The effect of corporate taxes on investment and entrepreneurship[1]

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Abstract

We present new data on effective corporate income tax rates in 85 countries in 2004. The data come from a survey, conducted jointly with PricewaterhouseCoopers, of all taxes imposed on "the same" standardized mid-size domestic firm. In a cross-section of countries, our estimates of the effective corporate tax rate have a large adverse impact on aggregate investment, FDI, and entrepreneurial activity. For example, a 10 percent increase in the effective corporate tax rate reduces aggregate investment to GDP ratio by 2 percentage points. Corporate tax rates are also negatively correlated with growth, and positively correlated with the size of the informal economy. The results are robust to the inclusion of controls for other tax rates, quality of tax administration, security of property rights, level of economic development, regulation, inflation, and openness to trade.

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I. Introduction

The effect of corporate taxes on investment and entrepreneurship is one of the central questions in both public finance and development. This effect matters not only for the evaluation and design of tax policy, but also for thinking about economic growth (see Barro 1991, DeLong and Summers 1991, and Baumol, Litan, and Schramm 2007).

Starting with Hall and Jorgenson (1967), many public finance economists have addressed this topic. A small selection of important studies includes Summers (1981), Feldstein, Dicks-Mireaux and Poterba (1983), Auerbach (1983), King and Fullerton (1984), Slemrod (1990), Auerbach and Hassett (1992), Hines and Rice (1994), Cummins, Hassett, and Hubbard (1996), Devereux, Griffith, and Klemm (2002), and Desai, Foley, and Hines (2004b). Auerbach (2002), Gordon and Hines (2002), Hasset and Hubbard (2002), and Hines (2005) survey aspects of this literature. Generally speaking, this research finds adverse effects of corporate income taxes on investment, although studies offer different estimates of magnitudes.

In this paper, we present new cross-country evidence on the effects of corporate taxes on investment and entrepreneurship. The evidence comes from a newly-constructed data base of corporate income tax rates for 85 countries in 2004. We seek to contribute to the literature in three ways.

First, we use new data for a large cross-section of countries. Most cross-country studies focus on either some or all of the OECD countries (see especially King and Fullerton 1984 and Devereux et al. 2002), and hence do not provide nearly as much information about the developing world.

Second, we construct a new database of corporate (and other) tax rates that are *comparable* across countries. Our data, assembled jointly by the World Bank, PricewaterhouseCoopers, and Harvard University, come from a computation of all relevant taxes applicable to *the same* hypothetical domestic enterprise, called TaxpayerCo, operating in each country. In many instances, these rates differ sharply from statutory corporate tax rates. At the same time, our data are limited in that we do not collect information on taxes paid by individuals[2].

Third, in addition to standard data on aggregate and foreign direct investment (FDI), we put together new data on entrepreneurship. We use new data on business density and a new 62 country data set on firm entry. These data enable us to assess the effects of corporate taxes on entrepreneurship and not just investment.

The principal corporate income tax measure we use is the effective tax rate that TaxpayerCo pays if it complies with its country's laws, defined as the actual corporate income tax owed by the company relative to pre-tax profits. Since TaxpayerCo is a new company, we compute both the 1st year effective tax rate, and the 5-year tax rate taking account of the present value of depreciation and other deductions. Our data reveal a consistent and large adverse effect of corporate taxes on both investment and entrepreneurship. A 10 percentage point increase in the 1st year effective corporate tax rate reduces the aggregate investment to GDP ratio by about 2 percentage points (mean is 21%), and the official entry rate by 1.4 percentage points (mean is 8 %).

To check the robustness of our results, we consider several additional potential determinants of investment and entrepreneurship. These include other taxes, including

[2] We check the robustness of our results to the inclusion of personal tax rates, but do not pursue an integrated analysis of personal and corporate taxes (see, e.g., Auerbach 1979 and Graham 2003).

additional taxes imposed on the firm as well as the VAT and the personal income tax, measures of the cost of tax compliance, assessments of security of property rights, economic development, regulation, openness to trade, and inflation. Some of these factors affect some measures of investment and entrepreneurship, but they do not eliminate the large adverse effect of corporate taxes.

We also consider the effects of corporate taxes on other important outcome variables. We find a negative correlation between our measures of effective tax rates and recent growth in cross-country data. We also find that higher corporate taxes are associated with a larger informal economy. This suggests that an important margin on which corporate taxes influence economic activity is by keeping activity informal. Last, our data enable us to ask, in a cross-country context, whether corporate taxes encourage debt as opposed to equity finance (see Modigliani and Miller 1958, Auerbach 1979, Miller 1977, Graham 1996, Mackie-Mason 1990, Desai, Foley, and Hines 2004a). We find a large and significant positive association between the effective corporate tax rate and the aggregate debt to equity ratio.

The next section of the paper describes our data. Section 3 presents some sample computations and summary statistics. Section 4 presents the basic results on corporate taxation, investment, and entrepreneurship. Section 5 concludes.

II. Data

We collect our data through a survey of PricewaterhouseCoopers accountants and tax lawyers on the taxes paid by a standardized business. Two rounds of the survey were conducted, in January 2005 and 2006. This paper uses data covering the tax system

effective in fiscal year 2004[3]. In-depth conference calls were held with all respondents to confirm the data. Responses were also verified with tax laws and tax information published by the International Bureau of Fiscal Documentation.

The sample consists of 85 countries covered by Djankov et al (2002). It includes 27 high income, 19 upper-middle income, 21 lower-middle income, and 18 low income countries. In addition to 22 rich OECD countries, 10 are in East Asia, 17 are in Eastern Europe, 13 in Latin America, 6 in the Middle East, 14 in Africa, and 3 in South Asia.

The data are constructed using a standardized case study of a business called "TaxpayerCo." TaxpayerCo is a taxable corporation operating in the most populous city in the country. It is liable for taxes charged at the local, state/provincial, and national levels. It is 100% domestically and privately owned and has 5 owners, none of whom is a legal entity. TaxpayerCo performs general industrial/commercial activities: it produces ceramic flower pots and sells them at retail. It does not engage in foreign trade or handle products subject to a special tax regime.

TaxpayerCo employs 60 people: 4 managers, 8 assistants and 48 workers. All are nationals and were hired on January 1st. One of the managers is also an owner. Employees of the same hierarchical status earn the same wage. All employees are younger than 40 years and all workers are younger than 26 years. All employees worked and earned the same salary the year before and none of the employees is disabled. Managers became subject to social security taxes prior to 1993 while assistants and workers only became subject to social security taxes after 1993.

[3] The survey presents respondents with financial statements for calendar year 2004. We always consider the data for calendar year 2004, even when fiscal year is different from calendar year.

The company started operations on January 1st 2004. On the same date, it bought all the assets. It owns one plot of land, a building, machinery, one truck, 10 computers and other office equipment. The building is used for production, storage and offices. It has 10,000 square feet of floor space on a 6,000 square foot land plot. The machinery is classified as light machinery for tax purposes. The value of computer assets is equally divided between hardware and software. Other office equipment is composed of standard office tables, chairs, one copier, one fax machine, one scanner and 10 phones.

Respondents were presented with TaxpayerCo's financial statements and a list of transactions as if TaxpayerCo was operating in a tax free world. All variables in the financial statements provided to respondents are a simple multiple of the country's income per capita in the local currency unit (from the World Bank).

The multiples used for the pre-tax financial statements variables, along with the example of the actual values for the U.S., are described in Table 1. Panel A describes the balance sheet, and Panel B the profit and loss statement. The multiples were chosen to be typical for a mid-size manufacturing firm. We told the respondents that TaxpayerCo keeps 50% of after-tax profits as retained earnings and distributes the other 50% as dividends. In a tax-free world, retained earnings are then half of pre-tax earnings (equal to 79 times GNI per capita per Table 1), or 39.5 times GNI per capita. However, the actual amount of retained earnings is a function of the tax system and, therefore, it is not included in the pre-tax Table 1.

With this information, PwC respondents in each country calculate the taxes that TaxpayerCo must pay in its first year of operation. Respondents provide the full tax

schedules for corporate income taxes[4], labor taxes[5] for which the statutory incidence is on the employer, property tax, asset and capital tax, turnover tax, business license tax, financial transactions tax, but also VAT and sales taxes. Taxes at all levels of government are considered. Our analysis focuses on corporate income taxes, although we use the additional information provided by PwC for robustness checks[6].

Respondents describe all applicable deductions and exemptions. They inform us of the full depreciation schedule for all assets, so we can compute depreciation for TaxpayerCo. Respondents also record the deductibility of advertising expenses, machinery repair expenses, interest expenses, and of each applicable tax.

For each tax, PwC respondents further describe the frequency and the process for payment, e.g., whether the tax can be paid electronically or whether it requires payment in person. The time it takes to prepare, file and pay TaxpayerCo's taxes is also recorded.

Tax variables

Table 2 describes the main variables. We start with the tax variables, and divide their presentation into three groups: corporate income tax measures, other tax measures, and tax administration measures. We compute three corporate income tax rate variables:

[4] All taxes levied on corporate income are considered corporate income taxes for the purposes of this analysis, regardless of the name given to them.

[5] All charges levied on labor for which the statutory incidence is on the employer are considered labor taxes, whether they are called labor taxes, social security contributions, or something else, whether they are requited or unrequited, and whether they are paid to a public or private agency. We try to unbundle the mandatory accident insurance contribution from the labor taxes. Wherever we can obtain information on the contribution rate for the mandatory accident insurance contribution, we do not include it in the labor taxes to be consistent across countries. Many countries only mandate that employers have an accident-at-work insurance in place for their employees, but we could not find rates applicable to TaxpayerCo.

[6] We do not have enough information to integrate personal income and dividend taxes with corporate income taxes. We do not consider minor taxes, such as waste collection and vehicle taxes. Taxes on real estate transactions and capital gains taxes are not included because they do not come up in the case facts.

the first is the traditional statutory corporate income tax rate, while the remaining two are based on the actual taxes owed by TaxpayerCo as computed from survey responses.

1. Statutory corporate tax rate. This is the tax rate a company has to pay on marginal income assuming that it is in the highest tax bracket, taking into account federal, state, and local rates. We account for the deductibility of some taxes for the purposes of calculating others. In Switzerland and the U.S., for example, state income taxes are deducted from the federal income tax base[7].

2. 1st year effective corporate tax rate. This is the actual first year corporate income tax liability of TaxpayerCo relative to pre-tax earnings (79 times GNI per capita per Table 1), taking account of all available deductions. Appendix A illustrates the exact steps used in the calculation of this tax variable, and the next, for the case of Argentina.

3. 5-year effective corporate tax rate. This rate takes account of actual depreciation schedules going 5 years forward. We discount both taxes and profits at 8 percent[8]. The numerator is the present value of actual corporate tax liabilities of TaxpayerCo over 5 years, where only depreciation deductions change over time. The denominator is the present value of pre-tax earnings, assumed to be the same every year.

The effective corporate tax rate, both in its 1st year and 5-year versions, does not fully reflect all the complexities that public finance theory suggests are relevant to corporate decision-making (see, e.g., King and Fullerton 1984). Our measures have the advantage of extreme simplicity and transparency, and may plausibly correspond to what

[7] It is possible that TaxpayerCo faces a lower statutory tax rate than the maximum. We computed the statutory corporate income tax rate applicable to TaxpayerCo. Worldwide, it is 1.5 percentage points lower on average than the maximum rate, but across countries is very highly correlated with the highest statutory rate. We have run our regressions using the statutory rate applicable to TaxpayerCo, and they are generally weaker than those for other rates. We therefore do not discuss this particular rate any further in the paper.

[8] In our main calculation of the 5-year effective tax rate, we do not take inflation into account. However, in our robustness checks, we both control for inflation and consider the effect of non-indexation of depreciation deductions, emphasized by Auerbach and Jorgenson (1980).

profit-maximizing entrepreneurs look at when they evaluate investments. Our data can also be used to compute other tax rates. We seek to present the basic ingredients of the computation of corporate taxes for a large number of countries, and to see whether, in their simplest form, they influence investment and entrepreneurship.

PwC has previously published statutory rates for multiple countries, which have been used by researchers. PwC and the World Bank *Doing Business* project have also published total tax rates on firms for 2004, 2005, and 2006 from the same survey as we use in this paper. These reports cover more countries, but do not compute effective corporate tax rates, or engage in the same amount of checking as we do for our data.

In addition to the corporate taxes, we use four other tax rates as *control variables*, the first three of which come from our survey, and the last from other PwC data:

4. Labor tax. This is the sum of all labor-related taxes payable by TaxpayerCo, including payroll taxes, mandatory social security contributions, mandatory health insurance, mandatory unemployment insurance, and any local contributions that depend on the payroll or number of employees. Because our research design focuses on firms and not on their shareholders, only taxes where the statutory incidence is on the employer are included, and we use the first year of operations. The denominator is pre-tax earnings of TaxpayerCo.

5. Other taxes. This is the sum of all taxes payable by TaxpayerCo in the first year of operation that enter the profit and loss statement where the statutory incidence is on the firm, other than corporate income and labor tax. It is the sum of all property taxes, business license taxes, financial transactions and asset and capital taxes payable by TaxpayerCo. The denominator is pre-tax earnings of TaxpayerCo.

6. VAT and Sales Tax. This is the sum of all consumption tax rates for taxes payable or collected by TaxpayerCo, including the value added tax, the sales tax, the turnover tax, and any related surtaxes. 82 of the 85 countries in our sample have VAT[9]. For countries that have multiple VAT rates, we use the rate applicable to TaxpayerCo, i.e, to ceramic goods. Only 5 countries in our sample have a sales tax collected by TaxpayerCo, and that is what we use.

7. Personal Income Tax. This is the highest bracket marginal personal income tax rate in 2004. We only include the tax at the national level.

In addition to these 7 tax rates, we use two measures of the burden of tax administration. The first is the number of tax payments made by TaxpayerCo in a fiscal year. The tax payments indicator reflects the actual number of taxes paid, the method of payment, the frequency of payment, and the number of agencies involved for TaxpayerCo during the second year of operation. It covers payments made by the company on consumption taxes, such as sales tax or value added tax (which are traditionally withheld on behalf of the consumer), as well as profit, labor, property and other tax payments. Where full electronic filing is allowed, the tax is counted as paid once a year even if the payment is more frequent. In Hong Kong, TaxpayerCo pays 4 times per year; in Mali, it pays 60 times per year.

The second measure of tax administration is the time to comply, recorded in hours per year. The indicator measures the time to prepare, file and pay (or withhold) three major types of taxes: the corporate income tax, value added or sales tax, and labor taxes, including payroll taxes and social security contributions. Preparation time includes the time to collect all information necessary to compute the tax payable. If separate

[9] Controlling for VAT also helps address the Hall-Rabushka (1985) tax equivalence concerns.

accounting books must be kept — or separate calculations must be made — for tax purposes, the time associated with these activities is included. Filing time includes the time to complete all necessary tax forms and make all necessary calculations. Payment time is the hours needed to make the payment online or at the tax office. When taxes are paid in person, the time includes delays while waiting. In Armenia, it takes TaxpayerCo 1120 hours per year to fulfill all tax requirements; in Ireland, it takes 76 hours per year.

Outcome Variables

We primarily analyze the effect of corporate taxes on aggregate investment and entrepreneurship. We use two measures of investment: gross fixed capital formation and foreign direct investment, both as a percentage of GDP, both from the World Bank. We use the average of this ratio over 2003-2005. Foreign Direct Investment (FDI) is the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor. We use the average of the FDI to GDP ratios over 2003-2005[10].

We also examine two measures of entrepreneurship: the number of business establishments and the rate of new business registration. The data are collected from national statistical offices and company registrars. The data cover the period from 2000 to 2004. The business density measure is defined as the number of registered establishments per 100 members of working population as of 2004; business registration ("entry") is defined as the average 2000-2004 ratio of business registrations over the number of business establishments.

[10] World Banks' FDI numbers include considerable financial flows. Also, to the extent that these are net inflows, they are lower for countries that make significant investments abroad, such as Ireland.

The data on business establishments do not cover self-employment. For example, there are 7.2 million registered businesses in the United States that employ at least one worker. There are another 15.1 million businesses that do not employ a single worker other than the owner. The latter are not included in the business density measure. In many sample countries, such businesses are not required to register with the company registrar, which makes it is impossible to collect comparable data.

The fact that we use aggregate measures of investment and entrepreneurship leads to two conceptual problems. First, the rates we compute might be different from those faced by firms undertaking the bulk of aggregate investment (which are surely older and larger). Second, many entrepreneurial firms might be smaller than TaxpayerCo, and not even organized as corporations, which would again point to a mismatch between our tax and entrepreneurship variables (Goolsbee 1998). In reality, most countries do not have large differences in the taxation of firms using different organizational forms. Our robustness checks address some aspects of mismatch. If our tax measures are irrelevant for investment and entrepreneurship, we should not expect them to have an effect.

We examine four additional outcome variables: GDP growth (calculated over 1996-2005 and over 2001-2005), the size of the informal economy, estimated as the percentage of activity that is unofficial or unregistered (from surveys by the World Economic Forum in 2005 and 2006), and the average debt to equity ratio from the IMF.

Control Variables

We are principally interested in the effects of our four measures of corporate income tax on investment and entrepreneurship. Since we estimate simple cross-country

regressions, there is always a risk that the correlations we document are spurious. To partially address this risk, we control for many factors in the regressions. These include the additional tax and tax compliance variables described above, as well as other variables. We define those in Table 2, but summarize the economic issues here.

First, one might worry that the overall quality of institutions affects investment and entrepreneurship. To address this concern, we control in the robustness checks for lagged per capita income and for several survey assessments of institutional quality that are common in cross-country empirical work. Second, recent research suggests that government regulations, such as those of entry (Djankov et al. 2002) and labor markets (Botero et al. 2004), affect investment and entrepreneurship[11]. We check the robustness of our results to the inclusion of these variables. Third, theory predicts that inflation might influence investment, partly though its impact on the cost of capital (Auerbach and Jorgenson 1980). We control for the average 2000-2004 inflation. Finally, a country's openness to trade may influence investment and FDI; we check if it does.

III. A look at the data

Table 3 presents the means of tax, tax administration, investment, and entrepreneurship, and other outcome variables by income group. Several interesting findings emerge from these data. First, the world-wide average statutory corporate tax rate is about 29%, and does not vary much across income groups. Nonetheless, there is large variation among countries. The statutory rate is 12.5% for Ireland, 15% for Latvia, Lithuania, and Lebanon, and over 40% for Pakistan, Japan, and the United States.

[11] Examples of studies examining the effects of these measures of regulation on unemployment, labor reallocation, investment, and firm entry include Alesina et al. 2005, Haltiwanger et al. 2006, Klapper et al. 2006, and Ciccone and Papaioannou 2006.

Second, in our sample, the world average 1st year effective corporate tax rate, at 17.5%, is 11.5% lower than the average statutory tax rate. Upper middle income countries have lower 1st year effective rates than other groups, but otherwise variation across income groups is small. Again, there is significant variation among countries. In the first year of operation, TaxpayerCo faces zero effective corporate tax rate in Hong Kong and Mongolia, but 31% in Pakistan and nearly 40% in Bolivia.

Third, the 5-year effective corporate tax rate is only about 2 percentage points higher than the first year one, on average, with similar patterns across income groups. We no longer have zero rates, but Mongolia has 6.6% and Lithuania 7.3%.

Our data are probably least appropriate for measuring the labor tax, since we have data on taxes paid by firms but not by individuals. At the corporate level, the world-wide labor tax is around 15%, with low income countries having somewhat lower rates. Other taxes are under 2% on average, and do not vary significantly by income level. However, they are as high as 17.6% in Bolivia and 14.5% in Argentina.

The combined VAT and sales tax rate averages at 17%, and does not vary much across income groups. It hits the low of zero in Hong Kong, and the high of 73.5% in Brazil, although the second highest country is Hungary at 27.2%. The highest personal income tax rate averages 33.5% in the world, and is sharply higher in the rich than in the middle income countries. The rate is as high as 60% in Vietnam and 59% in Denmark, and as low as zero in Uruguay and 11.5% in Switzerland.

Our measures of tax administration for TaxpayerCo vary hugely by income level. The average annual number of all corporate tax payments is 35, ranging from 16 for high income countries to 48 for lower middle income countries, and 44 for poor countries.

Norway has 3 tax payments a year, Hong Kong has 4, but Romania has 89 and the Ukraine 98. Some of the higher number of payments is related to the greater number of "other taxes" and the absence of electronic payments.

When it comes to the amount of time TaxpayerCo spends to comply with taxes, the world-wide average is 406 hours per year, but it varies from 229 hours for rich countries to 640 hours for lower middle income countries (and 425 hours for poor countries). TaxpayerCo in Singapore would spend 30 hours a year complying with taxes; TaxpayerCo in Switzerland would spend 63. The corresponding numbers are 2185 hours in the Ukraine and 2600 hours in Brazil. Part of the burden of taxation in poorer countries clearly comes from administration, and not just rates[12].

Over 2003-2005, the world-wide average investment to GDP ratio is about 21%, and is not substantially different across income groups. There is significant variation across countries: investment to GDP ratio is above 30% in Jamaica, Mongolia, Vietnam, and of course China (40.8%). In contrast, investment to GDP ratio is the lowest, at below 15%, in Uruguay, Bolivia, Malawi, and the Kyrgyz Republic. Relatively little of that investment is FDI, although several authors consider FDI numbers to be more accurate than overall investment numbers. The World Bank ratio of Foreign Direct Investment to GDP averages to 3.36% between 2003 and 2005, and appears to be somewhat higher for the middle income than for the rich and the poor countries. Ireland, Denmark, and Bolivia have the lowest FDI numbers, Lebanon, Singapore, and Hong Kong the highest.

Business density relative to active population is a somewhat unusual measure of entrepreneurship, but might be a reasonable one. The variable plausibly declines from

[12] The high correlation of our measures of tax compliance with per capita income and legal origins (see below) raises the concern that these measures reflect the quality of government more broadly rather than merely the costs of tax compliance (see La Porta et al. 1999).

7.63 businesses per 100 workers for high income countries to 1.08 for low income countries, which might reflect both fewer businesses at lower levels of development, and presumably fewer *official* businesses. The data point to .004 businesses per 100 workers in Burkina Faso, .04 in Senegal, but rising all the way to 15 in Malaysia and 16 in Sweden. The rise of business density with income is statistically significant. This measure of entrepreneurship is available for 80 countries.

We assemble data on entry, defined as the number of newly registered firms, as a percentage of the stock of such firms, for 62 countries (averaged over 2000-2004). The world-wide average entry rate is about 8.1%, and tends to be somewhat higher for the rich and upper middle income countries (8.8% and 9.1%, respectively) than for the lower middle income and poor countries (7.3% and 6.4%, respectively). The difference in entry rates between the high and the low income countries is statistically significant. The entry rates are as low as 2% in the Philippines, 3% in Peru, Sri Lanka, and Japan, and as high as 15% in Kazakhstan and 16% in New Zealand.

In addition to the four measures of investment and entrepreneurship, we have four additional outcome variables. The world grew at 3% in the relevant period, with middle income countries growing faster than either the rich or the poor. Informal economies are huge, reaching around 35 percent in lower middle and low income countries. Debt to equity ratios are much higher in the richer than in the poorer countries.

Table 4 presents the same variables as Table 3, except it organizes them by legal origin of national commercial laws rather than per capita income. In earlier work, legal origin has been found to be a strong predictor of national regulatory strategies, with civil law (particularly French civil law) countries providing less market-friendly regulation

than common law countries (see LaPorta et al. 2008 for an overview). Here we check whether our variables vary significantly by legal origin.

There is no evidence that statutory corporate tax rates vary by legal origin, although there is some evidence that German legal origin countries (several of which are in East Asia and Eastern Europe) have lower 1st year effective rates. There is also weak evidence that, for the 5-year effective corporate tax rates, common law countries have 3% higher rates, on average, than French civil law countries. The labor tax is higher in civil law countries, although this might merely reflect the fact that these countries impose labor taxes on firms rather than individuals. French legal origin countries also have higher levels of "other taxes," although the difference is not statistically significant. Civil law countries also have a higher rate of VAT and sales taxes than common law countries do. Highest bracket personal income tax rates do not vary much by legal origin.

For tax administration, French legal origin countries exhibit sharply higher numbers of tax payments and time to comply with taxes than other legal traditions (particularly common law). This result is consistent with the finding of higher formalism and burden of government regulation in the French legal origin countries (Djankov et al 2002, 2003, La Porta et al. 2008). There is not much difference in overall investment, FDI, or entrepreneurship rates among legal origins. Finally, there is some evidence that French civil law countries have larger informal economies than do common law ones.

IV. **Results**

We first show the basic relations between corporate taxes and investment and entrepreneurship, then check their robustness, and finally look at other outcomes.

Basic Results

Table 5 presents our main findings; Figures 1-4 illustrate them. We use the four measures of investment and entrepreneurship as dependent variables, and the three corporate tax rates as independent variables, for a total of 12 specifications. In Table 5, we use no controls. The results for the statutory tax rate are similar to those for effective rates in both the magnitude and the statistical significance (except for aggregate investment). Also, the results for the 1st year and 5-year effective corporate income tax rates are very similar (the two rates are correlated at .92). For these reasons, in interpreting the results, we focus on the 1st year effective tax rate.

The results show no statistically significant effect of the statutory tax rate on investment, but a large effect of that rate on FDI. The effects of effective rates on both investment and FDI are statistically significant and larger than those of statutory rates. The estimates indicate that raising the 1st year effective tax rate by 10 percentage points reduces the investment rate by 2.2 percentage points (average investment rate is 21.5%) and FDI rate by 2.3 percentage points (average FDI rate is 3.36%)[13].

The effects of taxes on entrepreneurship are large and statistically significant, and show up with both the statutory and the effective tax rates. A 10 percentage point increase in the 1st year effective corporate tax rate reduces business density by 1.9 firms per 100 people (average is 5), and the average entry rate by 1.4 percentage points (average is 8)[14].

[13] Our estimates are larger, but in the same ballpark, than those of Desai, Foley, and Hines (2004b), who use a different methodology. We also examined the effects of taxation on the aggregate capital labor ratio, updating Caselli and Feyrer (2007) to 2003 and 2004. We did not find any significant results.

[14] Some studies examine the effect of personal income taxes on entrepreneurial activity in the United States, and finds significant effects. See, e.g., Gentry and Hubbard (2000) and Cullen and Gordon (2007).

Robustness

The magnitude of the effects documented in Table 5 is large, and raises obvious questions about spuriousness. In this subsection, we add one at a time a variety of variables to the specifications in Table 5 to verify whether the results are robust[15].

First, we add other tax variables. Labor taxes do not enter statistically significantly, and do not affect the coefficients on corporate tax variables (results not presented). As Table 5a shows, "other taxes" have large adverse effects on investment and business density, especially in specifications with the statutory corporate tax rate. The addition of these tax rates to the regressions marginally reduces but far from eliminates the adverse effects of corporate income tax. One possible reason that "other taxes" matter so much is that the countries that have trouble collecting ordinary taxes, perhaps for reasons of administrative failure, impose them at higher rates.

Table 5b adds VAT and sales tax to the regressions. Its effect is negative but relatively small, and only significant for the FDI regressions. Table 5c adds the highest national rate of personal income tax. The variable does not have much of an effect on corporate income tax coefficients. Personal income tax does not enter the entrepreneurship regressions (which alleviates the concern that our corporate tax rates are "wrong" for entrepreneurship), enters negatively and significantly the FDI regressions (although with small coefficients), and surprisingly enters positively and significantly for aggregate investment. The last result is a fluke caused by China and Vietnam, which have both very high personal tax rates and investment rates. Without them, there is no relationship. Overall, our main findings on corporate income taxes are robust to the inclusion of any of the additional tax rates we have considered.

[15] One observation that looks very influential in Figures 1-4 is Bolivia. The results are robust to omitting it.

When we add the logarithm of time to comply with taxes, it only adversely affects business density (not presented). This result does not survive the additional inclusion of per capita income (both business density and time to comply with taxes are highly correlated with the level of development). When we add the logarithm of the number of tax payments in Table 5d, it has no effect on investment and FDI, but it does negatively affect both business density and entry (and this result survives the inclusion of per capita income). This finding shows that administrative burdens, or perhaps the low quality of government more generally, deter entrepreneurship. The coefficients on corporate income tax variables are not significantly affected by these additional controls.

Next, we control for the quality of institutions. We do this in three ways: lagged per capita income, which might also capture other sources of heterogeneity, survey assessments of institutional quality, and objective measures of regulation. Table 5e presents the results with the log of 2003 per capita income as a control. This variable has no effect on investment or FDI, but does have a large and positive effect on our two measures of entrepreneurship. It does not, however, materially affect the coefficients on corporate tax rates. Table 5f alternatively controls for the Index of Economic Freedom (IEF) Property Rights Index. Greater perceived security of property rights has a positive effect on our two measures of entrepreneurship, but none on our two measures of investment. The coefficients on corporate tax rates do not change much. We have tried several other perception-based measures of the quality of the legal system and property right protection, with similar results. Controlling for property rights does not change our findings on corporate taxes.

In Table 5g, we control for the number of procedures it takes to start a business from the *Doing Business* update of Djankov et al. (2002). The impact of the 1st year effective corporate tax rate on investment and entrepreneurship is not materially affected by this control. Entry regulation does not affect investment, but has a significant adverse effect on the entry rate. An extra procedure reduces the entry rate by roughly .32 percentage points, so going from barely regulated to most regulated countries would reduce the entry rate by as much as 5 percentage points per year.

In Table 5h, we control for a measure of another regulation that might deter investment and entrepreneurship, namely the employment rigidity index from the *Doing Business* update of Botero et al. (2004). Including the index has a minor influence on the magnitude of tax effects. At the same time, employment regulation adversely affects FDI and to a lesser extent business density and entry.

Finally, we consider two additional controls that might influence investment and entrepreneurship. A large literature argues that inflation has an adverse effect on investment, in part because depreciation deductions are not indexed (e.g., Auerbach and Jorgenson 1980, Summers 1981). In Table 5i we add the average 2000-2004 inflation as a control. In this cross-sectional context, inflation has no effect on investment, FDI, or entry. It does have an adverse effect on business density, although this is partly an artifact of both variables being correlated with per capita income (inflation loses significance once per capita income is controlled for). The inflation variable does not materially affect the coefficients on the measures of corporate income tax. As an additional check, we have also computed the 5-year effective corporate tax rate allowing TaxpayerCo's revenues and costs, but not depreciation deductions, to rise with inflation.

This inflation-adjusted 5-year effective corporate tax rate was correlated with the not inflation-adjusted one at 99%. The results using this rate were virtually identical, and so are not reported. In this time of low world-wide inflation and this cross-country context, then, we do not find evidence that inflation has much influence on investment.

One might also argue that investment and entrepreneurship are influenced by a country's openness to trade. In Table 5j, we include the Economic Freedom of the World (EFW) freedom to trade internationally index in the regressions. The index does not matter for investment, but has a predictable positive effect on FDI, business density, and entry[16]. The inclusion of the index does not materially affect the large adverse effects of corporate taxes on FDI and entry, although it does eliminate the significance of the effect on business density.

So what is the bottom line of these robustness checks? Our empirical design can never entirely eliminate the concern that some other factor correlated with the corporate tax rate influences investment. However, having tried a range of possible theories, we have not found what that factor might be. While several of the many factors we consider affect investment and/or entrepreneurship, none substantially diminishes the influence of the effective corporate tax rate. According to the evidence we have presented, corporate taxes have a substantial adverse effect on investment and entrepreneurship.

Other Outcomes

In Table 6, we look at other outcome measures (Figures 5-8 illustrate the results). Corporate taxes have a large and statistically significant adverse effect on the average growth rate over both 1996-2005 and 2001-2005. We estimate that a 10 percentage

[16] We have tried other measures of openness to trade, with similar results.

point increase in the 1st year effective tax rate reduces the growth rate by around 1 percentage point per year. These regressions include initial per capita income, inflation, and three regional dummies (Africa, East Asia, and Latin America).

We also look at the effect of corporate taxation on the size of the informal economy, since one of the principal ways in which taxes might deter official entry or official investment is by keeping firms in the informal sector. A 10 percentage point increase in the 1st year effective tax rate raises the informal economy as a share of economic activity by 2 percentage points. Consistent with Johnson, Kaufmann, and Shleifer (1997) and Schneider (2005), taxes are an important reason firms stay unofficial.

This result has important implications for our findings on the large adverse effects of corporate income taxation on investment and entrepreneurship. The measures of investment, FDI, business density, and entry we use all reflect formal economic activity. Corporate taxation might affect these measures either by reducing total activity or by keeping it informal. The finding on the informal economy suggests that at least part of the adverse effect of taxation is to keep economic activity, such as investment and new business formation, informal, rather than to eliminate activity altogether. It is difficult to say, given the available data, how much corporate income taxation reduces economic activity, and how much it merely reallocates activity between formal and informal sectors. One highly relevant piece of data, however, is that corporate taxation has a large adverse effect on FDI. Since virtually all of total FDI is likely to be formal, it seems likely that corporate income taxation diminishes aggregate investment and entrepreneurship, and not only reallocates them between the formal and informal sectors.

The final regressions ask whether corporate taxes encourage the use of debt finance, since interest payments are universally tax-deductible. A 10 percentage point increase in the 1st year effective corporate tax rate raises the debt to equity ratio by highly statistically significant 45 percentage points (the mean is 111%). In our data, countries with higher effective (as well as statutory) tax rates use sharply more debt. This result is consistent with just about every theory of optimal capital structure (Graham 2003).

V. Conclusion

This paper presents basic statistical relationships between corporate taxes, investment, and entrepreneurship using two new data sets. The first data set computes effective 1st year and 5-year corporate income tax rates for 85 countries, using a survey of PricewaterhouseCoopers local offices. The second data set, collected from national statistical offices, presents official registration rates by new firms in 62 countries.

We use these data sets, as well as additional publicly available data, to present cross-country evidence that effective corporate tax rates have a large and significant adverse effect on corporate investment and entrepreneurship. This effect is robust if we control for other tax rates, including personal income taxes and the VAT, for measures of tax compliance, for property rights protection, regulations, or economic development, for openness to foreign trade, and for inflation. Higher effective corporate income taxes are also associated with a larger size of the informal sector, greater reliance on debt as opposed to equity finance, and slower economic growth.

These results move forward the growing body of research suggesting that government regulatory and tax policies may have large consequences for the business

environment, as well as for economic development. It should give some comfort to those interested in development that not only deep historical, institutional, and geographical factors, but also policies that can be altered without enormous difficulty, might have a large impact on economic progress.

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Table 1. Pre-tax financial statements

A - Information provided in the balance sheet

Assets

Category	*Multiplication Factor*	*Values for the U.S.*
Current Assets		
Net Cash	20	755,600
Inventory	35	1,322,300
Accounts Receivable	50	1,889,000
Fixed Assets (acquisition value)		
Land	30	1,133,400
Building	40	1,511,200
Machinery	60	2,266,800
Truck	5	188,900
Computers	5	188,900
Office Equipment	5	188,900
Total Assets	**250**	**9,445,000**

Liabilities

Category	*Multiplication Factor*	*Values for the U.S.*
Current Liabilities		
Short Term Debt	43	1,624,540
Accounts Payable – Trade	50	1,889,000
Long Term Liabilities		
Long Term Debt	55	2,077,900

Equity

Category	*Multiplication Factor*	*Values for the U.S.*
Paid-in Capital	102	3,853,560
Total Liabilities and Equity	**250**	**9,445,000**

B - Information provided in the profit and loss statement

Category	*Multiplication Factor*	*Values for the U.S.*
Sales	1050	39,699,000
Cost of Goods Sold	875	33,057,500
Yearly salaries for:		
Managers	9.00 (= 2.25 per manager * 4)	340,020
Assistants	10.00 (= 1.25 per assistant * 8)	377,800
Workers	48.00 (= 1.00 per worker * 48)	1,813,440
Administrative expenses	10	377,800
Advertising Expenses	10.5	396,690
Machinery Repair Expenses	3	113,340
Interest Expense	5.5	207,790

Table 2. Variable definitions

Variable name	Source	Definition
Statutory Corporate Tax Rate (%)	Authors' calculations	The tax rate for the highest bracket of all taxes on corporate income. If there are different corporate taxes (for instance federal, state and local) we take into account the deductibility of one or more of those taxes when computing the tax base for corporate income.
1st Year Effective Tax Rate (%)	Authors' calculations	The tax rate obtained by dividing the total corporate tax TaxpayerCo pays by its pretax earnings.
5-year Effective Tax Rate (%)	Authors' calculations	The tax rate obtained by dividing the present discounted value of total corporate tax TaxpayerCo pays by the present discounted value of its pretax earnings.
Labor Tax (%)	Authors' calculations	The sum of all labor-related taxes payable by TaxpayerCo, including payroll taxes, mandatory social security contributions, mandatory health insurance, mandatory unemployment insurance, worker's compensation insurance contributions and any local contributions that are proportional to payroll or number of employees. It is expressed as a percentage of pretax earnings.
Other taxes (%)	Authors' calculations	The sum of all taxes payable by TaxpayerCo where the statutory incidence is on the firm, other than corporate income tax and labor tax. It is the sum of all property tax, business license tax, financial transactions tax, turnover tax and asset and capital tax payable by TaxpayerCo. It is expressed as a percentage of pretax earnings.
VAT and Sales tax	Authors' calculations	The sum of all consumption tax rates payable or collected by TaxpayerCo, including value added tax rate, sales tax rate and turnover tax rate and any related surtaxes.
PIT top marginal rate	World Bank (World Development Indicators), PriceWaterhouseCoopers and IBFD	The tax rate for the highest bracket of tax on personal income. Only taxes at the national level are included.
Number of tax payments	World Bank (Doing Business data)	The tax payments indicator reflects the total number of taxes paid, the method of payment, the frequency of payment and the number of agencies involved for this standardized case during the second year of operation. It includes payments made by the company on consumption taxes, such as sales tax or value added tax.
Time to comply with taxes (in hours)	World Bank (Doing Business data)	Time is recorded in hours per year. The indicator measures the time to prepare, file and pay (or withhold) three major types of taxes: the corporate income tax, value added or sales tax and labor taxes, including payroll taxes and social security contributions.
Investment 2003-2005 as % of GDP	World Bank (World Development Indicators)	Gross fixed capital formation (formerly gross domestic fixed investment).
FDI 2003-2005 as % of GDP	World Bank (World Development Indicators)	Foreign direct investment are the net inflows of investment to acquire a lasting management interest (10 percent or more of voting stock) in an enterprise operating in an economy other than that of the investor.
Business density per 100 people (2003/4)	Authors' data, collected from business registries and courts	The number of businesses legally registered divided by working population (total population aged 15 to 64). Only businesses with more than one employee are included. The variable is scaled to measure the number of businesses per 100 people in the work force.
Average entry rate (%) 2000-2004	Authors' data, collected from business registries and courts	The average number of businesses that registered per year between 2000 and 2004. Only businesses with more than one employee are included.
Average growth rate 1996 to 2005 (%)	World Bank (World Development Indicators)	Annual average percentage growth rate of GDP at market prices based on constant local currency for the period 1996 to 2005.
Average growth rate 2001 to 2005 (%)	World Bank (World Development Indicators)	Annual average percentage growth rate of GDP at market prices based on constant local currency for the period 2001 to 2005.

Table 2. Variable definitions

Variable name	Source	Definition
Size of informal sector 2005-07	World Economic Forum (2005-06 and 2006-07)	Size of informal sector as a percentage of economic activity 2005-2007. Computed using the scale provided in sections 6.17 (WEF 2005) and 6.30 (WEF 2006), which report measures on informal sector activity.
Debt to Equity Ratio	IMF (International Financial Statistics Database)	Firm's debt as percentage of firm's equity averaged by country. This ratio is computed using IMF's Corporate Vulnerability Utility which uses firm level data from Datastream and Worldscope.
Procedures to start a business	World Bank (Doing Business data) Updates of Djankov et al. (2002)	This variable includes all procedures that are officially required for an entrepreneur to start up and formally operate an industrial or commercia business.
Employment rigidity index	World Bank (Doing Business data) Updates of Botero et al. (2004)	The average of three subindices: a difficulty of hiring index, a rigidity of hours index and a difficulty of firing index.
Average inflation (2000-2004)	World Bank (World Development Indicators)	Inflation as measured by the annual growth rate of the GDP implicit deflator shows the rate of price change in the economy as a whole, averaged over the period 2000-2004. The GDP implicit deflator is the ratio of GDP in current local currency to GDP in constant local currency. World Bank national accounts data, and OECD National Accounts data files.
GDP per capita	World Bank (World Development Indicators)	GDP per capita is gross domestic product divided by midyear population. Data are in constant U.S. dollars.
IEF Property Rights Index	The Heritage Foundation (Index of Economic Freedom)	Property rights is an assessment of the ability of individuals to accumulate private property, secured by clear laws that are fully enforced by the state.
EFW Freedom to Trade Internationally Index	The Fraser Institute (Economic Freedom of the World)	This index measures taxes on international trade, regulatory trade barriers, size of the trade sector relative to expected, black-market exchange rates, and international capital market controls.
Deviation from average inflation	World Bank (World Development Indicators)	Measured as the difference between the mean inflation rate and the inflation of each particular country.
Income group	World Bank (World Development Indicators)	Economies are divided according to 2004 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $905 or less; lower middle income, $906 - $3,595; upper middle income, $3,596 - $11,115; and high income, $11,116 or more.
Legal origin	La Porta et al (2008)	A dummy variable that identifies the legal origin of the Company law or Commercial Code of each country. The four origins are English, French, German, and Nordic.

Table 3. Averages by income group

Corporate tax rates

	High income	Upper middle income	T-test High vs. Upper middle income	Lower middle income	T-test High vs. Lower middle income	Low income	T-test High vs. Low	Grand Total
Obs.	27	19		21		18		85
Statutory Corporate Tax Rate	30.63	24.48	2.897 a	28.69	0.982	31.86	-0.651	29.04
1st Year Effective Tax Rate	18.08	13.53	2.421 b	19.05	-0.514	18.79	-0.366	17.45
5-year Effective Tax Rate	20.49	15.40	3.002 b	20.22	0.152	21.57	-0.636	19.51

Other tax rates

	High income	Upper middle income	T-test High vs. Upper middle income	Lower middle income	T-test High vs. Lower middle income	Low income	T-test High vs. Low	Grand Total	Obs
Labor Tax	14.67	18.05	-1.122	16.73	-0.710	10.69	1.479	15.09	85
Other Taxes	1.02	2.18	-1.545	2.20	-1.525	1.69	-1.397	1.71	85
VAT and Sales tax	15.56	17.91	-1.234	18.46	-0.982	16.98	-0.753	17.10	85
PIT top marginal rate	38.51	30.79	2.178 b	28.45	3.197 a	34.72	1.096	33.50	85

Tax administration

	High income	Upper middle income	T-test High vs. Upper middle income	Lower middle income	T-test High vs. Lower middle income	Low income	T-test High vs. Low	Grand Total
Number of tax payments	16	38	-4.625 a	48	-6.926 a	44	-6.911 a	35
Time to comply with taxes (in hours)	229	378	-2.275 b	640	-3.063 a	425	-2.526 b	406

Investment and entrepreneurship

	High income	Upper middle income	T-test High vs. Upper middle income	Lower middle income	T-test High vs. Lower middle income	Low income	T-test High vs. Low	Grand Total	Obs
Investment 2003-2005 as % of GDP	21.14	20.55	0.526	22.49	-1.005	21.67	-0.394	21.46	85
FDI 2003-2005 as % of GDP	3.03	3.94	-0.842	4.02	-0.927	2.45	0.527	3.36	84
Business density per 100 people (2003/4)	7.63	6.35	1.231	3.02	4.817 a	1.08	6.813 a	5.05	80
Average entry rate (%) 2000-2004	8.79	9.09	-0.281	7.34	1.279	6.41	2.141 b	8.11	62

Other dependent variables

	High income	Upper middle income	T-test High vs. Upper middle income	Lower middle income	T-test High vs. Lower middle income	Low income	T-test High vs. Low	Grand Total	Obs
Average growth rate 1996 to 2005 (%)	2.33	3.18	-1.867 c	3.30	-1.683 c	2.31	0.040	2.76	84
Average growth rate 2001 to 2005 (%)	1.68	3.75	-3.797 a	4.41	-3.854 a	2.58	-1.437	3.02	84
Size of informal sector 2005-07	18.02	27.36	-5.062 a	32.26	-9.146 a	35.78	-11.742 a	27.29	83
Debt to Equity Ratio	147.00	73.74	2.869 a	81.50	2.422 b	58.07	1.833 c	111.69	51

Table 4. Averages by legal origin

Corporate tax rates

Legal Origin	English	French	German	Nordic	Grand Total	T-test English vs. French
Obs	24	40	17	4	85	
Statutory Corporate Tax Rate	30.99	29.35	25.62	28.75	29.04	0.962
1st Year Effective Tax Rate	18.68	18.79	12.72	16.80	17.45	-0.064
5-year Effective Tax Rate	22.49	19.69	14.85	19.66	19.51	1.921 c

Other tax rates

Legal Origin	English	French	German	Nordic	Grand Total	Obs	T-test English vs. French
Labor Tax	7.43	17.83	19.62	14.44	15.09	85	-5.356 a
Other Taxes	1.55	2.25	0.95	0.55	1.71	85	-0.881
VAT and Sales tax	13.83	18.52	16.78	24.00	17.10	85	-2.101 b
PIT top marginal rate	33.54	32.74	35.44	32.55	33.50	85	0.284

Tax administration

Legal Origin	English	French	German	Nordic	Grand Total	T-test English vs. French
Number of tax payments	31	42	30	11	35	-1.809 c
Time to comply with taxes (in hours)	282	506	404	152	406	-1.984 c

Investment and entrepreneurship

Legal Origin	English	French	German	Nordic	Grand Total	Obs	T-test English vs. French
Investment 2003-2005 as % of GDP	21.18	20.45	24.96	18.30	21.46	85	0.681
FDI 2003-2005 as % of GDP	3.15	3.50	3.91	1.03	3.36	84	-0.417
Business density per 100 people (2003/4)	5.35	3.73	6.80	8.96	5.05	80	1.597
Average entry rate (%) 2000-2004	8.50	7.51	8.07	9.92	8.11	62	0.952

Other dependent variables

Legal Origin	English	French	German	Nordic	Grand Total	Obs	T-test English vs. French
Average growth rate 1996 to 2005 (%)	2.08	2.73	3.94	2.42	2.76	84	-1.336
Average growth rate 2001 to 2005 (%)	2.17	3.20	4.23	1.60	3.02	84	-1.500
Size of informal sector 2005-07	26.70	30.54	23.55	15.83	27.29	83	-1.666 c
Debt to Equity Ratio	97.14	130.83	109.97	75.66	111.69	51	-1.318

Table 5. Taxes, Investment and Entrepreneurship

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.072			-0.195		
	(0.076)			(0.046)***		
1st Year Effective Tax Rate		-0.218			-0.226	
		(0.074)***			(0.045)***	
5-year Effective Tax Rate			-0.243			-0.221
			(0.080)***			(0.050)***
Constant	23.547	25.265	26.199	9.044	7.302	7.681
	(2.274)***	(1.388)***	(1.628)***	(1.378)***	(0.847)***	(1.025)***
Observations	85	85	85	84	84	84
R-squared	0.01	0.09	0.1	0.18	0.23	0.19

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.153			-0.127		
	(0.063)**			(0.060)**		
1st Year Effective Tax Rate		-0.194			-0.138	
		(0.063)***			(0.057)**	
5-year Effective Tax Rate			-0.2			-0.138
			(0.067)***			(0.061)**
Constant	9.473	8.421	8.922	11.812	10.466	10.803
	(1.864)***	(1.164)***	(1.374)***	(1.790)***	(1.051)***	(1.260)***
Observations	80	80	80	62	62	62
R-squared	0.07	0.11	0.1	0.07	0.09	0.08

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5a. Other Taxes

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.045			-0.189		
	(0.074)			(0.047)***		
1st Year Effective Tax Rate		-0.165			-0.231	
		(0.079)**			(0.049)***	
5-year Effective Tax Rate			-0.188			-0.222
			(0.084)**			(0.054)***
Other Taxes	-0.479	-0.345	-0.341	-0.112	0.032	0.004
	(0.183)**	(0.191)*	(0.189)*	(0.114)	(0.119)	(0.121)
Constant	23.579	24.919	25.707	9.049	7.334	7.686
	(2.197)***	(1.383)***	(1.630)***	(1.378)***	(0.860)***	(1.046)***
Observations	85	85	85	84	84	84
R-squared	0.09	0.13	0.14	0.19	0.23	0.19

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.136			-0.123		
	(0.062)**			(0.060)**		
1st Year Effective Tax Rate		-0.162			-0.141	
		(0.067)**			(0.062)**	
5-year Effective Tax Rate			-0.164			-0.14
			(0.072)**			(0.067)**
Other Taxes	-0.313	-0.209	-0.224	-0.083	0.021	0.011
	(0.155)**	(0.165)	(0.164)	(0.136)	(0.146)	(0.147)
Constant	9.487	8.205	8.603	11.864	10.488	10.821
	(1.829)***	(1.172)***	(1.386)***	(1.802)***	(1.071)***	(1.294)***
Observations	80	80	80	62	62	62
R-squared	0.12	0.13	0.12	0.08	0.09	0.08

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5b. VAT and Sales Tax

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.071			-0.196		
	(0.076)			(0.045)***		
1st Year Effective Tax Rate		-0.226			-0.233	
		(0.074)***			(0.044)***	
5-year Effective Tax Rate			-0.267			-0.245
			(0.080)***			(0.049)***
VAT and Sales tax	-0.074	-0.087	-0.109	-0.069	-0.082	-0.101
	(0.062)	(0.060)	(0.060)*	(0.038)*	(0.036)**	(0.037)***
Constant	24.802	26.892	28.533	10.246	8.834	9.882
	(2.500)***	(1.769)***	(2.055)***	(1.508)***	(1.069)***	(1.275)***
Observations	85	85	85	84	84	84
R-squared	0.03	0.12	0.14	0.21	0.28	0.26

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.153			-0.133		
	(0.063)**			(0.061)**		
1st Year Effective Tax Rate		-0.196			-0.141	
		(0.063)***			(0.057)**	
5-year Effective Tax Rate			-0.208			-0.152
			(0.069)***			(0.063)**
VAT and Sales tax	-0.010	-0.022	-0.037	-0.051	-0.043	-0.069
	(0.051)	(0.050)	(0.051)	(0.072)	(0.070)	(0.072)
Constant	9.64	8.836	9.723	12.859	11.242	12.225
	(2.065)***	(1.502)***	(1.763)***	(2.315)***	(1.643)***	(1.953)***
Observations	80	80	80	62	62	62
R-squared	0.07	0.11	0.11	0.08	0.1	0.09

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5c. Personal Income Tax Top Marginal Rate

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.119			-0.175		
	(0.078)			(0.048)***		
1st Year Effective Tax Rate		-0.236			-0.215	
		(0.073)***			(0.045)***	
5-year Effective Tax Rate			-0.259			-0.211
			(0.078)***			(0.049)***
PIT top marginal rate	0.102	0.097	0.094	-0.044	-0.060	-0.063
	(0.047)**	(0.043)**	(0.043)**	(0.029)	(0.026)**	(0.027)**
Constant	21.512	22.332	23.337	9.902	9.116	9.587
	(2.415)***	(1.887)***	(2.060)***	(1.480)***	(1.150)***	(1.289)***
Observations	85	85	85	84	84	84
R-squared	0.06	0.15	0.15	0.2	0.28	0.24

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.165			-0.135		
	(0.066)**			(0.065)**		
1st Year Effective Tax Rate		-0.196			-0.138	
		(0.064)***			(0.058)**	
5-year Effective Tax Rate			-0.201			-0.136
			(0.068)***			(0.062)**
PIT top marginal rate	0.023	0.007	0.003	0.015	0.000	-0.006
	(0.041)	(0.038)	(0.038)	(0.042)	(0.039)	(0.039)
Constant	9.035	8.2	8.824	11.556	10.453	10.97
	(2.028)***	(1.637)***	(1.803)***	(1.940)***	(1.553)***	(1.717)***
Observations	80	80	80	62	62	62
R-squared	0.07	0.11	0.1	0.07	0.09	0.08

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5d. Log Number of Tax Payments

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.076			-0.194		
	(0.077)			(0.047)***		
1st Year Effective Tax Rate		-0.228			-0.226	
		(0.075)***			(0.046)***	
5-year Effective Tax Rate			-0.247			-0.22
			(0.080)***			(0.050)***
Log of number of tax payments	0.359	0.585	0.426	-0.093	0.031	-0.148
	(0.688)	(0.660)	(0.654)	(0.418)	(0.407)	(0.413)
Constant	22.48	23.499	24.858	9.322	7.208	8.147
	(3.066)***	(2.430)***	(2.628)***	(1.866)***	(1.496)***	(1.663)***
Observations	85	85	85	84	84	84
R-squared	0.01	0.1	0.11	0.18	0.23	0.19

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.133			-0.119		
	(0.058)**			(0.055)**		
1st Year Effective Tax Rate		-0.161			-0.121	
		(0.059)***			(0.053)**	
5-year Effective Tax Rate			-0.183			-0.135
			(0.062)***			(0.056)**
Log of number of tax payments	-2.005	-1.890	-2.010	-1.652	-1.589	-1.675
	(0.525)***	(0.523)***	(0.514)***	(0.471)***	(0.471)***	(0.467)***
Constant	15.495	14.065	15.216	16.915	15.296	16.139
	(2.334)***	(1.900)***	(2.045)***	(2.194)***	(1.728)***	(1.880)***
Observations	80	80	80	62	62	62
R-squared	0.22	0.24	0.25	0.23	0.24	0.24

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5e. Log GDP Per Capita in 2003

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.073			-0.195		
	(0.076)			(0.046)***		
1st Year Effective Tax Rate		-0.223			-0.225	
		(0.075)***			(0.046)***	
5-year Effective Tax Rate			-0.247			-0.221
			(0.080)***			(0.050)***
Log GDPpc 2003	-0.241	-0.296	-0.285	0.082	0.033	0.053
	(0.325)	(0.311)	(0.309)	(0.197)	(0.192)	(0.196)
Constant	25.534	27.735	28.581	8.372	7.026	7.241
	(3.516)***	(2.943)***	(3.053)***	(2.128)***	(1.811)***	(1.930)***
Observations	85	85	85	84	84	84
R-squared	0.02	0.1	0.11	0.18	0.23	0.19

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.16			-0.136		
	(0.051)***			(0.058)**		
1st Year Effective Tax Rate		-0.180			-0.140	
		(0.051)***			(0.055)**	
5-year Effective Tax Rate			-0.192			-0.139
			(0.055)***			(0.059)**
Log GDPpc 2003	1.476	1.427	1.444	0.556	0.527	0.520
	(0.230)***	(0.227)***	(0.227)***	(0.247)**	(0.244)**	(0.246)**
Constant	-2.465	-3.545	-3.093	7.451	6.113	6.489
	(2.398)	(2.126)*	(2.194)	(2.598)***	(2.264)***	(2.381)***
Observations	80	80	80	62	62	62
R-squared	0.39	0.41	0.41	0.14	0.16	0.14

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5f. IEF Property Rights Index

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.07			-0.195		
	(0.077)			(0.046)***		
1st Year Effective Tax Rate		-0.221			-0.227	
		(0.074)***			(0.046)***	
5-year Effective Tax Rate			-0.242			-0.221
			(0.080)***			(0.050)***
IEF Property Rights Index	-0.016	-0.020	-0.015	-0.001	-0.006	-0.002
	(0.022)	(0.021)	(0.021)	(0.014)	(0.013)	(0.014)
Constant	24.338	26.376	26.974	9.074	7.657	7.759
	(2.541)***	(1.847)***	(1.976)***	(1.540)***	(1.131)***	(1.245)***
Observations	85	85	85	84	84	84
R-squared	0.02	0.1	0.11	0.18	0.23	0.19

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.169			-0.138		
	(0.054)***			(0.057)**		
1st Year Effective Tax Rate		-0.181			-0.133	
		(0.055)***			(0.055)**	
5-year Effective Tax Rate			-0.212			-0.142
			(0.058)***			(0.059)**
IEF Property Rights Index	0.085	0.080	0.085	0.041	0.037	0.039
	(0.016)***	(0.016)***	(0.016)***	(0.017)**	(0.016)**	(0.016)**
Constant	5.244	3.795	4.492	9.769	8.277	8.62
	(1.801)***	(1.387)***	(1.447)***	(1.900)***	(1.411)***	(1.518)***
Observations	80	80	80	62	62	62
R-squared	0.32	0.32	0.34	0.16	0.16	0.16

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5g. Procedures to start a business

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.066			-0.197		
	(0.079)			(0.047)***		
1st Year Effective Tax Rate		-0.224			-0.226	
		(0.077)***			(0.047)***	
5-year Effective Tax Rate			-0.242			-0.219
			(0.081)***			(0.050)***
Procedures to start a business	0.023	0.091	0.050	-0.090	-0.053	-0.100
	(0.151)	(0.146)	(0.144)	(0.090)	(0.089)	(0.090)
Constant	23.202	24.548	25.753	9.882	7.752	8.532
	(2.557)***	(1.769)***	(2.014)***	(1.533)***	(1.075)***	(1.256)***
Observations	84	84	84	83	83	83
R-squared	0.01	0.09	0.1	0.2	0.24	0.21

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.126			-0.113		
	(0.060)**			(0.057)*		
1st Year Effective Tax Rate		-0.153			-0.110	
		(0.060)**			(0.055)*	
5-year Effective Tax Rate			-0.178			-0.123
			(0.063)***			(0.058)**
Procedures to start a business	-0.428	-0.400	-0.428	-0.321	-0.296	-0.319
	(0.117)***	(0.117)***	(0.114)***	(0.114)***	(0.116)**	(0.114)***
Constant	12.562	11.334	12.37	14.107	12.485	13.187
	(1.954)***	(1.393)***	(1.577)***	(1.882)***	(1.280)***	(1.467)***
Observations	79	79	79	62	62	62
R-squared	0.21	0.23	0.24	0.18	0.18	0.19

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5h. Employment rigidity index

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.072			-0.194		
	(0.076)			(0.045)***		
1st Year Effective Tax Rate		-0.217			-0.224	
		(0.075)***			(0.044)***	
5-year Effective Tax Rate			-0.257			-0.242
			(0.080)***			(0.048)***
Rigidity of employment	-0.022	-0.020	-0.035	-0.041	-0.040	-0.054
	(0.030)	(0.029)	(0.029)	(0.018)**	(0.017)**	(0.017)***
Constant	24.356	25.998	27.791	10.501	8.729	10.091
	(2.529)***	(1.734)***	(2.072)***	(1.485)***	(1.028)***	(1.241)***
Observations	85	85	85	84	84	84
R-squared	0.02	0.1	0.12	0.23	0.28	0.28

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.153			-0.136		
	(0.062)**			(0.058)**		
1st Year Effective Tax Rate		-0.192			-0.138	
		(0.062)***			(0.056)**	
5-year Effective Tax Rate			-0.22			-0.164
			(0.067)***			(0.060)***
Employment rigidity index	-0.039	-0.038	-0.051	-0.046	-0.042	-0.054
	(0.025)	(0.024)	(0.024)**	(0.023)*	(0.023)*	(0.023)**
Constant	10.923	9.767	11.203	13.712	11.936	13.205
	(2.058)***	(1.443)***	(1.726)***	(1.996)***	(1.315)***	(1.603)***
Observations	80	80	80	62	62	62
R-squared	0.1	0.14	0.15	0.13	0.14	0.15

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5i. Average Inflation 2000-2004

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.066			-0.193		
	(0.076)			(0.046)***		
1st Year Effective Tax Rate		-0.220			-0.227	
		(0.074)***			(0.045)***	
5-year Effective Tax Rate			-0.24			-0.22
			(0.079)***			(0.050)***
Average inflation (2000-2004)	-0.030	-0.033	-0.030	-0.012	-0.016	-0.014
	(0.023)	(0.022)	(0.022)	(0.014)	(0.013)	(0.014)
Constant	23.659	25.587	26.406	9.093	7.464	7.778
	(2.265)***	(1.395)***	(1.628)***	(1.381)***	(0.856)***	(1.030)***
Observations	85	85	85	84	84	84
R-squared	0.03	0.12	0.12	0.19	0.25	0.2

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.143			-0.125		
	(0.060)**			(0.060)**		
1st Year Effective Tax Rate		-0.180			-0.139	
		(0.060)***			(0.057)**	
5-year Effective Tax Rate			-0.192			-0.136
			(0.065)***			(0.061)**
Average inflation (2000-2004)	-0.166	-0.160	-0.167	-0.015	-0.017	-0.015
	(0.059)***	(0.058)***	(0.058)***	(0.016)	(0.016)	(0.016)
Constant	10.24	9.208	9.857	11.889	10.651	10.912
	(1.808)***	(1.154)***	(1.352)***	(1.794)***	(1.063)***	(1.266)***
Observations	80	80	80	62	62	62
R-squared	0.16	0.19	0.19	0.08	0.11	0.09

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 5j. EFW Freedom to Trade Internationally Index

Panel A - Investment

	(1)	(2)	(3)	(4)	(5)	(6)
	Investment 2003-05			**FDI 2003-05**		
Statutory Corporate Tax Rate	-0.076			-0.144		
	(0.085)			(0.049)***		
1st Year Effective Tax Rate		-0.235			-0.189	
		(0.079)***			(0.046)***	
5-year Effective Tax Rate			-0.269			-0.174
			(0.085)***			(0.052)***
EFW Freedom to Trade Internationally Index	0.483	0.171	0.126	0.690	0.620	0.673
	(0.603)	(0.568)	(0.566)	(0.352)*	(0.334)*	(0.344)*
Constant	20.326	24.447	25.945	2.519	2.126	1.87
	(5.641)***	(4.686)***	(4.844)***	(3.286)	(2.747)	(2.938)
Observations	81	81	81	80	80	80
R-squared	0.03	0.12	0.13	0.19	0.26	0.21

Panel A - Entrepreneurship

	(1)	(2)	(3)	(4)	(5)	(6)
	Business Density			**Average entry rate 2000-04**		
Statutory Corporate Tax Rate	-0.043			-0.101		
	(0.061)			(0.057)*		
1st Year Effective Tax Rate		-0.090			-0.114	
		(0.059)			(0.053)**	
5-year Effective Tax Rate			-0.096			-0.108
			(0.064)			(0.058)*
EFW Freedom to Trade Internationally Index	2.653	2.513	2.531	1.153	1.132	1.137
	(0.509)***	(0.504)***	(0.500)***	(0.408)***	(0.401)***	(0.408)***
Constant	-12.806	-11.484	-11.307	2.603	1.759	1.898
	(4.627)***	(4.149)***	(4.214)***	(3.820)	(3.310)	(3.503)
Observations	76	76	76	60	60	60
R-squared	0.32	0.34	0.34	0.21	0.23	0.22

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 6. Other outcomes

Panel A - Growth

	(1)	(2)	(3)	(4)	(5)	(6)
	Average growth rate 1996 to 2005 (%) [1]			**Average growth rate 2001 to 2005 (%) [2]**		
Statutory Corporate Tax Rate	-0.093			-0.119		
	(0.026)***			(0.033)***		
1st Year Effective Tax Rate		-0.071			-0.108	
		(0.029)**			(0.036)***	
5-year Effective Tax Rate			-0.092			-0.129
			(0.031)***			(0.038)***
Initial Log GDPpc	-0.574	-0.627	-0.58	-1.007	-1.06	-1.003
	(0.136)***	(0.140)***	(0.139)***	(0.173)***	(0.176)***	(0.175)***
Constant	11.096	10.094	10.242	15.972	14.856	14.937
	(1.280)***	(1.265)***	(1.242)***	(1.654)***	(1.606)***	(1.579)***
Observations	84	84	84	84	84	84
R-squared	0.44	0.39	0.41	0.51	0.48	0.5

(1) controls for initial level of income per capita (1996), deviation from average inflation, plus 3 regional dummies (Africa, East Asia and Latin America).

(2) controls for initial level of income per capita (2001), deviation from average inflation, plus 3 regional dummies (Africa, East Asia and Latin America).

Panel B - Other outcomes

	(1)	(2)	(3)	(4)	(5)	(6)
	Size of informal sector 2005-07			**Debt to Equity Ratio**		
Statutory Corporate Tax Rate	0.166			4.698		
	(0.089)*			(1.374)***		
1st Year Effective Tax Rate		0.186			4.526	
		(0.089)**			(1.498)***	
5-year Effective Tax Rate			0.187			3.068
			(0.096)*			(1.719)*
Log GDPpc 2003	-4.405	-4.370	-4.381	25.028	25.594	24.028
	(0.372)***	(0.370)***	(0.372)***	(6.617)***	(6.777)***	(7.139)***
Constant	58.09	59.413	59.082	-254.472	-196.693	-162.932
	(4.045)***	(3.503)***	(3.669)***	(74.207)***	(68.244)***	(72.621)**
Observations	83	83	83	51	51	51
R-squared	0.64	0.65	0.64	0.34	0.31	0.23

Standard errors in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Figure 1

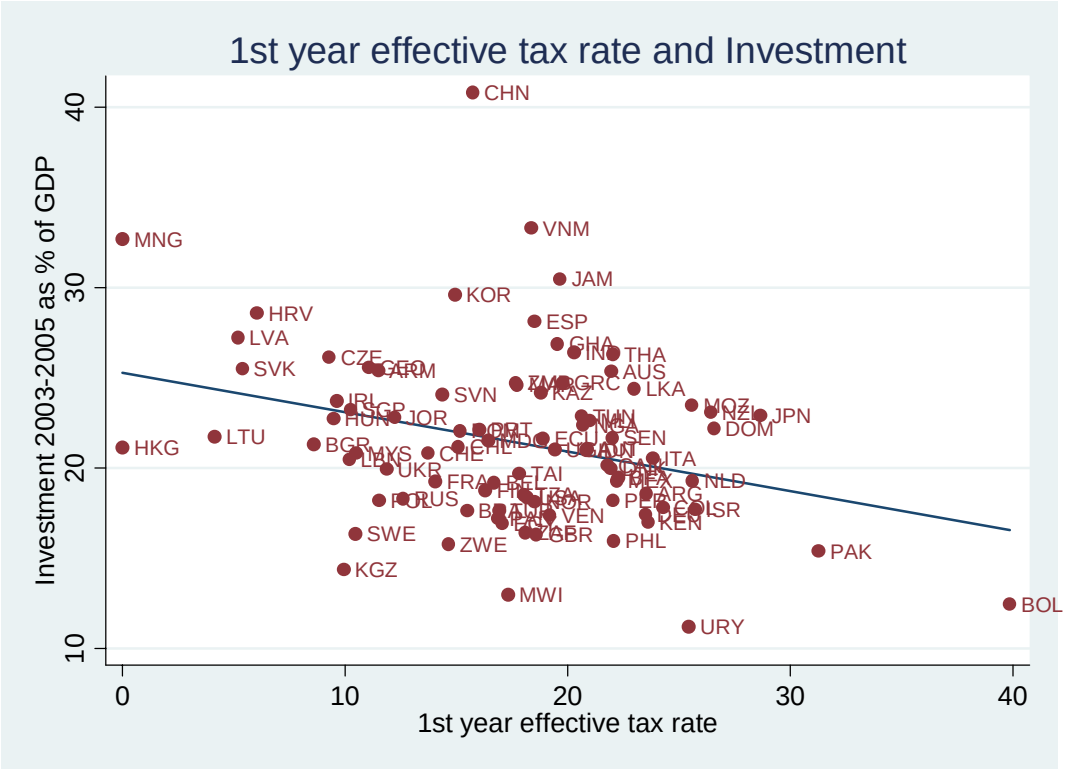


Figure 2

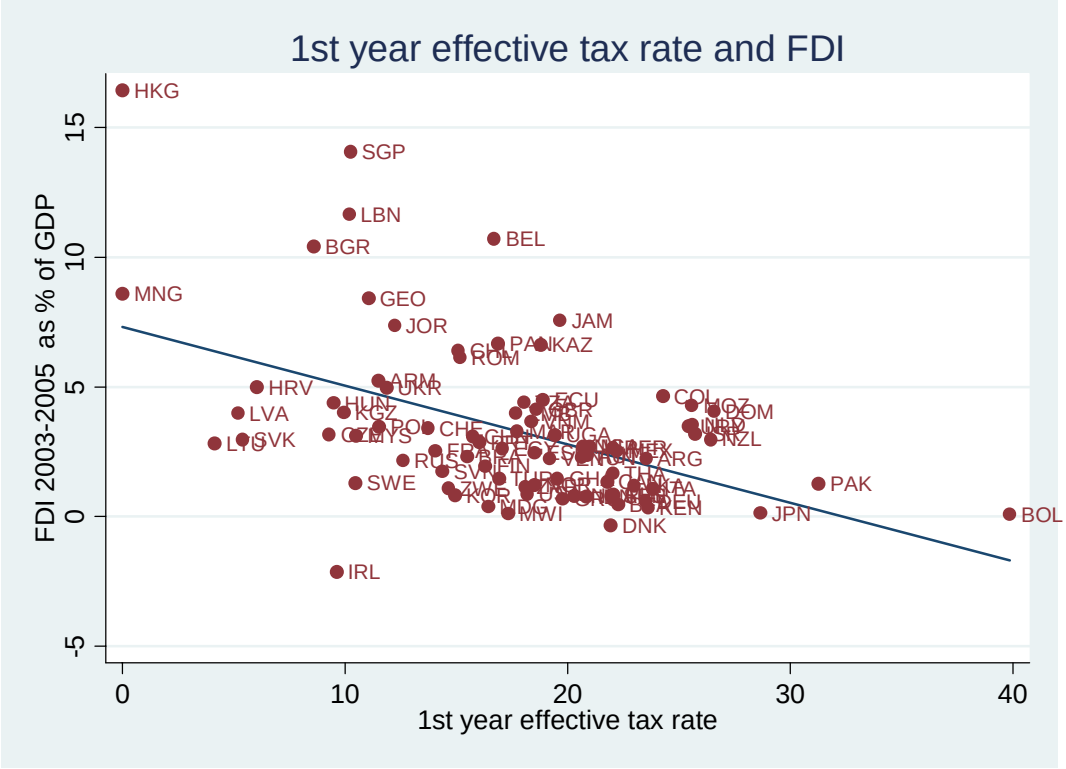


Figure 3

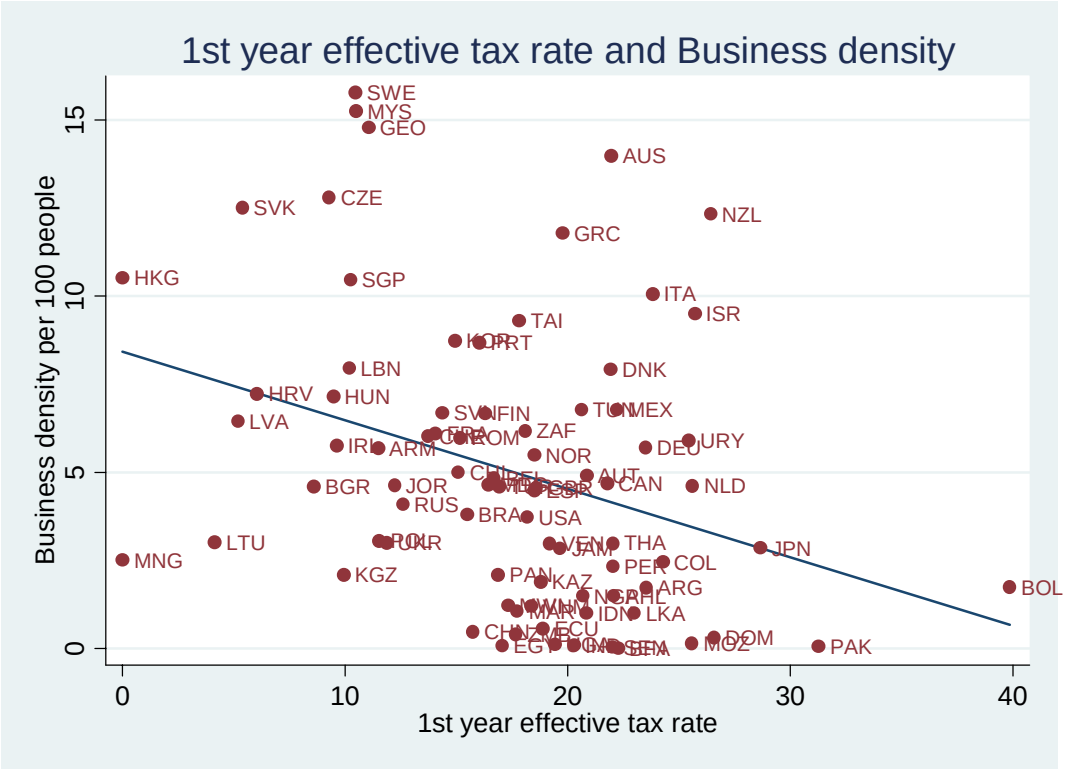


Figure 4

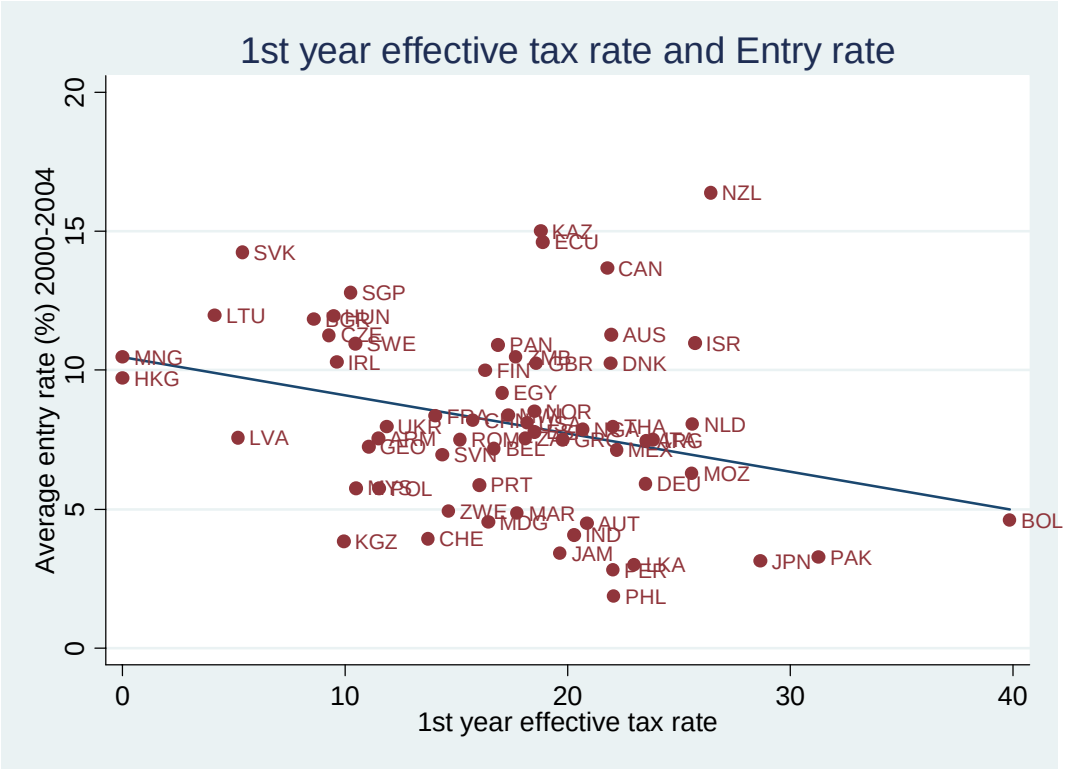


Figure 5

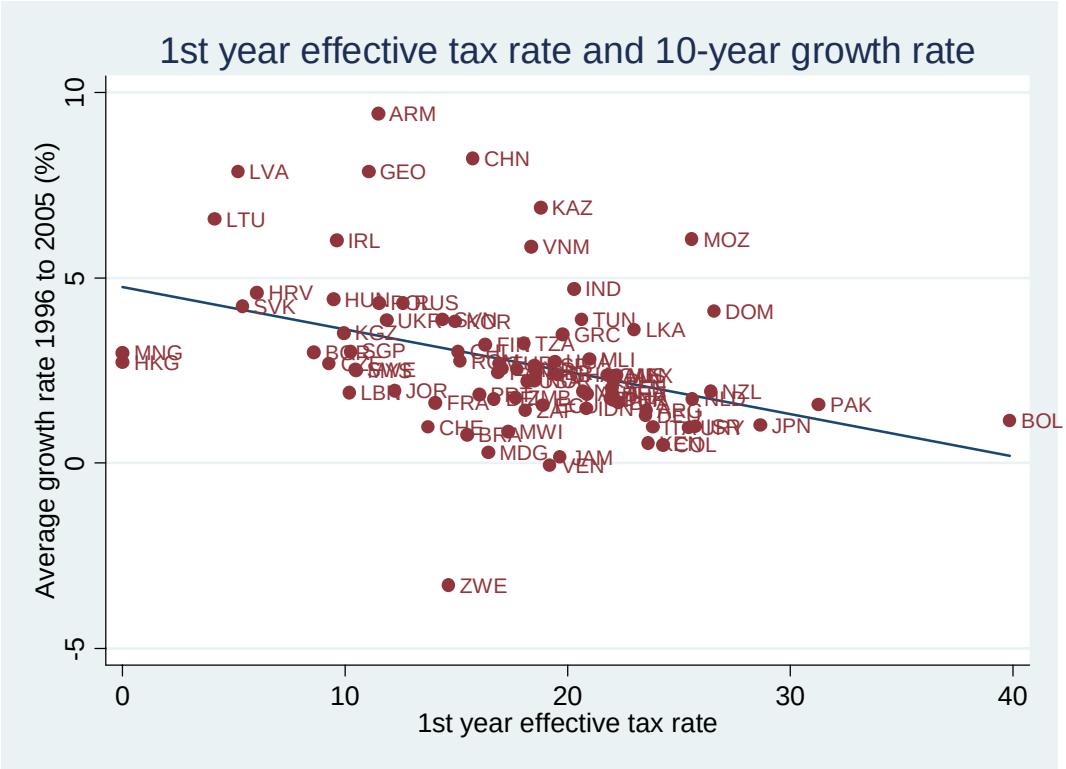


Figure 6

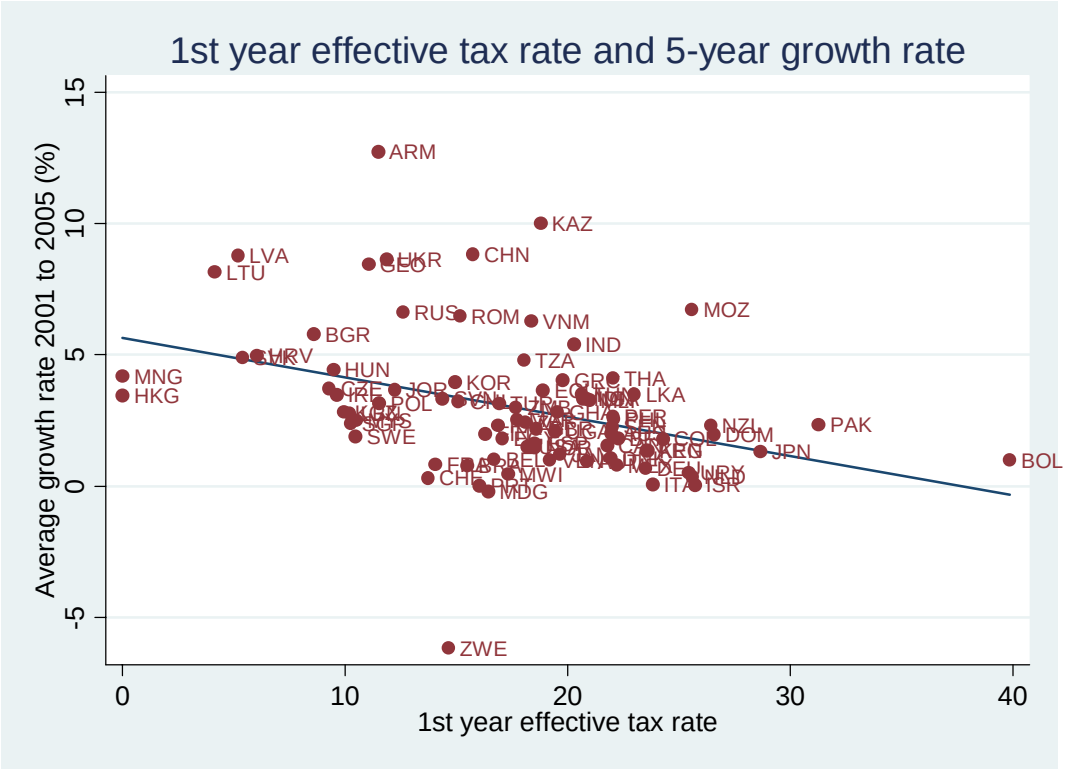


Figure 7

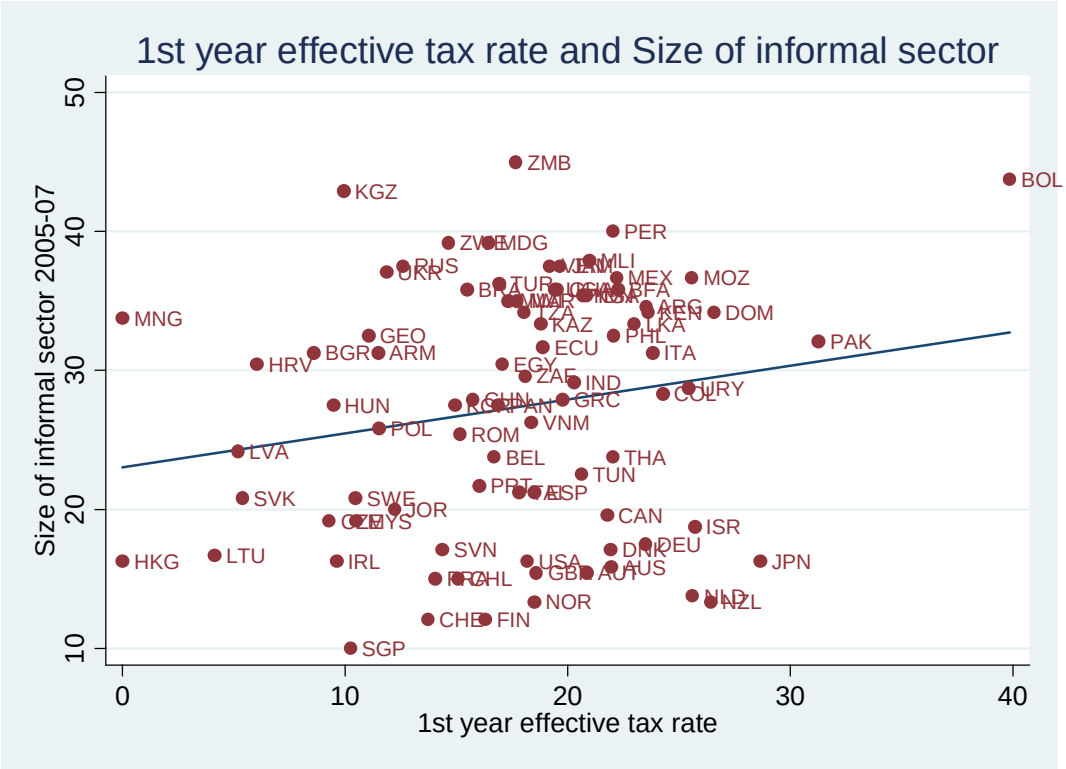
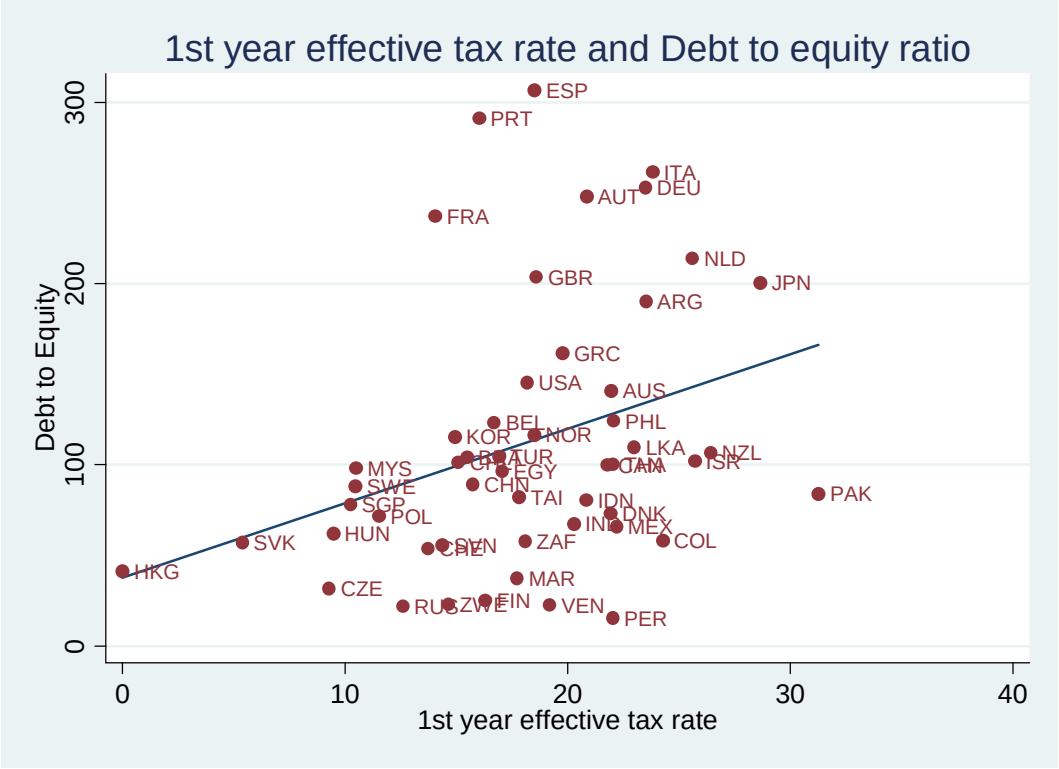


Figure 8



APPENDIX A

Using the example of Argentina, the following is a description of how we obtained the tax measures "1st year effective corporate tax rate" and "5 year effective corporate tax rate".

The statutory corporate income tax rate in Argentina is a single rate of 35%. The Social Security Contributions paid by the employer are 23% total. The tax base for the Social Security Contributions is the employee's gross salary with a ceiling (which is not binding for TaxpayerCo.) The Social Security Contributions are deductible from the tax base for the corporate income tax. Depreciation rates are as follows: Land – not depreciable; Building – 2% straight-line; Machinery – 10% straight-line; Truck – 20% straight-line; Computers – 33.33% straight-line; Office Equipment – 20% straight-line. Advertising, interest, and machinery repair expenses are deductible in the tax base for the corporate income tax.

We calculate the Labor Tax liability of TaxpayerCo as shown in Table A:

Table A – Labor Tax Calculations

Managers:		
Total annual salaries for the 4 managers	9*GNI per capita =	95,808
Monthly salaries	95,808/(12*4) =	1,996
Monthly Soc. Sec. Contr.	23%*1,996 =	459
Yearly Soc. Sec. Contr. per manager	12*459 =	5,509
Total annual Soc. Sec. Contr. for the 4 managers	4*5,509 =	22,036
Assistants:		
Total annual salaries for the 8 assistants	10*GNI per capita =	106,453
Monthly salaries	106,453/(12*8) =	1,109
Monthly Soc. Sec. Contr.	23%*1,109 =	255
Yearly Soc. Sec. Contr. per manager	12*255 =	3,061
Total annual Soc. Sec. Contr. for the 8 assistants	8*3,061 =	24,484
Workers:		
Total annual salaries for the 48 workers	48*GNI per capita =	510,975
Monthly salaries	510,975/(12*48) =	887
Monthly Soc. Sec. Contr.	23%*887 =	204
Yearly Soc. Sec. Contr. per manager	12*204 =	2,448
Total annual Soc. Sec. Contr. for the 48 workers	48*2,448 =	117,524
Total annual Social Security Contributions paid by TaxpayerCo.		164,044

The depreciation allowances for the first five years are calculated as shown in Table B:

Table B – Calculation of Depreciation Allowances

	Year 1	Year 2	Year 3	Year 4	Year 5
Building (40*GNI per capita)	425,812	417,296	408,780	400,264	391,747
Annual Depreciation (2% straight line)	8,516	8,516	8,516	8,516	8,516
Net Property	417,296	408,780	400,264	391,747	383,231
Machinery (60*GNI per capita)	638,719	574,847	510,975	447,103	383,231
Annual Depreciation (10% straight line)	63,872	63,872	63,872	63,872	63,872
Net Machinery	574,847	510,975	447,103	383,231	319,359
Truck (5*GNI per capita)	53,227	42,581	31,936	21,291	10,645
Annual Depreciation (20% straight line)	10,645	10,645	10,645	10,645	10,645
Net Machinery	42,581	31,936	21,291	10,645	-
Computers (5*GNI per capita)	53,227	35,484	17,742	-	-
Annual Depreciation (33.33% straight line)	17,742	17,742	17,742		
Net Machinery	35,484	17,742	-		
Office Equipment (5*GNI per capita)	53,227	42,581	31,936	21,291	10,645
Annual Depreciation (20% straight line)	10,645	10,645	10,645	10,645	10,645
Net Machinery	42,581	31,936	21,291	10,645	-
Total Depreciation Allowance	**111,421**	**111,421**	**111,421**	**93,679**	**93,679**

The Labor Tax liability, which as stated above is deductible in the Corporate Income Tax base, and the Depreciation Allowance are then used in the calculation of the Corporate Income Tax liability, which we calculate as shown in Table C:

Table C – Income Statement

	Year 1	Year 2	Year 3	Year 4	Year 5
Sales (=1050*GNI p.c.)	11,177,578	11,177,578	11,177,578	11,177,578	11,177,578
Cost of Goods Sold (=875*GNI p.c.)	9,314,648	9,314,648	9,314,648	9,314,648	9,314,648
Operating Expenses (=77*GNI p.c.)	819,689	819,689	819,689	819,689	819,689
Labor Taxes (as calculated above)	164,044	164,044	164,044	164,044	164,044
Other Possible Deductions (i.e. advertising expenses at 10.5 GNI p.c. and machinery repair expenses at 4*GNI p.c.)	143,712	143,712	143,712	143,712	143,712
EBITDA	735,485	735,485	735,485	735,485	735,485
Depreciation and Amortization (as calculated above)	111,421	111,421	111,421	93,679	93,679
EBIT	624,064	624,064	624,064	641,806	641,806
Interest Expense (=5.5*GNI p.c.)	58,549	58,549	58,549	58,549	58,549
Earnings before Taxes	565,514	565,514	565,514	583,257	583,257
Income Tax	**197,930**	**197,930**	**197,930**	**204,140**	**204,140**

Net Income	367,584	367,584	367,584	379,117	379,117
PDV of Income Tax (at an 8% discount rate)	**197,930**	**183,269**	**169,693**	**162,053**	**150,049**

With this information the 1st year effective corporate tax rate and the 5-year effective corporate tax rate are calculated as follows:

- The 1st year effective corporate tax rate is simply the Year 1 income tax liability divided by the denominator (i.e. 79 times GNI per capita), which in Argentina's case works out to be (197,930/840,980 =) 23.54%.
- The 5-year effective corporate tax rate is simply the sum of the present-discounted values of the income tax liability in years 1 to 5 divided by sum of the present-discounted values of the denominator in years 1 to 5 (which does not change in absolute terms but does change in PDV terms). In Argentina's case, this works out to be (862,993/3,626,411 =) 23.80%.