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***Tax Structures and FDI
The Deterrent Effects of Complexity and Uncertainty***

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Tax Structures and FDI The Deterrent Effects of Complexity and Uncertainty

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Abstract

In this study we examine the connection between the varied experiences of the transition countries in attracting FDI and their diverse experiences in transforming their tax structures to be consistent with a market economy. In particular, we study whether complexity and uncertainty in their tax laws have deterred foreign direct investment by increasing transaction costs, the compliance burden and the unpredictability of tax liabilities. Our results indicate that complexity and uncertainty, in the sense of multiple tax rates, indeterminate language in the tax law, and inconsistent changes in the tax laws have a significant negative effect on inward foreign direct investment.

JEL Classification: H25, F21, F23

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1. Introduction

The countries of the former Soviet Union and Eastern and Central Europe (FSU and ECE), in their attempt to rapidly transition to a market economy, have made substantial changes in their tax structures to bring them into conformance with the needs of a market economy. With their growing understanding of the functioning of a market economy and the necessity to jettison a tax system that served very different goals, these countries have experimented greatly with their tax systems in the years since the beginning of transition. These efforts have resulted in frequent changes in tax law. They have also resulted in complaints by the business community that tax laws are complex and that tax liabilities are uncertain.

The purpose of this paper is twofold. The first objective is to record some of the dynamics of the tax reform process in transition economies using information from a special tabulation of tax laws published by the International Bureau of Fiscal Documentation. Although this annual publication was issued only for the years from 1993 to 1998 it offers unique opportunities for examining those tax structures during this important period.

The second objective of the paper is to examine empirically whether complexity and uncertainty in tax laws negatively affect the flow of foreign direct investment (FDI) to these countries. Previous studies of the transition countries have indicated that complex laws and frequently changing tax legislation are a major obstacle to doing business (see OECD, 1995). While the evidence presented in these studies is itself interesting and insightful, it suffers from a selection bias problem in that the results are obtained from surveys of firms that already operate in those countries. Clearly, these firms have managed to overcome problems with the tax law. However, such studies cannot discern whether complex legislation actually deterred others from investing. We add to the literature in several ways. First, we design a set of explicit measures of

tax complexity and tax uncertainty. We then test empirically their effects on flows of foreign capital across the transition economies.

We contribute further by examining a concrete mechanism through which institutions can affect business decisions. While the literature on economic transition often stresses the importance of institutions and a functioning government to support the development of market structures in these economies (EBRD, 1999, Bevan and Estrin, 2001, Meyer, 2001), few studies have examined specific institutions to determine their relative importance to economic activity.¹ Our contribution in this respect is that we isolate the effect of a particular aspect of the institutional framework – the tax structure². Our results suggest that features such as a large number of special tax rates for various economic activities, the use of ambiguous language in the laws, and frequent and inconsistent changes in tax laws have a deterring effect on FDI.

The remainder of the paper proceeds as follows. In section 2 we explain the conceptual relationship between tax complexity, uncertainty and investment. In section 3 we present our measures of complexity and uncertainty, including tables showing the variety of experiences in tax policy in these countries. Foreign direct investment data and a set of control variables are presented in section 4 and a discussion of our empirical results follows in section 5. The final section offers concluding remarks.

2. Uncertainty, Complexity, and Investment Decisions

The design of the tax structure and the way in which it changes over time can critically affect the level of risk and transaction costs associated with investment.³ In this section we first

¹ Holland and Pain (1998) study the effect of the mode of privatization on FDI. Ramcharan (2000) studies the effects of Bilateral Investment Treaties and competition laws on FDI.

² We differentiate between the direct effects of the level of taxes and the institutional effects of the design of the tax structure.

³ Moreover, to the extent that complexity imposes a burdensome administrative cost on the taxing authority, tax rates will have to be higher than that necessary to raise an equivalent amount of revenue under an alternative, less complex system.

discuss a variety of costs associated with complex tax legislation. We then discuss a number of ways in which uncertainty over tax liabilities may arise, including as a result of tax complexity itself.

2.1 Costs of Complexity in the Tax Structure

Complex tax legislation, usually associated with the number of tax rates, tax bases and the number of special provision it includes, directly imposes transaction costs on a firm, reducing the return on any given investment (Warskett, et al, 1998). Complexity is costly because firms must seek both to understand the tax law as it applies to their activities and to fulfill the requirements necessary for them to remain in compliance. The greater the number of provisions in the tax code, the more time must be devoted to discerning which provisions are applicable to a particular activity. Although the initial reading and comprehension of the law imposes only a one-time cost to the firm for any particular activity, shifting policy priorities lead to frequent changes in tax laws, and the firm must continually reassess the law to determine how its various activities are affected.

Directly measuring the cost of assessing tax law is difficult, but there is ample evidence of the high cost incurred in order to remain in compliance with the tax system. Calculating tax liabilities, completing requisite forms, maintaining records and providing documentation all contribute to what is termed the compliance burden. Estimates of these costs indicate they can be quite high. For example, compliance costs for combined U.S. federal and state corporate income tax are estimated at over three percent of revenues collected (Slemrod and Blumenthal, 1996). Evidence from other countries puts estimates in the range of 2 – 24 percent of total collections (Alm, 1996; Blumenthal and Slemrod, 1992).⁴ Similar systematic estimates are not available for transition economies, but anecdotal evidence suggests that compliance burden can be substantial. For example, the reporting requirements of the Russian tax system are so demanding that even small firms are obligated to employ a full-time accountant in order to

⁴ For Great Britain / United Kingdom, see Sanford (1973, 1995) and Sanford, Godwin, and Hardwick (1989). For Australia, see Fayle and Pope (1990). For Canada, see Vaillancourt (1989).

remain in compliance (Mudd, 1996).

In addition, tax complexity may hinder investors indirectly *via* fiscal illusion, or a misperception on the part of the taxpayer of the true amount of taxes paid (Wagner, 1976). Analogous to the problem of investment under uncertainty, the informational cost associated with increased complexity in the tax system will, on the margin, discourage taxpayers from informing themselves (Heyndels and Smolders, 1995).

2.2 Sources of Uncertainty in the Tax Structure

Another aspect of tax structures that may impact FDI decisions is uncertainty. Uncertainty affects business decisions because firms and individuals prefer less risk for any given expected return (see Hassett and Hubbard, 1997; Dotsey, 1990; Bizer and Judd, 1989; Hassett and Metcalf, 1999; and Edmiston, 2001). Given a firm's business activities in a given period, uncertainty about its tax liability may arise for a number of reasons.

First, frequent changes in tax law can generate uncertainty about the return on an investment in future periods. Ample examples of government capriciousness in the tax treatment of firms are available to support doubts of government credibility in maintaining any given tax policy. This problem is especially pervasive in countries of the FSU and ECE, as evidenced by a report from the American Chamber of Commerce in Russia (1994, 8-9):

“The Russian tax regime has changed continuously over the past four years through the adoption of laws creating new types of taxes, the issuance of Presidential Decrees on taxation and varying interpretations of these laws and decrees by the Ministry of Finance and the State Tax Inspectorate. These changes have taken place repeatedly and radically, generally with no warning or reference to policy decisions, and often retroactively. If prior beneficial laws have been ignored or changed without provision for those who have made economic decisions based on those laws, then potential investors know that they must deal with an uncertain future and that no assumptions regarding taxation are sufficiently credible for analyzing the economics of proposed Russian projects. Investment projects which make sense under one tax regime obviously can become unprofitable or even unworkable when the tax law suddenly changes. This considerably increases the risk of making an investment.”⁵

⁵ Uncertainty may also be connected with the likelihood of known draft tax legislation being passed. For example, the Russian Federation Ministry of Finance has designated a Deputy Minister to develop a new tax code since 1994. The tax code was officially presented in 1996 but a draft still had not been passed by the legislature by mid-2001.

Second, the current written laws and procedures themselves can be a source of uncertainty. In its study of taxation and foreign direct investment in the transition economies, the OECD found many instances in which the law “was seen as imprecise and vague . . . [p]rofessional advisors found it difficult to provide confident interpretations of the law (OECD, 1995, 22).”⁶ Often, the language itself is confusing.

Third, complexity itself may generate uncertainty because it can hinder discernment of the meaning of the law. In fact, tax law can be so complex and its evolution so disjointed, that, as the American Chamber of Commerce in Russia report noted above, provisions can be enacted that conflict with existing legislation. This last problem, along with the uncertainty due to imprecise language or conflicting provisions, is compounded in the environment of the transition economies in which tax administration bureaucracies are new, instructions are still under development, and there is a lack of precedence in a nascent court system (See Schaffer and Turley, 2001; Bevan, Estrin and Meyer, 2000).

3. Empirical Measures of Tax Complexity and Tax Uncertainty

Information on the tax laws of the countries under study was obtained from the *Central and East European Tax Directory* published by the International Bureau on Fiscal Documentation (IBFD). The publication is suitable for the purposes of this paper for three reasons. First, it offers substantial information on various features of the tax system relating to corporate profits taxes, including tax bases, tax rates and special provisions. Second, it uses a common format of tables and language for all countries and all years allowing direct comparisons of laws between countries and within countries over time. Third, it includes all 24 transition countries in ECE and the FSU. A limitation of this source is that in 1999 the format was altered and several countries were dropped from the sample. For this reason, we restrict the

⁶ Even if there is certainty in the tax legislation, uncertainty may arise from unpredictable application of tax rules by tax officials, especially in developing countries (Alm, 1996; Bagchi et al., 1995; Mayshar, 1991). It has become a common practice for multinational firms to negotiate the terms, including tax policy terms, under which they will begin operations in the host country (see *e.g.*, Edmiston *et al.*, 2001).

period under study to 1993-1998.⁷ Nevertheless, this period is interesting as it contains some of the very early efforts in reform of the tax system, a process which is still ongoing (see Martinez-Vasquez and McNab, 2001, for an overview of tax reforms in transition countries).

According to Warskett, et al (1998, 123), "the complexity of a tax system is usually associated with the numbers of tax rates, tax bases and special provisions it includes." In the spirit of this definition, we derive three proxies based on various features of the published laws as described in the IBFD publications. Two additional proxies for tax uncertainty are derived by examining how tax structures changed over time. The derivation of these five measures as well as tables depicting their dynamics, are discussed below.

3.1 Measure 1 (Rates): Number of different tax rates

Our first measure of complexity consists of a count of the number of different tax rates listed in the profits tax legislation. The key complexity issue is the difficulty in determining the bases to which these special rates apply, especially when a single activity or portion of an activity may be reasonably assigned to more than one base. Some examples of activities subject to different rates indicate the potential for ambiguity: finance and insurance, agriculture, auctions and leasing, offshore activities, joint ventures with greater than 30% foreign participation, firms for which income from land is the major source of income, catering, video rental, and special economic zones.

As Table 1 shows, there was substantial variation across countries in the number of special tax rates. Some of the republics of the former Soviet Union had on average three or more special tax rates. Other countries, such as Slovenia, Poland, Macedonia, and Croatia did not have any. A comparison of 1993 and 1998 suggests that there was a general tendency to reduce the number of special tax rates. Nevertheless some countries, for example Belarus, Romania, and the Russian Federation, increased the number of special tax rates during the period.

⁷ A panel of 24 countries over the 1993 – 1998 period provides 144 observations. Because we have missing data for some countries for some years, our regressions, discussed below, have between 120 and 131 observations.

3.2 Measure 2 (Lines): Number of lines in the description of the tax base

The IBFD maintained both a consistent table format and, seemingly, the same level of detail in their description of tax laws throughout the period. Comparison of the number of lines across time and across countries may be a good indicator of the level of complexity in tax law.⁸ Our second measure of complexity consists of an annual count of the number of lines listed in the IBFD's description of the profits tax base. A greater number of lines may be associated with a greater number of special provisions, conditions, restrictions, etc. which firms must assess in order to determine their tax liability. Inclusion of such provisions raises the transaction cost to businesses and may introduce additional uncertainty. However, there is some ambiguity in this measure as additional lines might also indicate greater precision for determining tax liability rather than increased complexity. More precision can lower both the transaction cost associated with interpreting tax law and the uncertainty over computing the tax liability of a given activity. We will return to this issue in the empirical section.

Table 2 shows the substantial variation among countries in the IBFD's descriptions of their profits tax law. Some countries, such as Hungary, Russia, Bulgaria, and the Czech Republic, have a lengthy tax base description (12-16 lines) while others, such as Albania and Slovenia, have shorter ones (6-7 lines). The general tendency across countries has been to increase the level of detail in the tax base.

3.3 Measure 3 (Vague): Presence of indefinite phrases

Many times the legislated eligibility criteria for use of particular tax rates, tax base or tax incentives are not sufficiently precise to allow firms to accurately predict their eligibility. For example, some descriptions of the legislation contain such vague phrases as “donations to approved charities *and other* institutions” are tax deductible (Armenia) or that “Special

⁸ Although the authors of the separate tables for each country may vary, the strict format of the tabulation helps lessen any variation due to differences in their diligence.

incentives *may* be granted by the government to encourage reconstruction and development” (Croatia). Our third measure tries to capture such ambiguity in the language of the law. We create a variable which takes four possible values: 0 if there are no indefinite phrases in the definition of the tax base or in the description of special provisions: 1 if the language is definitely characterized by ambiguity: the values 0.3 and 0.7 are assigned to capture intermediate cases. Clearly, this is a subjective exercise but we have attempted to apply the same criteria for each country.

As Table 2 shows, the description of the law in Slovenia and Poland presented few ambiguities while in Russia, Moldova and several other countries, the level of indefiniteness has been high throughout the period. The general tendency has been to reduce ambiguities, but clearly the experience varies across countries.

3.4 Measure 4 (Chgs): Number of change in tax parameters.

Frequent changes in tax parameters add uncertainty to tax planning. They may indicate that further changes are in store because of continuing shifts in priorities, they may represent attempts to close loop holes, or they may indicate a practice of enacting unsustainable tax legislation. One way to capture such changes is by counting the number of changes that occurred regarding the tax rate. In particular, the fourth measure we use is the sum of changes in the highest marginal tax rate and changes in the number of different tax rates in a country over the period.

Table 1 shows that along with changes in the number of special tax rates (column 9), there were significant changes with the highest statutory marginal tax rate (column 5). The general tendency across countries has been to lower that rate, from 33 percent in 1993 to 29 percent in 1998. In some countries, *e.g.*, Slovakia and Romania, the rates have remained fairly high compared to other countries. In other countries such as Bulgaria and Hungary, the rate has declined substantially. Yet in other countries, like Tajikistan and Uzbekistan the rate has changed in opposing directions.

We should point out that the number of changes in tax rates may be an inexact measure of uncertainty because some changes may be announced and credible and therefore would not contribute to uncertainty (see Auerbach and Hines, 1987, 1988). Table 1 indicates, for example, that Poland went through two changes in its tax rates over the period. However, Poland had committed to decreasing the profits tax rate by 2 percentage points every year until 2000 to reach a rate of 32% and, thus, its changes were predictable.

3.5 Measure 5 (Oppchgs): Number of changes in tax parameters in opposing directions.

Perhaps a better indicator of tax uncertainty is derived from tracking changes in tax law in opposing directions. Such inconsistency will reduce confidence in the directions that future changes in tax legislation are expected to take. Our final proxy counts the number of changes in opposing directions both of the highest marginal rate and number of separate rates in the profits tax legislation.

4. FDI and Tax Structure: Econometric Specification.

Our dependent variable for the empirical estimation is FDI as a percent of GDP. The source for this and many of the economic control variables discussed below is *Transition Report*, published by the European Bank for Reconstruction and Development (EBRD). This publication offers a data set for transition economies which makes all data directly comparable to the extent that is possible. Often, data on the same series differ substantially depending on the reporting institution. For example, FDI data can be affected by decisions of a country's government on accounting rules for inventory and depreciation, on the recording institutions treatment of work in progress, distinctions between capital alteration and maintenance, etc. We try to minimize such problems by utilizing single sources for all observations. Table 3 shows FDI inflows in the countries in the sample during 1993-1998. The general trend has been towards greater inflows of FDI. Some countries, like Estonia, Hungary, the Czech Republic, and Azerbaijan have received

substantial amounts while others such as Russia, Uzbekistan, and Belarus have received substantially less.

Although our key independent variables are the measures described in the preceding section, we include a number of “control” variables reflecting the determinants of FDI suggested in the literature (see Thornton and Mikheeva, 1996; Kushnirsky, 2001; Bevan and Estrin, 2001; Meyer, 2001). For some of the countries in the region, the oil and gas sector has been a significant attraction to resource-seeking investments resulting in large inward capital flows. For this reason, we construct the dummy variable *Gas*, which takes the value of 1 if a country has substantial reserves of natural gas and oil, zero otherwise. We also include the rate of economic growth, a dummy variable for geographic proximity to countries of the European Union (EU), and openness as measured by trade volume over GDP all of which are expected to have a positive effect on FDI.

Research suggests that capital inflows into transition countries are affected by success in the process of transition. We include in the model the variable *Transition*, a principal component of eight indexes compiled by the EBRD to track the success in transition in the 24 countries we study. The indexes cover success with privatization, price and trade liberalization, financial sector development, and government policy and offer a broad measure of economic and institutional reform. We also control for macroeconomic stability proxied by the log of the annual CPI inflation and the rate of exchange rate depreciation.

We include the highest statutory marginal tax rate as a proxy for relative tax burdens. Finally, lower costs are a prime motivator of resource-seeking investments. We proxy labor costs by per capita GDP in U.S. dollars.⁹

Hausman (1978) specification tests indicate that a random effects specification is appropriate in our analysis, and thus the next section reports random-effects estimates.¹⁰ Ideally,

⁹ There is some ambiguity in what this variable is actually measuring. To the extent that per capita GDP measures economic development, a potential attraction for market seeking FDI, the model would tend to produce a coefficient with a positive rather than negative sign.

¹⁰ The equations were estimated using fixed effects as well. The results were qualitatively similar.

we would want to examine the time series properties of FDI flows for countries and establish whether or not we need to control for serial correlation. Although the short span of the series precludes a formal analysis, visual observation of the data does not suggest that serial correlation is a problem.

5. Empirical Results

5.1 Tax variables

Table 5 reports estimation results for four alternative specifications of the basic regression model discussed in section 4. The first column provides results from a parsimonious specification (model 1), using the number of special tax rates (*Rates*) as the sole complexity variable. Models 2 and 3 include two additional measures of complexity and uncertainty: *Lines* and *Vague*. We also include five additional control variables in model 3. Model 4 is similar to model 3 except we include the complexity and uncertainty variables *Chgs* and *Oppchgs* in place of *Lines* and *Vague*. Results from these four specifications suggest that tax complexity and uncertainty are significant deterrents to FDI.¹¹

The coefficient on the number of special tax rates is negative and statistically significant at the 95 percent confidence level, and the point estimates are robust across alternative specifications. This implies that the imposition of an additional special tax rate reduces FDI as a percent of GDP in these countries by about 0.5 percentage points, on average.

The variable *Lines*, which measures the length of the tax base description, is *positive* and significant in both specifications (models 2 and 3). Although this result appears to counter the hypothesis of the negative effect of tax complexity on FDI flows, one possible interpretation is that it confirms the tension policy makers face in trying to balance complexity and precision in

¹¹ We also evaluated the models with our tax complexity and uncertainty variables lagged one period, but found no results that were qualitatively (or quantitatively in any significant sense) different from those we found using current values.

tax design. More lines in tax legislation may represent more precision rather than more complexity, and we argue that it does. In our estimation, additional precision, as measured by an additional line in the tax base description, leads to an increase in FDI as a percent of GDP of 0.23 – 0.25 percentage points.

As expected, the coefficients on *Vague* were negative, but only marginally significant in one case (model 2) and statistically insignificant in the other (model 3). The magnitude of the coefficient in model 2 is quite large, however, suggesting that ambiguity in the tax law as we measure it (value of *Vague* is 1) would reduce the ratio of FDI to GDP by a substantial 1.5 percentage points relative to the case where there is clarity in the tax law (value of *Vague* is 0).

Finally, the results from model 4 suggest that consistent patterns of tax rate changes (in the sense that changes are in a consistent direction) stimulate FDI, but that tax rate changes in opposing directions repel FDI. By our estimation, a change in tax rates in an opposite direction leads to a substantial 1.5 percentage point decline in FDI/GDP (0.79 – 2.29).¹²

The coefficient for the profits tax rate had its expected negative sign, implying that higher tax rates lead to lower inflows of FDI, but in one case (model 3) the parameter value was not statistically different from zero. By our calculation, an increase in the top tax rate from, say, 20 percent to 30 percent would lead to a 1.2 percentage point decline in FDI/GDP.

Given that the mean value of FDI/GDP across the countries and time period of our analysis is only 2.84 percent (Table 4), our estimates of the effects of tax complexity and uncertainty on FDI/GDP, which range from 0.23 percentage points to 1.5 percentage points, are very substantial. For the average country in the average year, an additional special tax rate would reduce the FDI/GDP ratio from 2.84 to 2.34, while a reversal of the trend in tax rate changes (a change in the opposite direction) would lead to a 51 percent decrease in the ratio, from 2.84 to 1.34. This represents the same impact on FDI/GDP that we estimate would result from an

¹² It should be noted that, with the exception of one country, Russia, all countries experiencing consistent changes experienced consistently downward changes.

increase in the highest profits tax rate of 12.5 percentage points, say from the average 31% to 43.5%. Our analysis suggests that these transition economies, if they are interested in increasing FDI flows relative to the size of their economies, would do well to design a simple tax system where tax liabilities can be gauged with some certainty.

5.2 Additional Factors

The various non-tax factors included in the regression equations proved for the most part to be significant influences on FDI/GDP in these countries, and the parameter estimates were very robust across alternative specifications. The coefficients of variables drawn from standard FDI theory were largely as expected, although not all were measured with significance. We found that oil-and-gas-producing nations (*Gas*) had significantly larger FDI-to-GDP ratios than non-oil-and-gas-producing nations. The average value of FDI/GDP in these nations was higher by a large 4.1 and 8.0 percentage points. The degree of openness in the economy (*Open*) was found to be a positive influence on FDI/GDP although its effect was not as large. An increase in imports or exports as a percentage of GDP of 10% would increase FDI/GDP by 0.2 – 0.3 percentage points. The rate of economic growth (*Growth*), and the existence of a border with an EU nation (*Border*) did not seem to have significant effects on FDI/GDP.

We were initially uncertain about the likely sign of *Per Cap GDP*. The variable came out to be negative and significant, with parameter estimates ranging from – 0.44 to – 0.78. The negative sign suggests that this variable is serving as a proxy for labor costs rather than market size, which would have probably resulted in a positive parameter value.

Turning to our variables measuring success in efforts toward market reform and economic stability, the rate of inflation was found to be negatively related to FDI/GDP. Higher rates of inflation have a significantly negative impact on FDI, which suggests that macroeconomic stability is an important factor in explaining the pattern of FDI across the former communist countries. The average rate of depreciation in exchange rates (*ExRate*) did not seem to have significant effects on FDI/GDP. Also, surprisingly, *Transition*, a broad measure of progress in

economic and institutional reforms, was statistically insignificant in all of the models in which it was included as a regressor. We expected the coefficient on this variable to have been strongly positive and significant, and we suggest that our result may reflect *Transition's* relatively high collinearity with other regressors, specifically *Rates*, *Chgs*, *Per Cap GDP*, and inflation.¹³

6. Concluding Remarks

The countries of ECE and the FSU have been undergoing monumental changes in every aspect of their society and economy. Reforming the tax structure, which is both an important tool for policy and a reflection of ideology, has deservedly occupied substantial attention in that process. Over the last decade the 24 countries studied in this paper have chosen various paths in terms of tax law. The question we address is whether these choices have had an impact on business activity through complexity and uncertainty. In particular, we examine whether complex and uncertain tax structures have reduced the magnitude of foreign direct investment. Our results suggest that a greater number of special provisions and ambiguities in the tax law have indeed had such an impact.

The results suggest that, in the transition economies, more complex and vaguely worded legislation negatively impact on the decisions of firms. This may be due to high compliance costs or simply because it adds to the already high level of uncertainty in that region. Tax complexity may be especially problematic in countries with underdeveloped tax administration which are ill-equipped to clarify and communicate appropriate interpretations of the existing legislation. As tax administrations improve some of these problems with legislation may lessen.

Tax law develops out of a process which seeks to balance conflicting goals, including efficiency, equity, growth, and minimal administrative and compliance costs, among others.

¹³ The correlation coefficients, all of which are statistically significant at the 95 percent confidence level, are -0.70 , -0.63 , 0.65 , and -0.86 , respectively.

Unfortunately, optimal taxes from a theoretical efficiency perspective, which may imply a whole array of different tax rates, may be significantly suboptimal from an administrative/compliance cost perspective.¹⁴ A tax code altered to reflect the desire for economic growth and development in general, and FDI in particular, is likely to raise administrative and compliance burdens *via* increased complexity and uncertainty in the law.

Given the evidence we have presented and analyzed, it is not at all clear that policy makers are aware of and fully recognize the costs of complexity and uncertainty in their deliberations on tax policy. Our results have strong implications for these policymakers as they continue to reform their tax systems. Although complaints about complexity in tax systems are replete, our results show that one must be discerning in how one discusses complexity. Multiple rates and vague language can impose costs on firms and deter business activity. However, a shorter tax code does not necessarily imply a better business environment. If more extensive and detailed tax law provides more precision, it may actually encourage business activity by reducing uncertainty and transactions costs associated with determining tax liability.

Our results also confirm the importance of macroeconomic stability in conjunction with such microeconomic variables as tax design and labor costs on firm decisions on foreign direct investment.

Naturally, we are limited by the availability of published data and by our intent to develop objective measures. Additional information, for example on the costs of compliance, on whether changes in tax rates were planned, and on the effectiveness of tax administration, would enhance our ability to assess the costs of complexity and uncertainty.

¹⁴ Optimal taxes from an efficiency perspective may be suboptimal from an equity perspective as well. The standard result from the optimal commodity taxation literature, for example, suggests that efficiency is maximized when each commodity has a unique rate of taxation that is proportional to the inverse price elasticity. Vertical equity is substantially undermined by this rule, however, as necessities are by their nature highly price and income inelastic, while luxuries are by their nature highly price and income elastic.

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Table 1
 Number of different tax rates and the highest statutory marginal tax rate
 Central and Eastern Europe and the former Soviet Union
 1993-98

Country	Number of different tax rates				Highest Statutory Profits Tax Rate			
	Period average	1993	1998	Changes	Period average	1993	1997	Changes
Albania	2.00	2	0	↑↓	30	30	30	-
Armenia	3.00	2	1	↑↓	28	30	25	↓
Azerbaijan	3.17	6	1	↓↓	33	35	30	↓
Belarus	4.67	4	5	↑	30	30	30	-
Bulgaria	1.83	2	1	-	36	40	27	↓↓
Croatia	0.00	0	0	-	30	25	35	↑
Czech Rep.	0.67	0	1	↑	39	42	35	↓↓↓
Estonia	1.00	1	1	-	26	26	26	-
Georgia	1.17	0	1	↑↓↓	24	32	20	↓
Hungary	1.00	1	1	-	23	36	18	↓↓
Kazakhstan	2.50	3	3	↓↑↑	30	30	30	-
Kyrgyz Rep.	3.00	6	0	↓	33	35	30	↓
Latvia	1.00	3	0	↓	28	35	25	↓
Lithuania	1.00	1	1	-	29	29	29	-
Macedonia	0.00		0	-	15		15	
Moldova	2.00	3	0	↓	32	32	32	-
Poland	0.00	0	0	-	38	40	34	↓↓
Romania	2.00	0	2	↑↑↓	39	45	38	↓
Russian Fed.	3.83	2	5	↑↑	34	35	30	-
Slovak Rep.	0.17	0	1	-	40	40	40	-
Slovenia	0.00	0	0	-	27	30	25	↓
Tajikistan	3.33	6	2	↓↓	40	45	30	↓↑↓
Turkmenistan	3.50	4	3	↓↑↓	25	25	25	-
Ukraine	3.17	6	1	↓↑↓	29	22	30	↑
Uzbekistan	4.17	5	4	↓↓	33	18	33	↑↓↓
Average	1.92	2.4	1.3		31	32.8	28.8	

Source: IBFD, *Central and East European Tax Directory*, various years.

Table 2
 Number of lines describing the tax base and indefinite language in the tax law
 Central and Eastern Europe and the former Soviet Union
 1993-98

Country	Indefinite language			Number of lines describing the tax base		
	Period average	1993	1998	Period average	1993	1998
Albania	0.70	0.7	0.7	7.6	8	6
Armenia	0.67	1.0	0.0	6.8	6	11
Azerbaijan	0.20	0.3	0.0	10.6	9	11
Belarus	1.00	1.0	1.0	9.8	9	10
Bulgaria	1.00	1.0	1.0	12.3	10	13
Croatia	1.00	1.0	1.0	8.1	6	9
Czech Rep.	0.70	0.7	0.7	10.5	7	16
Estonia	0.17	1.0	0.0	5.6	5	6
Georgia	0.75		0.0	7.0		7
Hungary	0.43	0.7	0.3	13.3	11	16
Kazakhstan	0.33	1.0	1.0	6.3	9	7
Kyrgyz Rep.	0.60	1.0	0.0	7.4	9	6
Latvia	0.00	0.0	0.0	6.6	8	6
Lithuania	0.27	0.3	1.0	7.0	6	8
Macedonia	1.00		1.0	8.0		8
Moldova	1.00	1.0	1.0	5.0		
Poland	0.15	0.0	0.3	8.8	7	10
Romania	0.50	1.0	0.0	7.8	6	12
Russian Fed.	1.00	1.0	1.0	12.1	12	12
Slovak Rep.	0.75	0.7	0.7	8.0	8	8
Slovenia	0.05	0.3	0.0	7.6	9	7
Tajikistan	1.00	1.0	1.0	12.1	12	13
Turkmenistan	1.00	1.0	1.0	6.0	6	6
Ukraine	0.80	1.0	0.7	8.0	7	11
Uzbekistan	1.00	1.0	1.0	8.0	8	8
Average	0.64	0.8	0.6	8.4	8.1	9.5

Source: IBFD, *Central and East European Tax Directory*, various years

Table 3
 Foreign Direct Investment as percent of GDP
 Central and Eastern Europe and the former Soviet Union
 1993-98

Country	Foreign Direct Investment as percent of GDP						
	1993	1994	1995	1996	1997	1998	Average
Albania	4.75	2.67	2.89	3.41	1.95	1.50	2.86
Armenia		0.34	0.48	1.10	3.13	7.60	2.53
Azerbaijan		0.60	7.86	16.46	28.40	26.20	15.91
Belarus	0.04	0.08	0.11	0.37	1.40	0.70	0.45
Bulgaria	0.51	1.08	0.69	1.11	4.80	2.80	1.83
Croatia	0.82	0.80	0.56	1.00	2.90		1.22
Czech Rep.	2.10	2.20	5.05	2.54	2.47	4.50	3.14
Estonia	4.04	5.31	4.21	3.44	2.80	10.40	5.03
Georgia		0.23	0.26	0.87	3.60	4.30	1.85
Hungary	6.09	2.76	10.12	4.39	3.70	3.60	5.11
Kazakhstan	0.58	0.93	4.84	5.40	5.96	5.90	3.94
Kyrgyz Rep.	0.23	1.19	2.89	2.58	4.90	3.10	2.48
Latvia	0.85	3.93	2.87	7.44	9.30	3.20	4.60
Lithuania	0.50	0.54	1.05	1.93	3.40	9.20	2.77
Macedonia		1.28	0.67	0.36	0.90	3.70	1.38
Moldova		0.44	0.75	1.46	2.90	5.80	2.27
Poland	1.99	2.03	3.08	3.34	2.20	4.50	2.86
Romania	0.36	1.22	1.28	0.84	3.49	4.70	1.98
Russian Fed.		0.20	0.58	0.58	0.80	0.30	0.49
Slovak Rep.	1.66	1.47	1.05	1.50	0.40	1.20	1.21
Slovenia	0.89	0.89	0.94	0.98	1.60	0.80	1.02
Tajikistan		0.48	0.90	0.80	2.70	1.00	1.18
Turkmenistan				5.90	5.20		5.55
Ukraine		0.17	0.31	1.17	1.20	1.70	0.91
Uzbekistan	0.20	0.24	0.51	0.23	1.20	1.20	0.60
Average	1.60	1.29	2.25	2.77	4.05	4.69	2.83

Source: EBRD Transition Report, various year .

Table 4
Data Descriptions, Sources, and Sample Statistics

Variable	Description	Source	Mean (Std. Dev.)
<i>FDI/GDP</i>	Foreign direct investment as a share of GDP	EBRD <i>Transition Report</i> (various years)	2.840 (3.912)
<i>Rates</i>	Number of special tax rates	Author constructed from IBFD <i>Central and East European Tax Directory</i>	1.966 (1.892)
<i>Lines</i>	Number of lines in tax base description	Author constructed from IBFD <i>Central and East European Tax Directory</i>	8.640 (2.723)
<i>Vague</i>	Ambiguous language in tax law	Author constructed from IBFD <i>Central and East European Tax Directory</i>	0.634 (0.423)
<i>Chgs</i>	Number of changes in tax rates	Author constructed from IBFD <i>Central and East European Tax Directory</i>	3.352 (1.931)
<i>OppChgs</i>	Number of tax rate changes in opposing directions	Author constructed from IBFD <i>Central and East European Tax Directory</i>	0.717 (0.918)
<i>Tax</i>	Highest marginal profits tax rate	IBFD <i>Central and East European Tax Directory</i> (various years)	31.109 (6.471)
<i>Transition</i>	Principle components aggregate of EBRD's (8) Progress in Transition Indicators	EBRD <i>Transition Report</i> (various years)	0.397 (2.250)
<i>Inflation</i>	Log inflation	EBRD <i>Transition Report</i> (various years)	4.047 (2.013)
<i>Per Cap GDP</i>	GDP per capita (Thousands of US\$)	EBRD <i>Transition Report</i> (various years)	2,071 (1,846)
<i>Gas</i>	Dummy variable with value 1 if producer of natural gas	Author constructed	0.200 (0.401)
<i>Open</i>	Imports + exports as a percent of GDP	WB <i>World Development Indicators, 2001</i>	91.988 (30.952)
<i>Growth</i>	Percentage change in GDP from previous year	WB <i>World Development Indicators, 2001</i>	- 1.059 (8.440)
<i>ExRate</i>	Average rate of depreciation in exchange rate	WB <i>World Development Indicators, 2001</i>	1.225 (1.635)
<i>Border</i>	Dummy variable with value 1 if borders an EU member country	Author constructed	0.440 (0.498)

Table 5
Tax structure and FDI.
Central and Eastern Europe and the former Soviet Union,
1993-98

	Dependent variable: Annual inflows of Foreign Direct Investment as percent of GDP			
	(1)	(2)	(3)	(4)
Number of special tax rates (<i>Rates</i>)	-0.49*** (0.17)	-0.46** (0.21)	-0.54** (0.22)	-0.50*** (0.19)
Number of lines in tax base description (<i>Lines</i>)		0.25** (0.11)	0.23* (0.12)	
Ambiguous language in tax law (<i>Vague</i>)		-1.51* (0.81)	-0.87 (0.89)	
Number of changes in tax parameters (<i>Chgs</i>)				0.79* (0.41)
Number of changes in opposing direction (<i>Oppchgs</i>)				-2.29** (0.90)
Real per capita GDP in thousands US\$ (<i>Per cap GDP</i>)	-0.44 (0.27)	-0.66*** (0.22)	-0.66*** (0.29)	-0.72** (0.30)
Imports plus exports as percent of GDP (<i>Open</i>)	0.02** (0.01)	0.03** (0.01)	0.02* (0.01)	0.03* (0.01)
<i>Gas</i>	5.10*** (1.50)	4.68*** (1.13)	4.41*** (1.31)	3.53*** (1.40)
Logarithm of annual percentage changes in the CPI (<i>Inflation</i>)	-0.95*** (0.15)	-0.91*** (0.17)	-0.89*** (0.26)	-0.97*** (0.24)
A principal component of EBRD transition indexes (<i>Transition</i>)			0.01 (0.31)	0.04 (0.28)
Percentage change in real per capita GDP (<i>Growth</i>)			0.02 (0.05)	0.01 (0.04)
Exchange rate changes (<i>ExRate</i>)			0.28 (0.36)	0.55 (0.36)
Profits tax rate (<i>Tax</i>)			-0.05 (0.06)	-0.12* (0.06)
<i>Border</i>			0.26 (1.51)	-0.01 (1.48)
Constant	4.77 (1.58)	4.06 (1.71)	5.65 (3.05)	7.99 (2.86)
Overall R ² (R ² within)	0.33 (0.36)	0.43 (0.35)	0.46 (0.37)	0.48 (0.37)
Number of observations	131	123	120	128

Notes: standard errors in parentheses. ***(**,*) indicate significance at the 1 (5, 10) percent level.

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