2002. Use of the accounts was voluntary, however, until January 2003.

purposes. For instance, if by mistake a taxpayer accumulates excess balances in his VAT account, he must apply for a permission of the tax authorities to transfer the funds to his regular account.

The Bulgarian VAT is on an accrual basis and thus there is no necessary correspondence between the balance in the VAT bank account at the end of the tax period (a month) and VAT due. Reconciliation is completed for the month by filing a return, as is common international practice. The taxpayer pays any accrued VAT, presumably from VAT account, making deposits if necessary. The taxpayer applies for refunds if the taxpayer is an exporter, or has significant excess credits for some other reason.[16] If approved, the tax authorities make payments of excess credits either to the taxpayer's VAT account or directly to the taxpayer.

This system is supposed to prevent potential tax evaders, particularly fly-by-night firms, from stealing VAT payments made to them by other taxpayers. Under the VAT accounts system, Bulgaria's tax authorities became more confident that VAT payments would not be stolen and agreed to allow legitimate VAT credits as long as the taxpayer has paid VAT into the sellers' VAT account. In addition, the government committed itself to reducing the time lag for obtaining refunds.

Quantitative evaluation of the performance of the VAT accounts system is difficult. Most importantly, there has been no reliable evidence from either Bulgaria, or any other country for that matter, regarding the extent of the specific type of evasion that VAT accounts are supposed to

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[16] The option to carry forward excess credits is also available. Apparently, the taxpayers do not like to apply for refunds because refund claims might generate an audit.

prevent. Also, we are not aware of any more or less comprehensive study that estimates the administrative and compliance costs of VAT accounts. Nonetheless, some qualitative and indirect evaluations can be made. Below, we discuss the main benefits expected by the VAT accounts proponents and costs.

Benefits

(a) The effect on revenue and evasion

One of the main goals of VAT accounts apparently sought by the Bulgarian tax authorities was to increase revenues from the domestic VAT transactions primarily by reducing tax evasion. Such increases should not generally be expected to occur, however, even if VAT evasion declines. For instance, export refunds and domestic credits should increase because of the program.[17] These consequences may offset any VAT revenue increases elsewhere in the economy, at least in part. Indeed, so far the VAT revenue growth from domestic transactions has not been impressive. Nominal domestic VAT collections for the first few months of 2003 increased substantially compared to the corresponding 2002 period, prompting claims of success. Full year collections of domestic VAT, however, increased by only 5.6% in nominal terms and actually declined as a share of GDP (see Table 3 below). Revenues increased significantly in 2004, but are projected to decrease by an even greater amount in 2005. It appears little can be inferred from VAT revenues on domestic transactions, because the series is highly volatile.

[17] Recall the program was supported by a substantial part of the private sector whose interests are to reduce their tax burdens.

Table 3. – VAT revenues in Bulgaria, 2000-2005

Year	VAT on imports (million Lev)	Total VAT revenue (million Lev)	Net domestic VAT revenue (million Lev)	Nominal GDP (million Lev)	VAT revenue in % of GDP	Domestic VAT revenue in % of GDP
	(1)	(2)	(2)–(1)	(4)	100*(2)/(5)	100*(3)/(6)
2001	2,207.0	2,454.4	247.4	29,617.7	8.29	0.84
2002	2,405.5	2,688.1	282.6	32,457.0	8.28	0.87
2003	2,802.5	3,101.0	298.4	34,546.6	8.98	0.86
2004	3,516.8	3,890.6	373.7	38,008.4	10.24	0.98
2005*	4,520.8	4,800.2	279.4	41,182.3	11.66	0.68

* - Forecast.
Source: Columns (1), (2), and (4) are based on the data provided by the Bulgarian Ministry of Finance.

Moreover, two other factors unrelated to VAT accounts have been at work in 2003 that were expected to increase domestic VAT collections. First, the VAT registration threshold was lowered concurrently with the introduction of the VAT accounts resulting in 11,000 additional VAT taxpayers.[18] Second, two export-oriented sectors, scrap metal and grain, were exempted from VAT. As a result, revenues should have increased because no input credit is allowed for firms in these sectors and such firms are not allowed a refund when goods are exported. In addition, firms that buy from these sectors will not have VAT invoices, thus cannot credit the VAT embodied in the price of goods from either the scrap metal or grain sectors. Note also that in 2003 the government introduced a new

[18] Bulgarian Ministry of Finance officials provided this information to the authors. In general, the addition of smaller taxpayers can either increase or decrease revenue. A decrease can result because purchasers of goods and services produced by small businesses would be able to have VAT embedded in the price of inputs and small businesses would be allowed credits on their purchases.

customs administration regime by hiring The Crown Agents, an international company offering capacity-building and institutional development services mainly to the public sectors of developing economies. Revenues from import VAT increased as a result. This phenomenon, however, is unlikely to influence the performance of the VAT accounts system.

Even if the observed increase in VAT during the first months of 2003 was due to the VAT accounts, it was probably a one-time phenomenon. While, according to the statutes, Bulgarian VAT remains on an accrual basis, it appears that under the VAT accounts system tax administrators sometimes require actual payment into the supplier's VAT account for the refund to be allowed. In this case, taxpayers eligible for refunds might speed up payment of accrued VAT, effectively moving to a cash basis VAT on purchases, in an effort to ensure credits or refunds will be honored.[19] This may result in a one-time revenue gain during the early part of the year when VAT accrued from prior periods is combined with VAT paid on a cash basis. The decrease in cumulative revenue by the end of 2003 indicates this might have been the case.[20]

To summarize, the VAT revenue changes in 2003 did not, and could not, provide any evidence for increased VAT compliance due to the introduction of VAT accounts. The Bulgarian tax authorities have also claimed, however, that there has been some direct evidence for the reduction in tax evasion via fly-by-night firms due to the VAT

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[19] It is not clear, however, that this should increase revenues. If credits denied in the past but allowed now are greater than any compliance increase, then revenues might fall.

[20] Another interpretation of the slowdown in the cumulative VAT collections is that taxpayers are beginning to learn how to game the system.

accounts. This evidence is based on the analysis of VAT credit applications by the so-called "risky" firms that the tax authorities suspect of major tax evasion. Since these "risky" firms had not been prosecuted before VAT accounts were introduced, the evidence of their VAT evasion must be quite weak. Finally, we note that while lower tax evasion by itself is likely to reduce economic distortions arising from different propensities of different businesses to evade taxation, the social efficiency of reduced evasion is not measured by the increase in tax revenue. When tax evasion declines, the government accrues the revenue that would have been appropriated by private economic agents. That is, an increase in tax revenue due to lower tax evasion is in part a transfer rather than pure efficiency gain.

(b) Tax administration and compliance

From the point of view of some Bulgarian businesses, an important benefit of the new system of VAT administration has been a greater assurance of receiving credits for VAT paid on inputs and a reduction of VAT refund times. The Bulgarian authorities reported refund times had been reduced to about forty-five days from three to six months. Tax administrators also feel that VAT administration has become less complicated because they no longer have to trace transactions through the VAT chain, as long as they receive proof of payment into the sellers' VAT account.[21] Notice, however, the benefits of speedier refunds and easier tax administration occurred only compared to the system that existed in Bulgaria prior to reform of VAT administration. In general, the introduction of VAT accounts was neither necessary nor sufficient in

[21] Information provided by the Bulgarian Ministry of Finance officials.

order to bring about these improvements in tax administration.

Costs

We classify the costs of VAT accounts into two categories: the one-time costs, which occur either during the transition or whenever a business is set up under the new system, and the continuing costs.

(a) One-time costs

The one-time costs consist mainly of the development of new accounting and administrative procedures and skills, new computer software to handle the new system, and related costs. These costs may be substantial, particularly for smaller taxpayers. To the extent these costs differ among taxpayers, the VAT accounts introduce distortions relative to the pre-reform period.

Another one-time cost of VAT accounts for businesses is the inability to use the VAT payments received by the taxpayers from their customers. Without VAT accounts, a VAT taxpayer can use VAT payments until the tax due date. The fact that VAT payments are deposited in the VAT accounts in effect represents a loss of working capital by the seller. This loss is equal to the average VAT the seller received from the buyers, net of VAT the seller paid to his suppliers. For example, if a firm receives VAT of 100 from its buyer on the 15th of the month and pays VAT of 70 to its suppliers on the same day, it would have the use of 30 until the due date for VAT payment to the state budget. This cost may be particularly onerous for taxpayers who transact via mutual offsets, barter, or other types of non-monetary settlements. Lost working capital may be in part a transfer, not a social economic cost. Either banks or the budget have the use of these funds; thus, the taxpayers' cost is actually a transfer to the banks or to the budget. To the extent banks get to use the funds, they may lend them to the taxpayers to replenish their working capital. In the frictionless credit markets, the inability of the businesses to use VAT payment as working capital would be simply a transfer of interest income from the businesses to the banks and the budget. In the presence of asymmetric information and uncertainty resulting in credit rationing and other problems, the loss of working capital can impose greater costs on businesses than simply those reflected in the market interest rate. Moreover, because different taxpayers have in general different ability to borrow from banks, the loss of working capital by VAT taxpayers would affect different taxpayers in different ways. In particular, larger taxpayers, who have easier ability to borrow, would likely be hurt less than smaller taxpayers. This differential effect may result in distortions favoring larger taxpayers. Such distortions represent social cost.

The inability of a taxpayer to use the funds in his VAT account for anything but to pay VAT becomes particularly problematic if for some reason excess VAT account balances are created.[22] Regardless of the cause, the taxpayer must transfer excess funds to the budget and then apply for a refund, triggering an audit in order for the tax

[22] Excess VAT account balances could arise, for example, if a taxpayer mistakenly overestimates his future VAT liability and deposits too much money in his VAT account. Also, excess balances could appear when a taxpayer makes a large purchase, e.g. an investment. This purchase generates a large amount of VAT credits. Without VAT accounts, the taxpayer may be able to use the subsequent VAT paid by his buyers as working capital. Under the VAT accounts system, the taxpayer either has to apply for a refund from the budget or lose the use of the incoming VAT payments until they can be used to pay VAT to his suppliers.

administration to determine whether the taxpayer owes other taxes before issuing a refund. Excess VAT account balances themselves are a transfer, in fact they are identical to a loss in working capital, but the efforts to prevent accumulating excess balances and the administrative costs of obtaining a refund represent net social cost.

(b) Continuing costs

More administration, in particular, increased paperwork associated with VAT accounts provides the main example of continuing costs. This cost may disproportionately affect small relative to large businesses. One additional payment order must be issued by the buyer and processed by the seller for every transaction between VAT taxpayers for transactions above the threshold. In addition, taxpayers and banks must administer extra bank accounts. To the extent larger taxpayers, more than the smaller ones, rely on computerized processing of transactions, the extra paperwork is likely to hurt smaller taxpayers more.[23]

It is not clear that tax administration effort will be reduced with VAT accounts relative to a more conventional system. The invoice is the key document in a standard VAT administrative system. Under the VAT accounts, however, the tax administration must match the VAT invoice with the VAT account deposit (perhaps on a transaction by transaction basis). Then, both invoice and deposit must be matched with the payment order for the goods or services because of the requirement that payment for goods and services occur at the time of the VAT payment. VAT accounts are less effective without such matching.

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[23] The differential effect of extra transaction processing costs on taxpayers of different size was confirmed in our conversations with various VAT taxpayers in Bulgaria.

At this time, it is difficult to ascertain the balance of costs and benefits of VAT accounts in Bulgaria relative to the unconventional system of tax administration that existed prior to reform. It appears the private sector in Bulgaria is adapting to the new system, particularly the larger taxpayers. One accountant indicated the system should not be employed in normal circumstances, but extreme measures may have been dictated by the unusual Bulgarian circumstances at the time.[24] In Bulgaria, such circumstances apparently consisted of tax administration techniques of punishing honest taxpayers for the fraud committed by unrelated third parties, with which the honest taxpayers had no direct business relationship.

At this time, Bulgaria's authorities appear to be content with the performance of the VAT system and the VAT accounts regime is going to continue. There have been some worrisome indications, however. The overall performance of the VAT accounts system can in part be judged by how frequently it is being used by the taxpayers. Bulgarian authorities reported to us that about 170,000 transactions per month occurred in the VAT bank accounts system in 2003. This is an average of about two transactions per taxpayer. In addition, the tax authorities stated less than 60% of allowable credits had resulted from deposits in VAT bank accounts, as opposed to more than 80% as expected. It is difficult to interpret this information. It might be the case that many transactions are below the threshold,[25] are with exempt persons or final consumers, or large taxpayers are the major VAT accounts users.

[24] This information was obtained in a private interview.
[25] Apparently, many smaller taxpayers prefer to split their normal transactions into several smaller ones in order to get under the threshold.

Nevertheless the reported volume of inter-firm trade among registered taxpayers appears to be low.

In sum, compared to a conventional VAT system, the benefits of the VAT accounts are doubtful at best, while the costs are substantial. Furthermore, even if some types of VAT evasion, e.g., the stealing of VAT by flight-by-night firms described in the example in Table 2, have been reduced by the introduction of the VAT accounts, new evasion schemes can be developed relatively easily.

For example, consider Table 4 that presents a modification of the example in Table 2 where, as before, Firm C is a fly-by-night firm. Firm C now colludes with Firm D by making a purchase from Firm D with a value sufficient for Firm C to maintain a zero balance in its VAT account (see line 4). In addition, let Firm C and Firm D collude by Firm D making purchases below the threshold value (lines 12 - 14). Firm D pays VAT to Firm C outside VAT accounts and Firm C steals that amount by disappearing. Firm D, however, claims a credit for both the VAT in the bank account and the VAT paid on transactions below the threshold. The amount remaining in Firm D's account may be used to offset future legitimate purchases or might be refunded at a later date. Suppose Firm F is audited. Under the new rules, Bulgaria's tax authorities must allow the credit of 151.88, because the purchases are legitimate. The theft, however, will be successful if the government does nothing but confirm that Firm F's deposits (or Firms C's and D's deposits for that matter) into the VAT accounts are correct. Of course, a more extensive audit may reveal the fraud and result in disallowing VAT credit for Firm D. Our point is, however, that Bulgaria's VAT accounts system has not eliminated the possibility to steal VAT unless conventional tax administration work prevents the theft.[26]

Table 4. – Example of Fly - By - Night Scheme Under New Regime
(Firm C is a Fly - By - Night Firm)

	Firm	*A*	→	*B*	→	*C*	→
1	Transactions Subject to VAT Bank Account						
2	Sale	150.00		225.00		337.50	
3	Purchase	100.00		150.00		225.00	
4	Sale From D to C					112.50	
5							
6	VAT Bank Accounts						
7	Transfers from Purchasers	30.00		45.00		67.50	
8	Transfers to Sellers			30.00		45.00	
9	Transfer from C to D					22.50	
10	Balance in VAT Bank Account	30.00		15.00		0.00	
11							
12	Transactions Below Threshold						
13	Sales From C to D					281.25	
14	VAT Received on Below Threshold Transactions					56.25	
15							
16	Summary						
17	Total Output VAT	30.00		45.00		123.75	
18	Total Input VAT			30.00		67.50	
19	VAT Paid to Government	30.00		15.00		0.00	
20							
21	Amount of Theft					**56.25**	

[26] We reiterate that the introduction of the VAT accounts apparently did facilitate VAT credits for honest taxpayers. In the framework of this example, Firm F can be reasonably sure under the new system that it will receive credit for VAT paid to its suppliers. We also stress, however, Firm F should be eligible for credits in any conventional VAT system.

Table 4. (*Continued*)

	Firm	→	D	→	E	→	F
1	Transactions Subject to VAT Bank Account						
2	Sale		506.25		759.38		1,139.06
3	Purchase		337.50		506.25		759.38
4	Sale From D to C		112.50				
5							
6	VAT Bank Accounts						
7	Transfers from Purchasers		101.25		151.88		227.81
8	Transfers to Sellers		67.50		101.25		151.88
9	Transfer from C to D		22.50				
10	Balance in VAT Bank Account		56.25		50.63		75.94
11							
12	Transactions Below Threshold						
13	Sales From C to D		281.25				
14	VAT Received on Below Threshold Transactions		56.25				
15							
16	Summary						
17	Total Output VAT		123.75		151.88		227.81
18	Total Input VAT		123.75		101.25		151.88
19	VAT Paid to Government		0.00		50.63		75.94
20							
21	Amount of Theft						

The above scheme is but one example of potential fraud that would not be adequately addressed by VAT accounts. Other examples include false invoicing, firms colluding with the banks for false deposits, firms bribing tax officials, false exporting combined with the untaxed sale of the goods domestically, or simply underreporting of retail sales. In short, there is little reason to believe the introduction of VAT accounts by itself would significantly reduce overall VAT evasion if the probability of effective audit is sufficiently small to warrant taking the risk.

4. VAT Accounts Discussed in Russia

We now turn to the analysis of some possible alternative rules for VAT accounts that were proposed in Russia. While the gist of the Russian system was quite similar to the one in Bulgaria, there were at least two significant differences. First, unlike Bulgaria, every Russian business, whether VAT taxpayer or not, would have to open a VAT account. Second, again unlike Bulgaria, no exemption for small transactions was proposed in the Russian draft law. The latter difference appears to be motivated by the desire of the Russian drafters to close a potential loophole that appears in the Bulgarian system. Large transactions could be split into smaller ones, thereby avoiding the requirement to use VAT accounts.[27] There are indications this loophole has been used in Bulgaria for tax evasion purposes, although it is hard to judge the extent of this evasion. Both differences would result in greater taxpayer compliance costs.

While the above statutory differences are important, the specifics of Russia's economy and the tax system in general are likely to affect the balance of costs and benefits of VAT accounts to an even greater extent. We begin again with the analysis of potential benefits.

Benefits

(a) The effect on revenue and evasion

As we mentioned earlier, the proponents of VAT accounts argue the major benefit of the system is higher

[27] The purpose of the former difference is unclear to us.

degree of compliance and the resulting increase of VAT revenue collected.[28] Therefore, these proponents would be more likely to argue for VAT accounts in a country with poor VAT collections. According to our estimates presented in the Appendix, VAT collections performance in Russia has not been significantly different from that in Bulgaria and lies well within the international standards. Our cross-country comparisons, however, are based on 2001 data. Meanwhile, Russian officials contend VAT evasion grew dramatically during 2002-2003. A report by Ministry of Taxes and Fees, produced during the VAT accounts discussion, notes that while during the first half of 2003 nominal GDP grew by 26.3% compared to the first half of 2002, VAT credits for domestic operations claimed by taxpayers increased by 39% and accepted refund claims for zero-rated transactions rose by 53% over the same period.[29] Comparisons between 2004 and 2003 are complicated by the reduction in 2004 of VAT rate from 20% to 18%. Nonetheless, it is clear that the situation with respect to export refunds changed rather dramatically, highlighting the volatile nature of these numbers. While nominal GDP growth during 2004 remained relatively stable at 26.5%, VAT credits claimed by taxpayers (including VAT credits for imported goods) grew by 61.2%; total refund claims increased only by 24.6%. Of the latter, refund claims accepted by the tax service and the courts increased by 16.0%. Overall VAT collections as a share of GDP have declined from 6.9% in 2002 to 6.6% in

[28] As we argued before, the effect of VAT accounts on net VAT revenue may either positive or negative (or zero).

[29] According to the same report, VAT credits for domestic operations rose from 26.1% of GDP in the first half of 2002 to 28.7% of GDP in the first half of 2003. The corresponding percentages for refunds accepted by the tax authorities increased from 2.1% to 2.6% of GDP. The actual refunds during the same period went up from 2.2% to 2.3% of GDP.

2003 and to 6.4% in 2004. Adjusted for the 10% rate decline, however, VAT revenues have remained stable. In addition, it is important to keep in mind that the share of credits in VAT may change for a number of reasons, most of which are unrelated to VAT evasion via fly-by-nights. One such reason may have to do with VAT credits coming due on investment goods purchased earlier.[30] In addition, VAT credits are affected by profit margins of Russian producers that depend on the degree of competition and other factors.

In any case, government estimates of direct budget losses due to all false VAT credits claimed, including those that are not related to fly-by-night firms, are relatively small. The Ministry of Internal Affairs estimates these losses at 1.5 billion Rubles (or about $50 million), presumably per year (*Gazeta*, No. 217, p. 9, 11/21/2003), which would represent less than one-third of one percent of VAT collections in 2003. Therefore, even if VAT accounts were to lead to greater compliance, the effect on collections in Russia is likely to be rather small. This implies the decrease in economic distortions would be small also. Moreover, as we will argue below, the introduction of VAT accounts may on balance even promote tax evasion.

(b) Tax administration and compliance

Direct taxpayer benefits of VAT accounts would have been probably relatively low in Russia. While Russian

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[30] Since 1996, VAT paid on purchases of fixed assets could be credited only after these assets have been placed in service (Art. 171 (6) of the Tax Code). Given a sharp increase in investments in fixed capital assets in 1999 and, especially, 2000, the postponed credits from those years may be substantial. Unfortunately, we do not have the appropriate data to ascertain the significance of this factor. As of January 1, 2006, VAT on capital inputs is eligible for immediate credit.

exporters would certainly benefit from faster VAT refunds just as much as their Bulgarian counterparts, the current ability of Russia's VAT taxpayers to take credit for VAT paid appears to be quite adequate; therefore, unlike in Bulgaria, the introduction of VAT accounts cannot dramatically improve the Russian situation in this respect.

The Russian government proposed, in addition to simplifying the procedures for VAT refunds to exporters, the introduction of VAT accounts be accompanied by an allowance of immediate credit for VAT paid on capital inputs and an exclusion of advance payments for exports from the VAT tax base. Both measures are appropriate, however, such changes should not be tied to the introduction of VAT accounts.[31]

As in Bulgaria, one benefit of VAT accounts claimed by the government would be to reduce the workload of tax administration. As we argued in the previous section, however, the reform benefits in Bulgaria were mainly due to the elimination of highly inefficient tax administration practices. In countries such as Russia, where VAT administration uses more conventional approaches, VAT accounts may actually increase administrative costs. This occurs since tax administrators would need to monitor the use of VAT accounts, in addition to conventional tasks, such as keeping track of VAT taxpayers and the legitimacy of exemptions, auditing taxpayers to prevent underreporting of sales, false invoicing, and other potential

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[31] Since both exports and investment play a relatively small role in small Russian firms, these measures would not adequately compensate small taxpayers for the costs of VAT accounts. For example, small enterprises with aggregate sales of 630 billion Rubles in 2002 spent only 11 billion Rubles on capital investments (*Vedomosti*, 12/19/2003).

evasion.[32] Also, the much greater number of firms and transactions in Russia than in Bulgaria would make it more difficult for tax administration to monitor the flow of funds through VAT accounts and reconcile it with the firms' books.

Note, however, the system proposed in Russia would have made tax evasion somewhat more difficult than in Bulgaria as most Russian taxpayers use the cash method for VAT, and even those who use "accrual" are allowed credits only after payment for inputs. Thus, businesses could not claim credit on purchases from fly-by-night firms before the payment of tax has been transferred to the fly-by-night's VAT account.[33]

We conclude that the benefits, if any, of the introduction of VAT accounts would have likely been smaller in Russia than in Bulgaria mainly because the gain from eliminating onerous tax administration and compliance procedures would have been smaller in Russia.

[32] Some Russian government officials suggested auditing would become much easier under the VAT accounts system, because to issue a refund to an exporter, for example, the tax administration would only need to check the payment into VAT accounts (see *Gazeta*, 11/21/2003, No. 217, p. 9). This is, however, an overly optimistic view. For example, a firm could claim export, but instead sell the goods domestically without reporting the sale to the authorities. The loss to the budget in this case would be the same with or without VAT accounts.

[33] Of course, the cash method opens up other opportunities for evasion; and, the asymmetric nature of the Russian "accrual" method for VAT generates its own distortions by letting VAT liability of the seller arise before the corresponding credit is allowed to the buyer.

Costs

The costs of this reform in Russia would probably significantly exceed those in Bulgaria, given the specific features of Russia's economy and the more restrictive nature of the proposed VAT accounts. Russia's economy is larger and more complex than Bulgaria's, presumably implying a greater degree of specialization. If that is indeed the case, the number of domestic VAT transactions per unit of GDP must be greater in Russia than in Bulgaria. Assuming per transaction administrative and compliance costs of VAT accounts do not decline rapidly, this would raise the costs of the system in Russia per unit of GDP.

According to a report by Russia's Ministry of Finance (Report, 2003a) about 13 billion VAT invoices are issued in Russia annually. Recall that VAT accounts in Bulgaria registered approximately 170,000 transactions per month, or slightly more than 2 million transactions annually. The exemption of small transactions from Bulgaria's VAT accounts explains some of this difference. Whatever the reason, the implication is that more than six thousand times more paperwork would be generated in Russia relative to Bulgaria. The large number of transactions would greatly raise the compliance costs both to VAT taxpayers and banks in Russia. It is difficult to estimate additional compliance costs to either of these categories of businesses. As a suggestive example, the Russian railroad monopoly claims its costs of additional personnel and hardware to service VAT accounts would necessitate a price of service increase of about 2%. Other industries claim compliance costs would be even higher (*Vedomosti*, 12/3/2003).

VAT accounts system makes it costlier to transact via barter or using other non-monetary forms of payment.

To the extent Russian firms make greater use of such non-monetary transactions, the economic costs would be greater as well. We do not know the extent of non-monetary forms of payment in Bulgaria, but in Russia it remains significant, although it declined dramatically since the mid-1990's.[34]

As in Bulgaria, VAT accounts would result in a working capital reduction. This reduction has been estimated at about 0.7% of Russia's GDP.[35]

The VAT accounts system is particularly costly for an economy where the role of computers in record keeping and transactions processing is relatively small. While the Russian government is trying to promote electronic tax reporting, the current level of computerization in Russia remains quite low. According to Russia's Ministry of Taxes, only 15% of all tax reports were filed electronically as of the end of 2003 (Report, 2003b).

5. Recommendations on the Alternative Approaches to Fighting VAT Evasion Via Fly-by-Night Firms

One of the apparent main motivations for introducing VAT accounts has been the view that in an economy where tax administration is weak, tax evasion is widespread, and where tax administrators are relatively easily corruptible, no feasible alternative methods for fighting VAT evasion exist. As argued above, we doubt VAT accounts is cost-effective way to fight VAT evasion. Moreover, we note that if tax administration is sufficiently

[34] According to survey reported in Fleishman & Herz (2005) the share of total receipts and payments Russian businesses settled via barter declined from over 60% in 1996 to less than 15% in 2002.
[35] See Trunin (2004). As we noted earlier, the reduction in working capital does not represent net social cost, although it imposes costs on businesses.

corrupt and taxpayers have high propensity to evade, no technique would work well. That is, no collection method, including VAT accounts, is completely self-enforcing. Given incomplete corruptibility of tax administration, however, we also think feasible conventional techniques exist to limit tax evasion, particularly through fly-by-night firms. Below, we present our recommendations for alternative approaches. We believe these alternatives are reasonable revenue-enhancing mechanisms that reduce the administrative burden for both taxpayers and tax administrators.

The main tool for preventing tax evasion via fly-by-nights is provided by appropriate registration procedures. An entity must be a registered VAT taxpayer to issue legal VAT invoices and to collect VAT. This means a "fly-by-night" firm must be a registered taxpayer if the scheme is to be successful. Thus, the first place to address the issue of fly-by-night firms is the registration process. Procedures should be developed that would ensure, as much as possible, only legitimate firms are registered. A number of measures can be implemented to secure reasonable registration for legitimate firms and to deter fraudulent registration.

Each new firm should be required to provide the tax authorities with information sufficient to ascertain if the entity is legitimate and to document certain relationships. This information should include: the name and local address of the entity;[36] the names and addresses in Russia of either owners (in the case of an unincorporated business) or significant shareholders, if any (in the case of a juridical person);[37] the names and addresses in Russia of the principal officers; the nature of the business according to standard industrial classifications; the name and addresses of the accountant or accounting firm that maintains the books of account; the names and addresses of all branches of the entity, to the extent relevant; and, copies of other official registration materials, such as corporate registrations. In addition to verifying, to the extent feasible, the above registration information, the VAT authorities should inquire with the income tax department to determine if the taxpayer is registered for profits tax, wage withholding, and other taxes.

Registration should not be allowed, and a VAT taxpayer number should not be issued, until all information is provided and verified. Eventually a computerized registration system should be established that would enable tax administrators to check whether the same individuals or entities have opened multiple businesses in the past, or

[36] Entities sometimes provide an address that is the office of their accountant or a post office box. This address, in general, is not sufficient. If the enterprise is to engage in the supply of goods and services, then an office or place of business address is necessary. Even a trading firm needs a place of business in Russia to provide taxable supplies under the VAT law. The home address of the principal officers should be provided (and checked) if no other location is provided.

[37] Major shareholders, or owners, might be juridical persons. The tax authorities need to verify these juridical persons are legitimate by checking the local registration, if the juridical person is a Russian entity, or investigating the nature of the enterprise, if the juridical person is foreign or nonresident. A minimum threshold of stock ownership, at least 10%, should be determined in the case of juridical persons.

whether multiple businesses are currently operating under the same ownership structure.

An important part of enforcement consists of site visits. Tax administrators should conduct an initial visit to the offices of the new taxpayer. Two functions are served by this visit. First, taxpayers can be provided with information about the VAT and VAT procedures. Second, the tax administrator should be able to confirm the necessary information provided by the taxpayer during the registration process. After the site visit, tax administrators should be required to complete an initial report and evaluation of the taxpayer. Any individual tax administrator, or group of tax administrators, should be subject to disciplinary action, including criminal prosecution, for submitting false reports, otherwise colluding with the taxpayer, or attempting to solicit side-payments from the taxpayer.

Newly organized firms that have no record of substantial sales might nonetheless seek voluntary registration. It might be prudent, in some cases, to delay voluntary registration of questionable operations until the operation has had time to establish business relationships and to conduct transactions that can be audited.[38] A delay in voluntary registration will help ensure suppliers are legitimate entities and serve to reduce collusion among buyers and sellers.

Increasing the turnover threshold to limit the number of taxpayers would reduce the potential adverse effects of delayed voluntary registration and facilitate to a great extent administration in general. (The current

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[38] Clear criteria should be developed to ensure legitimate business is not hampered by registration delays.

threshold is one million Rubles per quarter, or approximately $30,000.)

Improvements in the registration procedures would probably need to be complemented by enhanced monitoring during the period immediately following registration.[39] The tax administration should check to ensure a return is filed promptly. If the initial return is not filed, then the tax administration should notify the taxpayer and seek compliance. If no business is located, actions should begin against principal directors and related parties. If the return is filed, it should be audited so taxpayers know how to comply and are aware tax administrators are performing their professional responsibilities. In addition, it is important to keep the VAT registry up-to-date.

A performance bond might be required for some new taxpayers in selective cases. The criteria for requiring a performance bond might include a history of noncompliance by owners, no transaction history for the entity applying for registration, and other indicators that the registrant might disappear without paying tax. The bond should be returned with interest, or used to offset the VAT liability for the taxpayer once a compliance record has been established.

Finally, coordination between the customs and tax administration should be increased so that information is shared about taxpayers and questionable transactions. We reiterate, however, that no set of administrative measures will work if the tax administration is corrupt. Therefore, while there are no easy cures for the problem of corruption, the anti-evasion policies should be part of the overall

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[39] The organization of tax administration is beyond the scope of this paper. Therefore, we make no recommendation about who should organize monitoring, or how it should be organized.

strategy of reducing corruption. At the same time, we caution against undue zeal in the fight against corruption. One significant problem with tax administration in Russia appears to have been the impression conveyed by the government that all taxpayers are either engaged in criminal activity or are about to engage in such activity. The proposed VAT accounts system and the failure to provide either credits or export refunds in a timely manner are examples of such attitude by the government. Of course, some criminal activity is an inevitable part of any tax system, but such perceptions should not be allowed to dominate either policy or administrative rule making. We believe actions should be taken to ensure taxpayers who comply would not be burdened with excessive regulations, costly reporting, and financially costly compliance methods, as the VAT bank accounts. A good first step for the government would be to obey its own laws and regulations. For example, VAT export refunds should be promptly paid and credits allowed if procedure is followed and there is no indication of questionable activity.[40] Other steps should include streamlining procedures and reducing the administrative effort devoted to monitoring all taxpayers, so that resources are released for more selective, and more productive, enforcement activity.

In summary, there is no simple solution to evasion by taxpayers and corruption by tax administrators. Treating all taxpayers as potential criminals by requiring procedures such as VAT bank accounts, however, is both costly and

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[40] We believe governmental noncompliance with current law may be one reason for taxpayer noncompliance. For instance, if a taxpayer is not able to obtain a refund for a legitimate export transaction, he might be driven to organize a fly-by-night firm, particularly if his competitors resort to such mechanisms. Such an activity would not be necessary if the government paid the refund in a timely manner to begin with. See also Alexeev (2000).

ultimately counterproductive. There is no substitute for hard work, reduction in corruption and marginal, but steady, progress toward reform. It is important that the government, as well as the taxpayers, be held accountable. Thus, administrative plans should be publicly available, procedures should be as impersonal as possible, and rulings should be perceived as fair.

6. Conclusion

In this paper, we described the workings of and the proclaimed motivations for the VAT account scheme implemented in Bulgaria and discussed in several other countries. Based on general considerations and the analysis of Bulgarian experience, we conclude VAT accounts in Bulgaria might have been an improvement over the earlier highly problematic system. Relative to a conventional VAT system, however, the benefits of VAT accounts, if any, are uncertain while the costs are unavoidable and probably substantial. In particular, VAT accounts substantially increase compliance costs of all taxpayers, reduce their working capital, and increase administrative costs relative to conventional VAT. Moreover, the effect of VAT accounts differs across different groups of taxpayers, resulting in economic distortions. We also argued conventional alternatives exist to fight the types of VAT evasion that VAT accounts are supposed to counteract.

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Appendix

Table A1. – Cross-Country Regression Estimates for 2002
(Dependent variable: VAT revenue/GDP)

Regression		*Linear 1*	*Log-Linear 1*	*Linear 2*	*Log-Linear 2*
Constant		1	3.11***	0.79	3.32***
		(1.32)	(4.18)	(1.54)	(28.21)
VAT rate		33.73***	0.84***	33.74***	0.82***
		(11.73)	(12.15)	(11.94)	(12.7)
ExIm/GDP		-3.31*	-0.45	-3.40*	-0.37
		(-1.90)	(-1.40)	(-2.01)	(-1.21)
PC GDP		0	0.03	--	--
		(-0.38)	(0.35)		
TR dummy		-0.71	-0.04	-0.59	--
		(-1.42)	(-0.47)	(-1.53)	
Predicted VAT/GDP	Russ	6.07	6.51	6.38	6.95
	Bulg	7.4	7.71	7.35	7.69
Adj. R^2		0.83	0.84	0.84	0.85

Notes: Each regression has 30 observations.
The t-statistics are in parentheses.
'***' -- significant at 1% level; '**' – significant at 5% level; '*' – significant at 10% level;
VAT rate – the standard rate of VAT;
ExIm/GDP - share of the difference between export and import in GDP. In the log-linear regressions, this variable was replaced with (1+ExIm/GDP);
PC GDP - per capita GDP in purchasing power parity terms;
TRdummy - economy in transition dummy.
Data sources: OECD (2003)

Table A2. – Predicted VAT collections and residuals for Linear Regression 1

	Predicted VAT collections (% GDP)	*Residuals*	*Relative residuals (deviations as share of predicted collections)*
Mexico	6.03322	-2.41873	-0.4009
Italy	7.486496	-1.28504	-0.17165
Canada	2.955076	-0.42862	-0.14505
Czech Rep.	7.863573	-0.9243	-0.11754
Belgium	7.768991	-0.71001	-0.09139
Luxembourg	6.113421	-0.51161	-0.08369
Australia	4.18244	-0.33513	-0.08013
Poland	7.843158	-0.5132	-0.06543
Spain	6.417363	-0.41874	-0.06525
Hungary	8.724492	-0.34784	-0.03987
Norway	8.343034	-0.22702	-0.02721
Ireland	7.004303	-0.10649	-0.0152
France	7.391865	-0.0949	-0.01284
Sweden	9.113802	-0.08861	-0.00972
United Kingdom	6.807553	0.014217	0.002088
Japan	2.395629	0.039975	0.016686
Slovak Rep.	7.247692	0.190597	0.026298
Finland	7.956111	0.233137	0.029303
Iceland	9.137302	0.313083	0.034264
Portugal	7.653247	0.408542	0.053381
Netherlands	7.022543	0.415714	0.059197
Denmark	9.022342	0.677273	0.075066
Austria	7.567206	0.622506	0.082264
Russia	6.418132	0.681868	0.106241
Germany	6.015274	0.692673	0.115152
Greece	7.42159	0.869472	0.117154
Bulgaria	7.377123	0.912877	0.123744
Turkey	7.148963	0.940665	0.131581
Korea	4.095051	0.588953	0.143821
Switzerland	3.296635	0.808691	0.245308

The rankings are not significantly different for the other three regressions.